Academic Governance

The University of Texas at Dallas
800 West Campbell Road, AD 23, Richardson, TX 75080-3021
(972) 883-6715 FAX (972) 883-2276

MEMORANDUM
November 24, 2009

TO: Academic Council*

COPY TO: **David Daniel**
Hobson Wildenthal
Andrew Blanchard
Calvin Jamison
John Wiorkowski
Brian Berry
Michael Coleman
Austin Cunningham
George Fair
Serenity King
Abby Kratz
Dennis Kratz
James Marquart
Bert Moore
Hasan Pirkul
Myron Salamon
Mark Spong

FROM: Office of Academic Governance
Julie Allen, Academic Governance Secretary

SUBJECT: Academic Council Meeting

The Academic Council will meet on Wednesday, December 2, 2009 at 2:00 p.m. in the Osborne Conference Room **(ECS South 3.503)**. Please bring the agenda packet with you to the meeting. If you cannot attend, please notify me at tkbrown@utdallas.edu or x6715.

Attachments

2009-2010 Academic Council
Beron, Kurt
Cantrell, Cyrus
Cordell, David **
Huxtable-Jester, Karen
Kieschnick, Robert
Leaf, Murray *
Miller, Dennis
Redman, Timothy
Kao, Diana – Student Government President

*Speaker
**Secretary

Academic Governance

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AGENDA

ACADEMIC COUNCIL MEETING
December 2, 2009

1.	CALL TO ORDER, ANNOUNCEMENTS & QUESTIONS	DR. DANIEL
2.	APPROVAL OF THE AGENDA	DR. LEAF
3.	APPROVAL OF MINUTES November 4, 2009 Meeting	DR. LEAF
4.	SPEAKER'S REPORT	DR. LEAF
5.	FAC REPORT	DR. LEAF
6.	DRAFT - CHARGE FOR THE STRATEGIC PLANNING ADVISORY COMMITTEE & APPOINTING INITIAL MEMBERS	DR. LEAF
7.	AUTHORIZING COUNCIL AGENDA COMMITTEE (To add items to January Senate Agenda)	DR. LEAF
8.	NEW POLICY_CAMPS & CLINICS	MS. KING
9.	ALCOHOLIC BEVERAGES POLICY	MS. KING
10.	PM-15 COMMITTEE ON PARKING AND TRANSPORTATION	MS. KING
11.	FITNESS FOR DUTY POLICY FOR FACULTY (Report from Committee on Faculty Standing and Conduct)	DR. LEAF
12.	GRADUATE CATALOG (first 40 pages from CEP)	DR. CANTRELL
13.	JANUARY SENATE AGENDA 1 Draft – Charge for the Strategic Planning Advisory Committee 2. New Policy_Camps & Clinics 3. Alcoholic Beverages Policy 4. PM-15 Committee on Parking and Transportation 5. Fitness for Duty Policy for Faculty 6. Graduate Catalog	DR. LEAF
14.	ADJOURNMENT	DR. DANIEL

UNAPPROVED AND UNCORRECTED MINUTES

These minutes are disseminated to provide timely information to the Academic Council. They have not been approved by the body in question, and, therefore, they are not official minutes.

Academic Council Meeting
November 4, 2009

PRESENT: Kurt Beron, Cy Cantrell, R. Chandrasekaran, David Cordell, Karen Huxtable-Jester, Murray Leaf, Dennis Miller, Tim Redman

VISITORS: President David Daniel, Hobson Wildenthal, Calvin Jamison, Serenity King, Diana Kao.

1. CALL TO ORDER, ANNOUNCEMENTS, and QUESTIONS.

Since President Daniel was delayed at his State of the University Address, Provost Wildenthal called the meeting to order. He had no announcements.

Dr. Redman asked about President Daniel's budget presentation at the forthcoming Senate meeting. Dr. Redman suggested expanding on the breakdown provided at his address to the campus community today as a way to distinguish broadly between direct academic expenditures and support. Specifically, President Daniel should be asked to include separately the budgets for the Vice President for Business Affairs and the Provost, and then additional major groupings expenditures that these two main categories will not include. The Council concurred. Speaker Leaf and Provost Wildenthal agreed to convey this to President Daniel.

President Daniel subsequently joined the meeting, but had to leave soon thereafter. The Council did, however, express satisfaction with his all-campus State of the University Address.

2. APPROVAL OF THE AGENDA

After agreeing to amend the agenda to move item 11, consideration of the resignation of Liz Salter from the Scholarship Committee, to the first position, Dr. Redman moved to approve the Council agenda. Dr. Cantrell seconded. The motion carried.

3. APPROVAL OF THE MINUTES

The minutes in the agenda packet were a preliminary draft. Dr. Cordell circulated the correct version. Dr. Cantrell offered a correction to the corrected version on page 3, changing the statement "the thresholds for determining what is a low-producing program are being lowered" to "levels for determining what is a low-producing program are being raised." Dr. Leaf accepted the correction. Dr. Redman moved to approve the minutes as corrected. Dr. Cantrell seconded. The motion carried.

4. SPEAKER'S REPORT.

Dr. Leaf indicated that he had nothing to report since all matters were on the agenda.

5. FACULTY ADVISORY COUNCIL REPORT

Dr. Leaf reported on developments regarding the UT System task force on a financial exigency policy. The members of the committee are Ricardo Romo (President of U T San Antonio), Pedro Reyes (Associate Vice Chancellor for Planning and Assessment at System and Liaison to Board of Regents), Daniel Sharphorn (OGC), Dan Formanowicz (Chair of the Faculty Senate at UT Arlington and Chair of the FAC), Steven Leslie (Executive Vice President and Provost, U T Austin), Ruth Levine (Professor of Clinical Psychiatry and Internal Medicine at UTMB), Kirk Calhoun (President, UTHSCT), Masters (UTHSCSA), Alba Ortiz (former Chair of the Faculty Council, UT Austin), and Raymond DuBois, (Provost and Executive Vice President at M. D. Anderson), and Dr. Leaf (Co-Chair of Governance Subcommittee of the FAC, which originated the FAC's view of the way Regent's Rules should have been implemented to deal with the exigency at UTMB).

After initial introductions and the orientation by Chancellor Cigarroa, the first and most important point that emerged was that there was no serious disagreement on the process that had been followed at UTMB. Administrators and faculty, campus level and System level, had the same information and had apparently also reached substantially the same view of what had gone wrong. Essentially, the problems fell into three areas. First there were some problems with the Regent's Rules themselves, in the sense that they did not readily apply to the organization and practices of medical campuses, and there important lacks of clarity in such basic notions as what should be construed as "faculty" for the required faculty committees. Second, the Rules had not actually been conscientiously imbedded in local procedures that had wide approval. And third, the policy and the practices seriously lacked transparency.

While the solution has to involve putting policies in place at the campus level as well as assuring that Regent's Rules are appropriate to the situation, the task force will focus only on Regents Rules, and avoid making them so specific as to micromanage what happens on the campuses. At the same time, the FAC is coordinating an effort to develop campus level policies, based on the FAC template (which closely follows our own initial draft). The template was accepted at the last FAC meeting by representatives of the academic campuses, but was considered not appropriate for the medical campuses. M D Anderson developed a modification that we have now taken as a second template for the medical campuses. They are now discussing and are due to report their reactions and recommendations at the FAC meeting in January.

The task force has designated a drafting subcommittee consisting of Dr. Leaf, Dr. Reyes, and Mr. Sharphorn. They will draft changes and the committee will discuss them by email, expecting one or two more full meetings before the changes final form.

We expect the two lines of development to converge after the FAC meeting. At that time, we will see if Regent's Rules will have to embody different wording for academic and medical campuses, or if it will be possible to develop one overall formula for both. We will definitely not have anything before then, but should have a fairly clear recommendation for Chancellor by spring.

Dr. Redman reminded Dr. Leaf of the report on the UTMB situation by Leroy Dubeck, of Temple University, for the AAUP and TFA, and urged that he read it. Dr. Leaf promised to do so.

6. DECEMBER COUNCIL AND SENATE MEETINGS.

There was discussion about scheduling of Council and Senate meetings in December and January. Dr. Redman moved to have a Council meeting in December, but not January, and to have a Senate meeting in January, but not December. Dr. Cantrell seconded the motion and it passed. It was noted that the January Senate agenda should allow for items to be submitted from the CEP that are approved after the December Council meeting.

7. CONSIDERATION OF THE RECOMMENDATION OF DR. SALTER FROM THE SCHOLARSHIP COMMITTEE, AND APPOINTMENT OF TRACY ROCKETT TO THAT COMMITTEE.

The Council expressed concern at Dr. Salter's letter of resignation from the Scholarship Committee, and concern was expressed about her reasons for resigning. It was noted that this situation is not appropriate for Senate consideration at this time, but the Council directed Speaker Leaf to speak to her further about the situation.

Dr. Leaf noted that Dr. Salter had recommended Dr. Rockett to succeed her as chair of the Scholarship Committee, and had been working with her with that in mind, but that the Committee on Committees declined to make the appointment as chair when it recognized that Dr. Rockett had not actually served on the committee previously. Accordingly, as a separate matter, Dr. Leaf called for a motion to ask the Senate to appoint Tracy Rockett as a member of the Scholarship Committee. Dr. Cantrell made the motion. Dr. Beron seconded. The motion carried.

8. FITNESS FOR DUTY POLICY.

The Committee on Faculty Standing and Conduct recommends separating the policy for staff from the policy for faculty. They will draft a policy for faculty. Speaker Leaf noted that, because faculty are no longer subject to the proposed policy, it is not a matter for Senate consideration.

9. APPROVAL OF CANDIDATES FOR GRADUATION.

We have the list of candidates for graduation at the end of the Fall term. Dr. Cantrell moved to place approval of candidates for graduation on the Senate agenda. Dr. Redman seconded. The motion carried. There was subsequent discussion about a situation in which a student who was expelled for a second cheating violation, but may be listed as a candidate for graduation. Council directed Speaker Leaf to advise Dean Cunningham that the Senate would not approve a list of candidates that included such an individual.

10. APPOINTMENT OF DANIEL BOCHSLER TO THE LEARNING MANAGEMENT SYSTEMS COMMITTTEE.

Rhonda Blackburn has asked that the Senate appoint Daniel Bochsler to the Learning Management Systems Committee. Dinesh Bhatia, as chair, concurs with the recommendation. Mr. Bochsler is a Senior Lecturer in SOM. His vita describes him as "teaching undergraduate and graduate courses in Entrepreneurship, Technology, Strategic Management, and Organizational Behavior.

He also supports the activities of the Institute for Innovation & Entrepreneurship at UTD promoting cross-disciplinary academic and outreach programs across the university, community, and region to enhance business and economic growth and performance." He has a BSc in Computer Science from Oregon State as well his MBA, and has already been meeting with the committee.

Dr. Redman moved to place the appointment of Dr. Bochlser to the Learning Management Systems Committee on the Senate agenda. Dr. Huxtable-Jester seconded. The motion carried.

11. APPOINTMENT OF LEONIDAS BLERIS TO THE INSTITUTIONAL ANIMAL CARE COMMITTEE.

Stephen Spiro is unable to serve on the Institutional Animal Care Committee. Sanaz Okhovat and Juan Gonzalez recommend Leonidas Bleris (Assistant Professor in Electrical Engineering) as a replacement. Dr. Leaf noted that his field is "synthetic systems and biological research laboratory", so the appointment is especially appropriate. The Committee on Committees recommends the appointment, and further recommends that President Daniel make the appointment without waiting for Senate approval. This is within the bylaws since this is a University Committee not a Senate Committee, and the committee must be formed before it can issue approvals.

Dr. Leaf called for a motion to approve the appointment of Dr. Bleris to the Institutional Animal Care Committee and recommend that the President make the appointment immediately. We will ask the Senate to concur with the action. Dr. Cantrell made the motion. Dr. Redman seconded. The motion passed.

12. POSSIBLE DISCUSSION WITH JIM GARY.

Dr. Leaf asked the Council if we should invite Jim Gary back to the Senate to discuss the problems with submission of midterm grades and related matters, as the Senate had suggested (informally) at the end of the last meeting. After discussion, the Council agreed that nothing would be helped by inviting Gary for the November meeting. There was also general agreement that final grades for fall 2009 should be submitted through Orion rather than changing to anther system.

Dr. Redman moved to invite Jim Gary to the January Senate meeting discuss the implementation of the software for grade submission. Dr, Cantrell seconded. The motion carried.

13. AMEND THE CHARGE OF THE SAFETY AND SECURITY COUNCIL TO INCLUDE THE CHAIR OF THE COMPLIANCE SUBCOMMITTEE AS AN EX-OFFICIO MEMBER.

This has been requested by the Chair of the Compliance Subcommittee. Dr. Cantrell moved to place the amendment on the Senate agenda. Dr. Chandrasekaran seconded. The motion carried.

14. SENATE STRATEGIC PLANNING COMMITTEE PRELIMINARY DRAFT.

The Council agreed that discussion the Strategic Planning Committee report was important, although the draft was very preliminary and would require much more extensive discussion with concerned components of the university. Several members indicated that they had changes in wording to suggest. Dr. Leaf urged all members to communicate such changes to him. Dr. Chandrasekaran moved that this be placed on the Senate agenda for discussion. Dr. Redman seconded. The motion carried.

15. FROM CEP: UNDERGRADUATE CATALOG COPY.
Dr. Cantrell moved to place the proposed changes in wording regarding drops while on scholastic probation and computation of grades for repeated course work on the Senate agenda. Dr. Beron seconded. The motion carried.

16. POLICY ON CAMPS AND CLINICS.
The HOP committee has forwarded to the Senate a new policy on Camps and Clinics concerning criminal background checks and insurance coverage that was originated in the Office of Risk Assessment. Serenity King described the background and asked for approval. Dr. Cantrell moved to place the proposal on the Senate agenda. Dr. Huxtable-Jester seconded. The motion carried.

17. ALCOHOLIC BEVERAGE POLICY.
The HOP committee has forwarded to the Senate a revision to the policy regarding serving alcoholic beverages in private homes of university personnel when the university is to be asked for reimbursement of the cost of the beverages. It was also noted that a new form was being proposed for permission to serve alcohol. These proposals also originated in the Office of Risk Assessment. Serenity King described the background and asked for approval. Dr. Cantrell moved to place the proposed policy on the Senate agenda. Dr. Beron seconded. The motion carried.

18. REVISION OF PM-15, CHARGE TO THE COMMITTEE ON PARKING AND TRANSPORTATION.
This is also from the HOP committee at Dr. Jamison's request. Serenity King explained that the revisions reflect the appointment of a Parking and Transportation Manager and related administrative changes. The faculty representation and role is unchanged. Dr. Cantrell moved to place the amendments on the Senate agenda. Dr. Beron seconded. The motion carried.

19. APPROVAL OF SENATE AGENDA
The agenda for the Senate meeting thus is:

1. President's report on budget.
2. Approval for Candidates for Graduation.
3. Appointment of Daniel Bochsler to Learning Management Systems Committee
4. Approve recommended appointment of Leonidas Bleris to Institutional Animal Care Committee.
5. Appoint Tracy Rockett to Scholarship Committee.
6. Add chair of Compliance Committee to University Safety and Security Council ex officio.
7. Discuss draft of charge to Senate Strategic Planning Committee
8. CEP: Catalog changes.
9. New policy on camps and clinics.
10.
11. Alcoholic beverages policy.
12. Amendments to charge of Committee on Transportation and Parking.

Dr. Beron moved to approve the agenda. Dr. Cantrell seconded. The motion carried.

20. ADJOURNMENT. Provost Wildenthal adjourned the meeting.

APPROVED: _____ DATE: _____

Murray J. Leaf
Speaker of the Faculty

Item #6

CHARGE: COMMITTEE ON LONG TERM STRATEGIC PLANNING PRIORITIES.

The Committee on Strategic Planning is a standing, concurrent committee of the Academic Senate of The University of Texas at Dallas.

The purpose of the Committee is to advise the President and the Academic Senate on the best ways to coordinate and adjust the strategic plans of the University and the several schools. The aim of the coordination is to achieve the most effective and productive overall path of development into a major national research university while retaining the distinctive features of our intellectual and scientific program and organization that have served us well up to now. This includes an explicit and strong commitment to work cooperatively across disciplinary lines in the interest of the creating the most effective possible educational environment for our students, supporting the most important and productive research possible, and most effectively serving the needs of our region and the world. Such planning must avoid zero sum choices and seek instead the greatest possible synergy, both across the campus and over time. In this framework, the Committee should, therefore, carefully consider the order in which we take up the programs of the several schools, the priorities we assign them at any point in time, and the possibilities of alternative programs that migt be suggested to yield greater benefits.

Membership shall be flexible. Maximum appointed membership shall be 15. Terms shall be two years, staggered, and renewable. The Senate shall seek to appoint faculty representing the major research and teaching areas that are represented in the strategic plans of the several schools, balanced by faculty knowledgable in the programs and activities already well developed, that need to be maintained. Ex officio members shall be the Vice President for Research, the Provost or his/her designee, the Chair of the IR Security and Planning Committee, and the Director of Development. All members, appointed and ex officio, shall be voting members. The chair shall be chosen from among the faculty members. Faculty members shall serve staggered two year terms.

The Committee may appoint additional members to itself for specific purposes without the need for Senate approval.

The committee develop and maintain a rolling two year set of priorities for implementing the university strategic plan in the way that will provide the greatest possible long term growth and strengthening in faculty size, effectiveness, and research productivity, and present this plan for discussion in Senate and in the administration, in the Spring term of each year as preparation for administrative and faculty action in the following year.

The ultimate goal is that within the next thirty years, or less, U T Dallas will become a university of national stature, among the ranks of the nation's best public and private graduate research universities. Insofar as the state of Texas supports this aim with matching funding and other incentives for more research and other relevant activities, the Committee's

recommendations should include considerations of how to make the best use of such opportunities.

The RUO shall be the President of the University or his/her appointee.

Item #8

RISK INSURANCE FOR CAMPS AND CLINICS INVOLVING MINORS POLICY

The University of Texas System Board of Regents' Rule 80601 states that "*…the terms of any insurance policies and surety bonds, other than life, disability and health insurance policies, for any UT System institution shall be negotiated by The University of Texas System Director of Risk Management."*

The University of Texas at Dallas considers all camps and clinics that involve minors, no matter the activity, to be high risk activities and **require** that the event coordinator to purchase of special risk accident and liability insurance via the UT System Camp Insurance Program. The insurance rates are very affordable and can be included in the participants' registration fees, if applicable.

The Tenants and Users' Liability Insurance Policy (TULIP) will be used for approved third parties to use UT Dallas facilities for camps/clinics if the third party is unable to provide its own liability policy naming UT System and UT Dallas as additional insured. The TULIP protects the third party facility user, UT System and UT Dallas against claims by additional third parties who may be injured or suffer property loss as a result of participating in a covered event. A UT Dallas employee must serve as event coordinator for any third party.

When planning a camp or clinic, the **event coordinator** must complete the following steps:

1. Complete the *Special Events Risk Assessment* form.
2. Obtain the required signature approvals.
3. Submit the *Special Events Risk Assessment* form to the UTD Office of Risk Management. If the event involves a third party, the appropriate certificate of insurance must accompany the *Special Events Risk Assessment* form.
4. Complete and submit the *Camp Insurance Application* (sports or education) to the UT System contact. *See Camp Insurance Enrollment Instructions.* The application should include a best estimate of the anticipated number of participants.
5. Ensure that the appropriate procedures are followed to complete the payment process.
6. The UT System contact will inform the UT Dallas Office of Risk Management that the required insurance purchase has been made. Subsequently, the *Special Events Risk Assessment* form will be approved by the UT Dallas Office or Risk Management and returned to the event coordinator. *Note: The Special Events Risk Assessment form will not be approved if the insurance requirement is not met.*
7. Conduct a criminal background check for each camp/clinic staff member who is not employed by UT Dallas through the University Police Department. This requirement includes all volunteers. Note: Persons whose background checks present questionable findings are not permitted to be associated with the camp.
8. Prior to the camp/clinic, obtain a completed copy of the applicable *Release and Indemnification Agreement, for Minors or Adults and the Medical Information and Release* form from all camp participants and staff members, including volunteers, who are not employed by UT Dallas. Copies of these forms are to be maintained by the camp/clinic event coordinator for two years subsequent to the final day of the camp.

9. If security and/or special parking are/is desired, then the event coordinator should contact the University Police Department and/or the Parking & Traffic Office.

Visit http://www.utdallas.edu/businessaffairs/risk/ to access the following information:

- *Special Events Risk Assessment Form* that includes the *Request for Permission to Serve Alcohol*
- *Special Events Risk Assessment Guidelines* that includes the *Release and Indemnification Agreements (Minor and Adults)*
- *Medical Information and Release* form
- *Sports Camp Insurance Application*
- *Education Camp Insurance Application*
- *Camp Insurance Enrollment Instructions*
- *Frequently Asked Questions for Camps*

Item #8A

Request to: Create a new Camps and Clinics Policy to **require** sponsors to purchase liability insurance for camps/clinics that involve minors as participants. In addition to the insurance requirement, camp sponsors should also require all participants to complete the *Medical Information and Release* and the appropriate *Release and Indemnification Agreement.* Further, the responsible University sponsor/event coordinator is required to conduct a criminal background check on all persons who are not official UT Dallas employees who will be working with minors in a volunteer or paid status during the camp/clinic.

Person/group making request: Keshia Campbell, Director of Special Projects, Lean Initiatives and Risk Management

Responsible University Official: Dr. Calvin D. Jamison, Sr., Vice President for Business Affairs

Suggested Stakeholder Review Plan: *Academic Affairs, Student Affairs and Business Affairs*

Background Information/Rationale for request: UT Dallas is very vulnerable when certain camps and clinics involving minors take place on campus. UT System does an exceptional job vetting affordable liability coverage for camps and clinics. The University representative who makes decisions pertaining to risk issues associated with these events finds it very challenging to enforce sponsors of high risk events to purchase the additional liability insurance without having a policy in place to support the recommendation. Implementing a policy would assist the University with protecting its assets through the avoidance of potentially expensive legal issues that could arise in the event of an unfortunate incident.

With the growth of the University, there will be an increased amount of activities involving minors held on the campus. There is a need to screen the individuals who do not serve the University in an official capacity in an effort to protect the youth from possible harm.

Relevant documents:

- *Special Events Risk Assessment Form* including the *Request for Permission to Serve Alcohol Form*
- *Special Events Risk Assessment Guidelines* that includes the *Release and Indemnification Agreements (Minor and Adults)*
- *Medical Information and Release* form
- *Sports Camp Insurance Application*
- *Education Camp Insurance Application*
- *Camp Insurance Enrollment Instructions*
- *Frequently Asked Questions for Camps*

Item #9

ALCOHOLIC BEVERAGES POLICY

The Regents' *Rules and Regulations* provide that, with respect to the possession and consumption of alcoholic beverages, State law will be strictly enforced at all times on property controlled by The University of Texas System. Further, the rules prohibit the possession or consumption of alcoholic beverages in classroom buildings, laboratories, auditoriums, libraries, museums, faculty and administrative offices, intercollegiate and intramural athletic facilities and all other University property or buildings. However, the Regents' *Rules and Regulations* provide that regental rules (but not State law) may be waived at an event sponsored by the University with the prior consent of the institutional head for special occasions. See Regents' *Rules and Regulations*, Series 80102, Alcoholic Beverages.

The guidelines for the type of events for which an exception may be approved are defined as activities having a broad developmental focus; some examples are~~:~~ an advisory council dinner or a reception for a donor, an opening of a building or an art/museum exhibit, an alumni gathering, a community outreach function, or other developmental outreach-related event. Receptions held in conjunction with invited regional/national conferences and symposia hosted by the University, as well as events hosted in private homes with alcoholic beverages provided by the University, ~~-~~fall under these guidelines~~. as well.~~ The homeowner should possess liability insurance that will cover injuries that may be suffered by guests attending approved events.

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A written request for waiver of the Regents' *Rules and Regulations* concerning consumption of alcoholic beverages must be forwarded to the President's Designee, using the "Special Events Risk Assessment" form at http://www.utdallas.edu/forms/documents/SpecialEventsRiskAssessment.doc. All requests must be initiated by a Dean, Director or above. The written request must be delivered to the President's Designee no later than 10 business days prior to the scheduled event.
~~, the Associate Vice President for Business Affairs. The requests should be started with sufficient lead time so they reach the Designee's office at least one week prior to the requested event.~~

A ~~A~~ Responsible University Official ("RUO") must sponsor or co-sponsor the event and must agree to attend the entire function in order to receive approval for permission to serve alcohol at a special occasion. The RUO must be an employee who serves in a leadership capacity (~~i.e.~~e.g.~~,~~ Vice President, Director, Dean, Program Head, Faculty, etc.). State law, the Regents' *Rules and Regulations* (See Regents' *Rules and Regulations,* Series 80105, Joint Sponsorships~~.~~), and this policy will be enforced with regard to the possession and/or consumption of alcoholic beverages on campus. The alcohol must be served by a server/bartender~~, caterer~~ holding a valid TABC license~~. to serve alcohol.~~ No exceptions to these criteria will be made.

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Item #9

ALCOHOLIC BEVERAGES GUIDELINES AND LIMITATIONS

GUIDELINES AND LIMITATIONS

1. Food must be available at all functions where alcoholic beverages are served. If donated alcoholic beverages are to be served, the request must be accompanied by documentation from the donor~~, and food must be available~~.
2. An event is University-sponsored if a budgeted office, department, or division of the University is responsible for organizing the event, inviting attendees, and paying expenses related to the event~~, . Eeven if an outside entity pays for the food and beverages at the event, the event is considered University-sponsored when an office, department or division of the University plans or organizes the function~~.
3. ~~The "Request for Permission to Serve Alcoholic Beverages" form must be signed off by the individual who schedules the room reservation for the event.~~ ~~An approved copy of the~~The "Special Events Risk Assessment" form (Parts 1 and 2) must be completed. ~~and approved) must also be~~The approved form must accompany ~~attached to~~ the Purchase Voucher form for reimbursement of alcohol purchases.
4. Monitoring of compliance with this policy ~~and initial approval of alcoholic beverage requests~~ is the responsibility of the RUO.~~requesting official and the President's Designee.~~

Comment [KEM1]: This signature line is rarely completed when we receive it anyway. Has no bearing on the approval to serve alcohol, so it was decided to delete it as a "value add" point.

Item #9A

Request to: Revise the Alcoholic Beverages Policy in the Administrative Policies and Procedures Manual to conform to best practices.

Person/group making request: Keshia Campbell, Director of Special Projects, Lean Initiatives and Risk Management

Responsible University Official: Dr. Calvin D. Jamison, Vice President for Business Affairs

Suggested Stakeholders Review Plan: Faculty Senate, Staff Council and Business Affairs

Background Information/Rationale for request: To establish best practices in regards to Special Events wherein alcohol is being served.

Supporting Documents – The *Special Events Risk Assessment* and *Request for Permission to Serve Alcoholic Beverages* forms have been merged.

Rationale: There appears to be confusion regarding the necessity of completing the *Special Events Risk Assessment* form for events during which alcoholic beverages are being served. Currently, the approval process for hosting/sponsoring a Special Event and the approval to serve alcohol exists in two separate forms:

1. *Special Events Risk Assessment*
2. *Request for Permission to Serve Alcoholic Beverages*

The separation causes a disconnect in the completion, approval, and submission processes, i.e. it is suffice to submit the *Request for Permission to Serve Alcoholic Beverages* form ONLY, which is not the case.

POLICY MEMORANDUM 80-VI.57-39

Item #10

THE UNIVERSITY OF TEXAS AT DALLAS
POLICY MEMORANDUM 78-I.2-15

Issued: September 4, 1978
Revised: November 12, 1979
Revised: September 1, 1984
Revised: May 13, 1985
Revised: September 1, 1988
Revised: October 15, 1993
Editorial Amendments: October 29, 1998
Revised: December 3, 1999
Editorial Amendments: September 1, 2000
Editorial Amendments: April 10, 2006
Editorial Amendments: October 2, 2006
Revised: February 12, 2009
Editorial Amendments: September 28, 2009
Editorial Amendments: November xx, 2009

COMMITTEE ON PARKING AND TRANSPORTATION

The Committee on Parking and Transportation is a University-wide Standing Committee appointed by the President not reporting to the Academic Senate, The University of Texas at Dallas.

The Committee is charged to review all established and proposed university procedures and regulations regarding traffic control, parking, and transportation, and to make recommendations pertaining thereto. Recommendations regarding traffic, parking, and transportation policies shall be referred directly to appropriate administrative officers.

The Committee shall have six voting members and five~~four~~ non-voting members, ex officio. Two of the voting members shall be appointed from the membership of the General Faculty (as defined in Title III, Chapter 21, Section I.B.1. of The University of Texas at Dallas Handbook of Operating Procedures), one shall be appointed from the university staff, one from the Staff Council, and two shall be students. The ex officio members shall be the Parking and Transportation Manager~~Chief of Police~~, the Associate Vice President for Budget and Resource Planning, the Associate Vice President for Facilities Management or a designated representative, the Director of Disability Services, and the Safety Officer.

~~The Parking and Transportation Manager shall serve as the Chair (without vote) for this Committee.~~ The Vice President for Business Affairs shall serve as the Chair and the Responsible University Official for this Committee.

The term of office of the Committee members shall be for two years, effective September 1 to August 31, and members may be reappointed by the President for additional terms. If for any reason a Committee member resigns, the President shall appoint another individual to serve the remainder of the unexpired term.

Item #12

Doctor of Philosophy in Criminology

http://epps.utdallas.edu/crim/phd.html

Faculty

Professors: James W. Marquart (Director), Bruce Jacobs, John Worrall
Associate Professors: Thomislav Kovandzic, Lynne Vieraitis
Assistant Professors: Denise Paquette-Boots (Graduate Director), Karen Hayslett-McCall, Robert Morris,
Clinical Professor: Elmer Polk
Clinical Assistant Professors: Timothy Bray, Sarah Maxwell

Mission

The Mission of the Doctor of Philosophy in Criminology at the University of Texas at Dallas is threefold in nature, in order to:

1. Deliver high-quality education to a diverse body of graduate students regarding the etiology, control, and variation of law-breaking across space and time.
2. Serve local, regional, and national communities through professional development programs, public policy analyses, evaluation research, program and policy design, and a forum for new approaches to the study of crime.
3. Advance the understanding of criminology through a multidisciplinary mix of theoretical and applied research.

Objectives

The Doctor of Philosophy degree in Criminology is an interdisciplinary, research-oriented program that provides students with a coherent and intellectually challenging degree that prepares them for an academic, analytical or administrative appointment as a university professor competent in the oversight of research and development within criminal justice organizations, policy institutions or in the private sector.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences (EPPS) in two computing laboratories which equipped with major social science software packages, including E-Views, R, Rats, PASW, STATA, Lexis Nexis Database, and West Law for student use. The University's Computing Center provides personal computers and UNIX Workstations. Data and reference materials are also available online via the library and UTD's memberships in numerous organizations.

Graduate Assistantships

Criminology Program Funding is limited primarily to doctoral students, with limited opportunities others. Students should note their desire to be considered for graduate student funding as a teaching or research assistant in their letter of intent to the program at the time of. For more specific information, please see our Criminology Graduate Program Handbook located on our website at http://epps.utdallas.edu/crim/ .

Application and Admission Requirements

The PhD Program in Criminology seeks applicants from a baccalaureate or Masters in Criminology, Sociology, or a relevant discipline. A 3.2 GPA and a GRE score of 1200 are desirable, but students may be admitted at the program's discretion. All transcripts must be submitted, along with three letters of recommendation (preferably academic) and a one-page essay describing their background, education, and professional objectives. For more information please see our Graduate Handbook on our website.

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Degree Requirements

On admission to the Ph.D. in Criminology Program, a student must complete a 90 semester credit hours across three tiers of graduate coursework. Additionally, students must fulfill other requirements including comprehensive exams, and two writing requirements as follows:

- Coursework: 90 credit hours of graduate study (minus transferred or masters hours
- Analytical Paper Writing Requirement
- Comprehensive Examination
- Doctoral Dissertation

A grade of "C+" or worse in any graduate class requires that the class be retaken with only one retake will per course. If the retake results in a final grade of "C+" or worse, the student will be dropped from the program. In addition, all students must meet the University's minimum required GPA of 3.0 or higher. See our Criminology Graduate Program Handbook located on our website for more specific requirements.

Semester Credit Hour Requirements

Coursework Tiers and Credit Hours

Tier I

Required Criminology Core Classes: 15 hours
Electives: 15 hours (9 hours in Criminology/6 graduate hours taken in any other subject)
Writing Requirement for Analytical Paper: 6 hours
Total Tier I Hours: 36

Tier II

Required Criminology Core Classes: 12 hours
Required Additional EPPS Methods/Stats Classes: 6 hours
Criminology Electives: 9 hours
Non-Criminology Electives (in EPPS or any another school): 9 hours
Total Tier II Hours: 36

Tier III

Dissertation/Three-Paper Option Research (minimum of 18 hours)
Total Tier III Hours: 18

Total Program Hours: 90 total credit hours minimum beyond BA/BS

27 Hours	Core Criminology Courses
6 Hours	Analytical Writing
6 Hours	Additional EPPS Methods/Stats Classes
18 Hours	Criminology Electives
15 Hours	Electives outside CRIM (EPPS or any other School)
18 Hours	Dissertation
90 Hours	**TOTAL**

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Core Courses

EPPS 6310 Research Design I
CRIM 6300 Proseminar in Criminology
CRIM 6303 Etiology of Crime and Criminality
CRIM 6307 Extent of Crime and Measurement in Criminology
CRIM 6311 Crime and Justice Policy
EPPS 7313 Descriptive and Inferential Statistics
EPPS 7316 Regression and Multivariate Analysis
CRIM 7300 Advances in Criminology Theory
CRIM 7301 Seminar in Criminology Research

CRIM 6V98 Analytical Writing (6 hours)
CRIM 8V99 Dissertation hours (18 hours)

Criminology Electives

CRIM 6305 Law and Social Control
CRIM 6308 Victimology
CRIM 6309 Communities and Crime
CRIM 6310 Delinquency and Juvenile Justice
CRIM 6311 Crime and Justice Policy
CRIM 6313 Corrections
CRIM 6314 Policing
CRIM 6315 Violent Crime
CRIM 6317 Courts
CRIM 6322 Crime Prevention
CRIM 6324 Correlates of Crime and Justice
CRIM 6332 GIS Applications in Criminology
CRIM 6348 Drugs & Crime
CRIM 7342 Qualitative Criminology
CRIM 7351 Advanced Criminological Theory
CRIM 7381 Special Topics in Criminology
CRIM 8V01 Independent Study in Criminology
CRIM 8V92 Independent Advanced Research

Sample of Additional Methods/Stats Classes

EPPS 6342 Research Design II
EPPS 6346 Qualitative Research Methods
EPPS 6352 Evaluation Research Methods
EPPS 7318 Structural Equation and Multilevel (Hierarchical) Modeling
EPPS 7344 Categorical and Limited Dependent Variables
EPPS 7368 Spatial Epidemiology
EPPS 7370 Time Series Analysis
EPPS 7370 Applied Multivariate Analysis
EPPS 7386 Survey Research

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CRIM 5316 Advanced Regression Analysis

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CRIM 6324 Correlates of Crime and Justice
CRIM 6996 Master Thesis Research

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CRIM 6348 Drugs and Crime

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POEC 6316 Proseminar in Quantitative Methods
POEC 6318 Structural Equation and Multilevel (Hierarchical) Modeling
POEC 6342 Research Design II
POEC 6344 Categorical and Limited Dependent Variables
PSCI 5360 Data Collection and Analysis in Political and Social Science
PSCI 5362 Multivariate Models for Analyzing Political and Social Science Data
PSCI 5364 Mathematical Models in Political ... [15]

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The Doctor of Philosophy degree in Criminology is an interdisciplinary, research-oriented program that provides students with a coherent and intellectually challenging research degree that prepares them for an academic appointment as a university professor or an administrative appointment with oversight of research and development within criminal justice organizations. Graduates of the Ph.D. program will be competent to teach and conduct interdisciplinary research at both graduate and undergraduate levels in aspects of criminology and/or criminal justice depending on their specific areas of specialty. They also will be well prepared for analytical and administrative posts in international and domestic research and policy institutions and in the private sector.

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Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computing Center. The School has two computing laboratories which house over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, RATS, SPSS, and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University's Computing Center provides personal computers and UNIX workstations. Many important data and reference materials are available online from professional associations or at U.T.Dallas via the Library's and School's memberships in the Inter-University Consortium for Political and Social Research (ICPSR), the Roper Center, the University Consortium for Geographic Information Science (UCGIS), and other organizations. The Library has a substantial number of Criminology journals.

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Graduate teaching and research assistantships are available to the most outstanding new applicants. Prospective students interested in receiving assistantships must submit materials including application forms are due February 1. Applications may be obtained from the program director's office.

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The Doctor of Philosophy in Criminology Program seeks applications from individuals with a baccalaureate, masters of Art or Masters of Science degree in Criminology, Sociology, or a relevant discipline. A GPA of least 3.2 GPA or better and a minimum combined verbal and quantitative GRE score of 1200 are required to enter the program. A score of at least 4.5 in analytical writing is desirable. Students who marginally fail these requirements may be admitted at the Graduate Committee's discretion. Students must also submit all transcripts, three letters of recommendation (preferably academic references), and a one-page essay describing their background, education, and professional objectives. All applications will be reviewed by the Criminology Graduate Studies Committee. For more information about what should be included in the application package, please visit our web site.

Students who lack the necessary background to start the Program are advised to take courses that strengthen their preparation, but these courses do not receive credit towards the Ph.D. Program.

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On admission to the Ph.D. in Criminology, a student must complete a minimum of 90 semester credit hours of graduate coursework and requirements (including a writing requirement, qualifying exam, and doctoral dissertation). Specifically, students will be required to take graduate classes across three tiers of course work. Tier 1, or the Core Curriculum, involves 36 hours, including 9 hours of research methods and statistics, 21 hours in various aspects of criminology (i.e., contemporary criminological theory, pro-seminar in criminology, law and social control), and six hours of independent research to satisfy a writing requirement.

Upon successful completion of these 36 hours the students must pass a qualifying examination which tests a student's knowledge in key areas of criminology (i.e., historical and contemporary criminological theory, research methods, policy). Students who successfully complete the examination are admitted into candidacy and form a dissertation committee, and move into Tier 2 graduate coursework, which consists of 18 hours: 6 hours of Criminology electives (e.g., Victimology, Communities and Crime) and 12 hours of advanced methods and statistics. Students, who fail the qualifying examination or seek to leave the program for some reason, including transfer to another program, may complete the M.S. degree by writing a thesis or analytical paper.

The remaining 36 credits (to arrive at U.T.Dallas's requirement of 90 hours for the Ph.D.) will consist of (a) 6 hours of a criminology research seminar; (b) no less than 18 hours of dissertation credit; and (c) up to 12 hours of electives (which can include courses in other disciplines as well as independent studies) or 12 more hours of dissertation credit.

Students would be required to defend a dissertation proposal and complete and defend a dissertation. Upon Committee approval, the student does further work on the doctoral dissertation while enrolling continuously for credit in research seminars and in dissertation.

The dissertation has multiple chapters that consist of a clear statement of the research problem, the theoretical framework and research design, the methods of analysis and findings, and an appropriately development conclusion.

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Core Courses in Criminological Theory and Methodolog	30
Freely chosen electives in Criminology	12
Elective Credit in EPPS Methods and Statistics	12
Other Electives in Criminology and EPPS	12
Dissertation and analytic writing or thesis	24-30
Total (Minimum)	90

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EPPS Electives

POEC 6304 Advanced Analytic Techniques
POEC 6316 Proseminar in Quantitative Methods
POEC 6318 Structural Equation and Multilevel (Hierarchical) Modeling
POEC 6342 Research Design II
POEC 6344 Categorical and Limited Dependent Variables
PSCI 5360 Data Collection and Analysis in Political and Social Science
PSCI 5362 Multivariate Models for Analyzing Political and Social Science Data
PSCI 5364 Mathematical Models in Political and Social Science
PSCI 5366 Statistics in Law
ECON 5309 Mathematical Economics
ECON 5311 Applied Econometrics
ECON 6309 Econometrics I
ECON 6310 Econometrics II
ECON 6311 Statistics for Economists
ECON 6315 Time Series Econometrics
ECON 6316 Spatial Econometrics
GISC 7361 Spatial Statistics

Other Courses

CRIM 7301 Seminar in Criminology Research
CRIM 7302 Seminar in Criminology Research
Dissertation hours

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Doctor of Philosophy in Geospatial Information Sciences

http://www.gis.utdallas.edu

This degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically in the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science, and is administered by the School of Economic, Political and Policy Sciences.

Faculty

Professors: Carlos Aiken (Geosciences), Brian J. L. Berry (Economic, Political and Policy Sciences), Denis J. Dean (Economic, Political and Policy Sciences), Daniel Griffith (Economic, Political and Policy Sciences), Paul Jargowsky (Economic, Political and Policy Sciences), James Murdoch (Economic, Political and Policy Sciences), Edwin Sha (Computer Science), Robert Stern (Geosciences)
Associate Professors: Tom Brikowski (Geosciences), John Ferguson (Geosciences), Fang Qiu (Economic, Political and Policy Sciences), Michael Tiefelsdorf (Economic, Political and Policy Sciences)
Assistant Professors: Yongwan Chun (Economic, Political and Policy Sciences), Karen Hayslett-McCall (Economic, Political and Policy Sciences), Weili Wu (Computer Science)
Clinical Assistant Professors: Stuart Murchison (Economic, Political and Policy Science)

Powerful technologies have emerged in recent years to collect, store, manage, analyze, and communicate information regarding the features of the Earth's surface and to combine these with other types of environmental, social and economic information. These technologies, which include geographic information systems (GIS), the global positioning system (GPS), and remote sensing, are used in many ways, including the production of digital maps in vehicles, the management and maintenance of city infrastructure, agriculture and forestry, the policing of communities, and the conduct of modern warfare. The PhD in Geospatial Information Sciences aims to develop individuals capable of advancing this field by developing new knowledge or capabilities relevant to it.

The degree program is jointly offered by the School of Economic, Political and Policy Sciences, the School of Natural Sciences and Mathematics (specifically the Department of Geosciences) and the Eric Jonsson School of Engineering and Computer Science. This unique structure reflects geospatial information science's origins as the confluence of multiple disciplines including geography, computer science, engineering, geology, and various social, policy and applied sciences. It is anticipated that many students will enter the program with a bachelor's or master's degree (and/or work experience) in an application area (such as public administration, geology, or economics) or in a technical specialization (such as engineering, computer science, or statistics). These students may choose to pursue research projects that advance existing geospatial information sciences practices within that application area. Alternatively, students may opt to pursue research that expands the technological or theoretical base of all the geospatial information sciences.

Mission and Objectives

The mission of the Doctor of Philosophy in Geographic Information Sciences program is to cultivate innovative researchers capable of advancing the frontiers of knowledge in the geospatial information sciences through improved theories, new technologies, innovative methodologies, sophisticated quantitative analyses, and integrative applications. UT Dallas Doctoral graduates will find employment in research departments of public and private organizations and in major academic institutions. Specifically, program graduates will:

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- demonstrate their knowledge of the fundamental theories and concepts underlying the geospatial sciences.
- master the advanced methodologies and/or quantitative analyses used in at least one of three geospatial specialization areas: [a] computing and information management, spatial analysis and modeling, or [c] remote sensing and satellite technologies.
- produce innovative research that advances theory or methodology in the geospatial sciences.
- participate at academic conferences, publish in peer-reviewed journals and find employment in research departments of public and private organizations and in major academic institutions.

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Facilities

Students have access to state-of-the-art GIS computing facilities housed in the School of Economic, Political and Policy Sciences and at the NASA Center for Excellence in Remote Sensing in the Department of Geosciences. The University's extensive instructional computing facilities, including those in the Eric Jonsson School of Engineering and Computer Science, are also available. Facilities are open extended hours including evenings and weekends. Enrollment in hands-on courses is controlled to ensure that a computer workstation is available for every student. All major industry-standard GIS and remote sensing software is available. The University is an Oracle Center of Excellence for Spatial Data Management and a member of the University Consortium for Geographic Information Science (UCGIS).

Admission Requirements

The University's general admission requirements are discussed here.

The PhD program in Geospatial Information Sciences seeks applications from students with a baccalaureate, Master of Arts, Master of Science or professional masters-level degree in any field relevant to geospatial information science including, but not limited to, computer science, economics, engineering, geography, geology, management information systems, marketing, natural resource management, public affairs and public administration, statistics, and urban and regional planning. Applicants will be judged and evaluated by the existing admission standards as set forth by the University in its Graduate Catalog and by the standards set forth here by the Geospatial Information Sciences program. A bachelor's degree from an accredited institution or its equivalent and fluency in written and spoken English are required. A grade average of at least 3.25 in undergraduate and graduate course work, and a combined verbal and quantitative score of 1150 on the GRE are desirable. An analytical writing score of at least 4.5 in the GRE is considered desirable.

Students must submit transcripts from all higher education institutions attended, three letters of recommendation, and a one-page essay outlining the applicant's background, education, and personal objectives as they specifically relate to a Ph.D. in Geospatial Information Sciences.

Item #12A

Prerequisites

The following pre-requisites/co-requisites will also be required for admission to the PhD program: (i) college mathematics through calculus, (ii) competence in at least one modern programming language equivalent to GISC 6317 *Computer Programming for GIS*, CS 6301 and CS 6311*Computer Science I & II*, MIS 6322 *Developing Business Applications with Visual Basic*, MIS 6323 *Object Oriented Systems*, or their equivalents, and (iii) at least one course in inferential statistics through to regression analysis equivalent to GISC 6301 *Geospatial Data Analysis Fundamentals*, EPPS 7313 *Descriptive and Inferential Statistics*, or GEOS 6313 *Data Analysis for Geoscientists*. Graduate courses taken at UT Dallas to meet these prerequisites may be counted as electives toward the 90 credit hours required of students entering the Ph.D. program directly from a B.A. or B.S. degree, but they shall not be considered substitutes for any other specified course.

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Advising

Because of the cross-disciplinary nature of this doctoral program, to ensure adequate preparation and appropriate course sequencing, every doctoral student is required to consult with the student's designated advisor and/or the GIS Doctoral Program Director prior to registration in every semester. Students generally will not have a faculty advisor when they first enter the Ph.D. program, but every student is required to select (with consent of the potential advisor) an advisor from the advising faculty before they complete 20 credits after admission.

Degree Requirements

The University's general degree requirements are discussed here.

To receive the PhD in Geospatial Information Sciences, students must complete the Geospatial Science Core (15 SCH) to achieve a mastery of appropriate Geospatial Information Science technologies and theory, have a Geospatial Specialization Area (15 SCH), have a Specific Application area or Technical field (12 SCH), evidence research skills through successful completion and defense of a Ph. D. dissertation, and take related electives as necessary for a total of 90 semester credit hours. In addition, students must satisfy a set of exams and qualifiers. Other courses may be substituted for those listed below with the written permission in advance of the Director of the GIS Doctoral program.

Geospatial Science Core (15 SCH)

Students must earn a minimum grade point average (GPA) of 3.0 across the following five courses:

GISC 6381 GIS Fundamentals
GISC 6382 Applied GIS
GISC 6384 Spatial Analysis and Modeling
GISC 6385 GIS Theories, Models and Issues
GISC 7310 Regression Analysis with Spatial Applications

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Geospatial Specialization Area

Students must select from one of the following, with a minimum of 15 SCH. Courses selected must include at least three at successively advanced levels.

I. Geospatial Computing and Information Management

CS 6359 Object Oriented Analysis and Design
CS 6360 Database Design
CS 6364 Artificial Intelligence
CS 6366 Computer Graphics
CS 6375 Neural Nets and Machine Learning
CS 6378 Advanced Operating Systems
CS 6V80 Spatial Data Management
CS 6381 Combinatorics and Graph Algorithms
CS 6384 Computer Vision
GISC 6317 Computer Programming for GIS
GISC 6388 GIS Application Software Development
GISC 7363 Internet Mapping and Information Management
*MISC 6326 Database Management Systems

II. Spatial Analysis and Modeling

CS 6312 Data Structures
*ECON 6309 Econometrics I
*ECON 6310 Econometrics II
*ECON 6314 Structural Equation and Multilevel (Hierarchical) Modeling
*ECON 6315 (POEC 7370) Time Series Econometrics
*ECON 6316 Spatial Econometrics
EPPS 7364 Demographic Analysis and Modeling
EPPS 7368 Spatial Epidemiology
*GEOS 6313 Data Analysis for Geoscientists
*GISC 6311 (ECON 6311) Statistics for Economists
GISC 7360 GIS Pattern Analysis
GISC 7361 Spatial Statistics

*EPPS 7313 Descriptive and Inferential Statistics
*EPPS 7316 Advanced Regression Analysis

III. Remote Sensing and Satellite Technologies

GEOS 7322 GPS Surveying Techniques
GEOS 7324 3-D GIS Data Capture and Ground Lidar
GISC 6325 (GEOS 6325) Introduction to Remote Sensing
GISC 7366 (GEOS 7366) Applied Remote Sensing
GISC/7365 (GEOS 7365) Remote Sensing Digital Image Processing
GISC 7367 (GEOS 7327) Remote Sensing Workshop
EE 6360 Digital Signal Processing
EE 6363 Digital Image Processing

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IV. Customized Geospatial Specialization (15 SCH)

Identified by the student with approval in advance by the Director of the GIS Doctoral Program.

* may not be used in conjunction with certain other courses. Consult GIS Doctoral Program Director

Application Area or Technical Field (12 SCH)

Twelve semester-credit hours of specialized course work in an *application area* or *technical field* relevant to GIScience. Normally, these will derive from the student's masters degree. These hours may be transferred from another institution, or taken at UT Dallas in an existing master's program area and may be applied toward a master's in that area.

Application area examples: planning, public affairs, criminal justice, health and epidemiology, geoscience, forestry, hydrology, marketing, real estate, economics, civil engineering.

Technical field examples: statistics, computer science, software engineering, management information systems, image analysis, operations research/location science, instrumentation.

Research and Dissertation (Variable SCHs)

All students must complete the following two classes as part of the research and dissertation requirement :

GISC 7387 GIS Research Design
GISC 7389 GIS PhD Research Project Qualifier

In addition, students must complete sufficient additional research and dissertation credit hourse to bring the total number of SCHs they have earned within the UTDallas doctoral program (or transferred into the UTDallas doctoral program) to 75, the minimum required to earn a doctorial degree. Additional research and dissertation SCHs above and beyond those required to reach the 75 credit hour minimum may be required at the discretion of the student's Ph.D. advisor. Additional research and dissertation SCHs can be earned through any of the following classes:

GEOS 8V29 Research in GIS
GISC 6387 GIS Workshop
GISC 6389 GIS Masters Project
GISC 7367/GEOS 7327 Remote Sensing Workshop
GISC 8V29 Research in GIS
*EPPS 6310 & 6342 Research Design I & II
GISC 8v99 or GEOS 8v99 or CS 8v99 Dissertation

Other Related Electives (0 to 24 SCH)

Students may choose up to 24 SCHs in related electives with consent of their advisor or the GIS Doctoral Program Director.

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Item #12A

Exams and Qualifiers

- **Ph.D. Research Project Qualifying Class**

  Doctoral students must complete **GISC 7389** *Geospatial Information Sciences PhD Research Project Qualifier* according to uniform guidelines established by the GIS program.

- **Qualifying Examination and Defense of Proposal**

  After meeting the Research Project Qualifier, doctoral students must (1) demonstrate through a general exam his/her competency in the area chosen for their dissertation, and (2) successfully present and defend a dissertation proposal through an oral examination, according to uniform guidelines established by the GIS program.

- **Grade Point Qualifier**

  Doctoral students must have GPAs of at least 3.25, and preferably 3.5, in courses taken at UT-Dallas at the time they register for GISC 7389 Ph.D. Qualifier, or they must petition the GIS faculty for an exemption for extenuating circumstances beyond the student's control.

Defense of Dissertation

A dissertation must be prepared and defended successfully following the procedures established by the Dean of Graduate Studies.

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<#>The student must have a GPA of at least 3.25, and preferably 3.5, in courses taken at UT-Dallas at the time they register for GISC 7389 Ph.D. Qualifier, or they must petition the GIS faculty for an exemption for extenuating circumstances beyond the student's control.¶

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Item #12A

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GISC 7364 Demographic Analysis and Modeling
GISC 7368 Spatial Epidemiology

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GISC 7384 Advanced Raster Modeling

Master of Science in Criminology

http://epps.utdallas.edu/crim/ms.html

Faculty

Professors: James W. Marquart (Director), Bruce Jacobs, John Worrall
Associate Professors: Thomislav Kovandzic, Lynne Vieraitis
Assistant Professors: Denise Boots, Karen Hayslett-McCall, Robert Morris,
Clinical Professors: Elmer Polk
Clinical Assistant Professors: Timothy Bray, Sarah Maxwell

Mission

The Mission of the Master of Science in Criminology program at the University of Texas at Dallas is threefold, to:

1. Deliver high-quality education to a diverse body of students regarding the etiology, control, and variation of law-breaking across space and time.
2. Serve local, regional, and national communities through professional development programs, public policy analyses and evaluation research, program and policy design, and as a forum for new ideas and approaches to the study of crime.
3. Advance the understanding of criminology through a multidisciplinary mix of theoretical and applied research.

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Objectives

The Master of Science in Criminology provides students with a coherent and intellectually challenging degree that prepares them to conduct interdisciplinary research on various aspects of criminology and/or criminal justice, depending on their specific areas of specialty. Students will be well prepared for analytical and administrative posts in international and domestic research and policy institutions, criminal justice organizations, and in the private sector.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University's Computing Center provides personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library's and School's memberships in numerous organizations.

Prerequisites

For the Master of Science in Criminology, students with an undergraduate degree in Criminology or a related field will have the necessary academic foundation to begin their graduate coursework (See the Graduate Program Handbook which is posted on the EPPS Website for more information on Prerequisites and Transfer Policies at **http://epps.utdallas.edu/crim**).

Item #12B

Program of Studies Policy

Each student admitted to a graduate program will have a specific program of studies agreed upon in consultation with the Graduate Studies Committee or graduate advisor for Criminology per the degree plan for the program. A complete Program of Studies Form will be filed in and approved prior to the student's registration for his/her 19th semester credit hour to be counted toward a master's degree.

Analytical Paper Writing Requirement (MS in Criminology)

All Doctoral track students must complete a writing requirement while enrolled in the MS Program. Student must take a minimum of six enrollment hours of CRIM 6V98,complete an analytical research paper and present their findings in a colloquium setting to be eligible for graduation with the MS.

Non-Writing Requirement for the MS in Criminology

MS students on a terminal track who do not wish to be considered for admission into a doctoral program have the option of taking 6 hours of any graduate classes as electives in lieu of the writing requirement.

Coursework and Credit Hours

15 Hours of required Criminology core classes:

EPPS 6310 Research Design I
EPPS 6313 Descriptive and Inferential Statistics *
CRIM 6300 Proseminar in Criminology
CRIM 6303 Etiology of Crime and Criminality.
CRIM 6311 Crime and Justice Policy

PLUS 15 hours Electives:
9 hours in Elective Criminology graduate courses, and
6 hours in any program or school outside Criminology

AND:
6 hours of CRIM 6V96 Analytical Writing Research (for Ph.D. track students), or
6 hours of graduate-level course electives (for students wishing to terminate at MS)

Total Hours: 36

* Doctoral-track or doctoral students are advised to take EPPS 7313 Descriptive and Inferential Statistics instead of EPPS 6313 and EPPS 7316 Regression and Multivariate Analysis directly following to ensure continuity and success with the increased rigor in the doctoral level statistics/methods sequence.

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http://epps.utdallas.edu/crim/ms.html **Master of Science in Criminology**¶
Faculty¶
Professors: Bruce Jacobs, James W. Marquart, John Worrall
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http://epps.utdallas.edu/crim/ms.html **Master of Science in Criminology**

Faculty

Professors: Bruce Jacobs, James W. Marquart, John Worrall
Associate Professors: Thomislav Kovandzic, Lynne Vieraitis
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Mission

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1. Deliver high-quality education to a diverse body of students regarding the etiology, control, and variation of law-breaking across space and time.

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Objectives

The Master of Science in Criminology provides students with a coherent and intellectually challenging degree that prepares them to conduct interdisciplinary research on various aspects of criminology and/or criminal justice, depending on their specific areas of specialty. Students will be well prepared for analytical and administrative posts in international and domestic research and policy institutions, criminal justice organizations, and in the private sector.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University's Computing Center provides personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library's and School's memberships in numerous organizations.

Graduate Assistantships

Graduate teaching and research assistantships are available to the most outstanding new applicants.

Prerequisites

For the Master of Science in Criminology, students with a Bachelor of Arts in Criminology will have the necessary foundation in criminology. Students who lack this foundation should complete the following undergraduate courses at U.T.Dallas or their equivalents at another institution: CRIM 3303 Advanced Criminology, CRIM 3303 Advanced Criminal Justice, CRIM 3304 Research Methods in Crime and Justice Studies, SOC 3305 Introduction to Social Statistics. Prospective students with concerns about their preparation for the Criminology program are encouraged to consult with the program coordinator.

Degree Requirements

The University's general degree requirements are discussed here.

Students seeking a Master of Science in Criminology degree must complete 36 semester credit hours of coursework in the program. The Core curriculum involves 36 hours, including 9 hours of research methods and statistics, 21 hours in various aspects of criminology (i.e., contemporary criminological theory, proseminar in criminology, law and social control), and six hours of independent research to satisfy a writing requirement. Students must achieve at least a 3.0 grade point average in the Criminology core courses and an overall grade point average of 3.0 to graduate.

Core Courses

CRIM 5310 Research Design I
CRIM 5313 Descriptive and Inferential Statistics
CRIM 5316 Advanced Regression Analysis
CRIM 6300 Proseminar in Criminology
CRIM 6303 Etiology of Crime and Criminality
CRIM 6305 Law and Social Control
CRIM 6307 Extent of Crime and Measurement Problems in Criminology
CRIM 6311 Crime and Justice Policy
CRIM 6324 Correlates of Crime and Justice
CRIM 7300 Advances in Criminology Theory

Research Project Requirement (6 credit hours)

CRIM 6996 Master Thesis Research

Master of Science in Economics

http://www.utdallas.edu/epps/eco/

Faculty

Professors: Daniel G. Arce M., Kurt J. Beron, Rachel Croson, Catherine Eckel, James Murdoch, Todd Sandler, Barry J. Seldon, Donggyu Sul
Associate Professors:, Nathan Berg, Susan Williams McElroy, Kevin Siqueira
Assistant Professors: Rodney Andrews, Chetan Dave, Xin (Sherry) Li

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Mission

The mission of the Master of Science in Applied Economics is to provide excellent graduate-level education in economics, with an emphasis on the development of theoretical understanding of economic phenomena, quantitative skills that can be applied to economic problems, and critical thinking to understand how best to apply economic theory and quantitative skills to real-world problems. Graduates of the Economics program will have an educational background that is conducive to employment in banking or financial institutions, insurance, consulting, corporate strategic planning, real estate, journalism, management, marketing, labor arbitration, regulation, environmental and urban and regional planning and quantitative analysis. Graduates may also choose to undertake further studies in Ph.D. programs in Economics, Political Economy, and Political Science, as well as additional studies in business or law.

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R. Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database and WestLaw are also available for student use. The University's Computing Center provides personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library's and school's memberships in numerous organizations.

Admission Requirements

The University's general admission requirements are discussed here.

The master's program in Economics seeks applications from students with a baccalaureate degree from an accredited university of college. A 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 1200 on the Graduate Records Examination (GRE). Students may also wish to consider submitting their score from the writing component of the GRE test as additional evidence of their writing skills. Standardized test scores are only one of the factors taken into account in determining admission. Students should also submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant's background, education and professional objectives.

Prerequisites

Item #12C

For the Master of Science in Economics, students with a Bachelor of Science in Economics and courses in calculus and matrix or linear algebra will have the necessary foundation in economics, statistics and mathematics. Students who lack this foundation should complete the following undergraduate courses at U.T.Dallas or their equivalents at another institution: ECON 3310 Intermediate Microeconomics, ECON 3311 Intermediate Macroeconomics, ECON 4351 Mathematical Economics, ECON 4355 Econometrics, and EPPS 3303 Introduction to Social Statistics, MATH 1325 Applied Calculus I, MATH 1326 Applied Calculus II, and MATH 2333 Matrices, Vectors, and their Applications in order to begin the program.

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Degree Requirements

The University's general degree requirements are discussed here.

Students seeking a Master of Science in Economics degree must complete 36 semester credit hours of work in the program. The program has three components: 12 hours (four courses) of Required Core Courses (listed below), 9 hours of Economics Electives and 15 hours of Other Electives. Students must consult with the Director of Graduate Studies of the Economics Program each semester in order to determine the approved Economics Electives and Other Electives each semester. Students must achieve at least a 3.0 grade point average in the required courses and an overall grade point average of 3.0 to graduate.

Required Core Courses in Economics (12 hours):

ECON 5321 Microeconomic Theory for Applications
ECON 5322 Macroeconomic Theory for Applications
ECON 6305 Mathematical Economics
ECON 6306 Applied Econometrics

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Advising note: If the student intends to enter the Ph.D. program in Economics upon completion of the M.S. then he or she should consider taking ECON 6301 instead of ECON 5321 and ECON 6302 instead of ECON 5322.

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Economics Electives Courses (9 credit hours):

Approved ECON courses numbered 5000 and above.

Other Electives Courses (15 credit hours):

Approved ECON courses numbered 5000 and above or approved graduate courses from other programs.

Advising note: If the student intends to enter the Ph.D. program in Economics upon completion of the M.S. then he or she should consider taking ECON 7301 Microeconomics Theory II and ECON 7302 Macroeconomic Theory II as electives.

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Item #12D

Criminology Course Descriptions

CRIM 6300 Proseminar in Criminology. (3 semester hours) Introduction to graduate study in criminology through exposure to issues surrounding concepts of crime, criminals and societal response. Students learn to examine critically the theoretical, methodological and policy issues in criminology and criminal justice. (3-0) Y

CRIM 6303 Etiology of Crime and Criminality. (3 semester hours) Examines the history of criminological thought incorporating the major works of such theorists as Bentham, Beccaria, Marx, Durkheim, Lombroso, Shaw and McKay, Sutherland, Becker, and Merton. (3-0) Y

CRIM 6305 Law and Social Control. (3 semester hours) Addresses the legal and theoretical basis of social control and the use of criminal sanctions to deter and punish criminal conduct. Students will learn to critically assess alternative punishment and sentencing models. (3-0) Y

CRIM 6307 Extent of Crime and Measurement. (3 semester hours) Problems in Criminology. Examines the major data sources on crimes and criminals and the limitations of such data. Topics also include measurement issues and problems concerning research on the nature and extent of criminal behavior. (3-0) Y

CRIM 6308 Victimology (3 semester hours) Examines risks and consequences of crime for its victims. Issues considered include victim-offender relationships, characteristics of victims, the nature of the injuries they experience, and criminal justice procedures that involve them. (3-0) R

CRIM 6309 Communities and Crime (3 semester hours) Examines the trends and sources of crime and social disorder across communities. The course emphasizes relationships among crime, fear of crime, neighborhood change, neighborhood responses to crime, and public policies. (3-0) R

CRIM 6310 Delinquency and Juvenile Justice (3 semester hours) Examines youth crime, child victimization, and juvenile justice. Students learn the processes by which specific behaviors are identified as delinquent, the historical evolution of juvenile justice, and current policies and practices. (3-0) R

CRIM 6311 Crime and Justice Policy. (3 semester hours) An introduction to crime and the efforts to control crime through public policy. (3-0) Y

CRIM 6313 Corrections (3 semester hours) Examines the history, forms, and functions of correctional philosophies, institutions, programs, and policies. Topics include the structure and functions of prisons and jails, community corrections, intermediate sanctions, and the growth of correctional control in modern society. (3-0) R

CRIM 6314 Policing (3 semester hours) Provides historical, social and political analysis of the roles and functions of policing in America. (3-0) R

CRIM 6315 Violent Crime (3 semester hours) Examines the sources and patterns of violent offending across time and space. Topics include conceptions and typologies of violent crimes and offenders, victim-offender relationships, and efforts to predict and control violent offending. (3-0) R

CRIM 6317 Courts (3 semester hours) Examines the objectives, institutions and processes involved in the adjudication of offenders. Topics address the structure and function of the judicial system and principal court actors. (3-0) R

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CRIM 6322 Crime Prevention (3 semester hours) Examines situational, social, and legislative approaches to the prevention of crime and delinquency. Emphasis on theories, protective factors, implementation and consequences of these approaches. (3-0) R

CRIM 6324 Correlates of Crime and Justice. Examines the nature of relationships among attributes and indices at the situational and aggregate levels to various forms of crime and systems of justice. (3-0)

CRIM 6332 GIS Applications in Criminology (3 semester hours) Examines spatial distributions of crime, criminals, and criminal justice interventions. Students conduct spatial analysis of point patterns and area-based data in studies of the locations of crime events and rates, offenders, police patrolling practices, judicial districts and community corrections and how they relate to physical and social characteristics of neighborhoods. (3-0) R

CRIM 6348 Drugs and Crime (3 semester hours) This course provides students with a survey of the historical context of the legislative initiatives that have been attempted to combat the use of drugs, the relationship between drug use/abuse and crime, and the public policy problems surrounding the control of drugs. (3-0) R

CRIM 6V98 Analytical Writing Research (CRIM 7300 Advances in Criminology Theory. (1-9 semester hours) Examines contemporary criminological theories and the degree to which research has provided empirical support for explanations of crime and criminality. (May be repeated for credit.)

CRIM 7301 Seminar in Criminology Research and Analysis. (3 semester hours) Examines a variety of quantitative methods and procedures used in criminological research. Students will plan and execute an independent advanced research project. (3-0) R

CRIM 7342 Qualitative Criminology (3 semester hours) Examines ethnography and other qualitative approaches to studying crime, criminals, and criminal justice, particularly participant observation and informant and respondent interviewing. Topics include phenomenology, case study, in-depth interviewing, ethnomethodology, conversation analysis, historical methods, gaining access, sampling, data collection and analysis, and legal and ethical concerns. (3-0) R

CRIM 7351 Advanced Criminological Theory Seminar (3 semester hours) Topics will vary from semester to semester on various criminological theories. May be repeated for credit up to a maximum of 9 elective hours. Students must complete CRIM 6303 and CRIM 7300 prior to enrolling. Consult with advisor to determine appropriateness for degree plan and specialty areas of study.

CRIM 7381 Special Topics in Criminology (3 semester hours) Topics will vary from semester to semester. May be repeated for credit up to a maximum of 9 elective hours. Consult with advisor to determine appropriateness for degree plan and specialty areas of study.

CRIM 8V01 Independent Study (1-9 semester hours). Provides faculty supervision for student's individual study of a topic agreed upon by the student and the faculty supervisor. Prerequisite: Consent of instructor. (May be repeated for credit.) R

CRIM 8V92 Independent Advanced Research (1-9 semester hours) Provides faculty supervision for student's individual study of a topic agreed upon by the student and faculty supervisor. Consent of instructor required. May be repeated for credit up to a maximum of 9 hours. Student performance is assessed by instructor as pass/fail only.

CRIM 8V99 Dissertation (1-9 semester hours). Provides faculty supervision of a student's dissertation research. Prerequisite: Consent of instructor. May be repeated as necessary for credit. ([1-9]-0) Y

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CRIM 5310 (POEC 5310) Research Design I (3 semester hours) This course is the first in a two-course sequence devoted to the research enterprise and the study of data development strategies and techniques to facilitate effective statistical analysis. Topics generally covered include: (1) issues and techniques in social science research with emphasis on philosophy of science, theory testing, and hypothesis formulation; (2) measurement and data collection strategies, reliability and validity of measures and results, sampling, surveys; and (3) examination of qualitative versus quantitative research techniques, working with observational data, field research issues, and triangulation. (3-0) Y

CRIM 5313 (PA 5313, POEC 5313) Descriptive and Inferential Statistics for the Economic, Political and Policy Sciences (3 semester hours). This course is an introduction to data analysis, statistics, and regression. The only prerequisite is a sound foundation in algebra. The heart of the course is a rigorous introduction to statistical inference: sampling theory, confidence intervals, and hypothesis tests. The final section of the course covers regression analysis, which is developed in a fairly non-technical way, with an emphasis on interpretation of regression results, using examples from recent research. (3-0) Y

CRIM 5316 (POEC 5316) Advanced Regression Analysis for the Economic, Political and Policy Sciences (3 semester hours). This course provides a detailed examination of the bivariate and multiple regression models estimated using Ordinary Least Squares (OLS), with an emphasis on using regression models to test social and economic hypotheses. Also covered are several special topics in regression analysis, including violations of OLS assumptions, the use of dummy variables, fixed effects models, and path analysis. Applications are demonstrated with examples drawn from criminology, Economics, political science, public policy and sociology. (3-0) Y

CRIM 5355 (PA 5355 and POEC 5355) Introduction to Homeland Security (3 semester hours) This course provides a comprehensive overview of the structure of Homeland Security, its origins and developing trends and challenges. Selected material from Congress, FEMA, Department of Justice, local, state, and other government and non-government agencies will be studied. Examines both historical and contemporary Homeland Defense and Security issues. (3-0) Y

CRIM 5356 (PA 5356 and POEC 5356) Pre-emptive Strategies and Tactics (3 semester hours) Provides a comprehensive study of formulating pre-emptive strategies and tactics related to terrorist attacks and certain man-made disasters, such as chemical plant explosions. This course is a field-based application. Explores current published pre-emptive strategies and tactics, means and methods for improving current plans and explores new pre-emptive strategies and tactics driven by new intelligence assessments. (3-0) Y

CRIM 5357 (PA 5357 and POEC 5357) Information Sharing and Communication (3 semester hours) Provides a comprehensive overview of the structure of network, organizational and group information sharing and communication. Focuses include new theories and applications to information sharing and communication and intelligence gathering techniques of state and local fusion centers. (3-0) Y

CRIM 5358 (PA 5358 and POEC 5358) Social Networks and Intelligence Led Policing (3 semester hours) Provides a comprehensive study of concepts and methods for adopting intelligence as a foundation of law enforcement business operations for sound decision-making. Exploiting social networks is a primary means for preventing terrorism and crime. The course explores how intelligence-led policing depends on creating strong community social networks to enhance policing of criminal networks. (3-0) Y

CRIM 5359 (PA 5359 and POEC 5359) Protecting Critical Resources and Infrastructure (3 semester hours) Includes a comprehensive study of the current plans and policies in place for protecting critical resources and infrastructure, both public and private. The class will consist of a thorough review of the current literature pertaining to critical infrastructure protection policies, methods, plans, and identify new technology driven critical infrastructures. (3-0) Y

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Qualitative Criminology (3 semester hours) Examines ethnography and other qualitative approaches to studying crime, criminals, and criminal justice, particularly participant observation and informant and respondent interviewing. Topics include phenomenology, case study, in-depth interviewing, ethnomethodology, conversation analysis, historical methods, gaining access, sampling, data collection and analysis, and legal and ethical concerns. (3-0) R

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CRIM 6346 Qualitative Research Methods (3 semester hours) This course provides an overview of qualitative research in the social sciences. Students will investigate the assumptions underlying qualitative research approaches and critically assess the strengths and weaknesses of such approaches. Possible topics may include participant observation, ethnographic interviewing, ethnomethodology, conversation analysis, case study, and the analysis of historical documents. (3-0) T

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CRIM 6V96 Master Thesis Research (

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1-6 semester hours). Students conduct masters level research project under the supervision of faculty. (1-6) Y

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1-6 semester hours). Students perform independent research under the supervision of faculty. (1-6) Y

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May be repeated as necessary for credit. (3-0) Y

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SOC 6312 Social-Economic Theories. (3 semester hours) A critical analysis of theories of society and economy. These include class, culture, solidarity, rational choice, transaction cost theory, principal agent theory, ideology and hegemony, network theory, collective action, bureaucracy, and American exceptionalism. (3-0) R

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Students plan and execute an independent research project

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CRIM 7302 Seminar in Criminology Research (3 semester hours) Continuation of CRIM 7301. (3-0) R

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Item #12E

Geospatial Information Sciences Course Descriptions

GISC 6301 Geospatial Data Analysis Fundamentals (3 semester hours) Focuses on data handling techniques and applying basic statistical methodology to spatial research questions. Concepts of statistical data analysis including descriptive statistics, exploratory methods, sampling theory, statistical inference and correlation analysis are reviewed from a Geo-Information Sciences perspective. Regression analysis and basic methods of spatial pattern analysis are introduced. A prior course in statistics (such as SOCS 3405) is strongly recommended. (3-0) Y

GISC 6317 Computer Programming for GIS (3 semester hours) General introduction to Visual Basic and other languages with GIS related applications. Topics covered include fundamental data structures and algorithms, user-interface design, component object model, and data base management. Emphasis on rapid GIS application development with hands-on experiences. Students are expected to design and implement a project.(3-0)Y

GISC 6311 (ECON 6311) Statistics for Geospatial Science (3 semester hours) Introduces calculus-based statistical analysis and probability theory, providing background for econometric and spatial modeling of simple stochastic processes. Covers standard probability distributions including Bernoulli, binomial, negative binomial, hypergeometric, Poisson, normal, gamma, beta, t and F distributions; estimation and hypothesis testing; introductory asymptomatic theory, including the Law(s) of Large Numbers and the Central Limit Theorem; real-world applications of probability theory, as time permits. (3-0) Y

GISC 6325 (GEOS 6325) Introduction to Remote Sensing (3 semester hours) Application of airborne and satellite remote sensing for understanding the surface of the earth. Focus on interpretation of images obtained by passive and active imaging systems using electromagnetic radiation, especially visible, infra-red, and radar. Laboratory course. (2-3) Y

GISC 6326 Geovisualization (3 semester hours) Examines the theoretical concepts and practical applications of cartographic and geographic visualization. Topics covered in lectures include concepts for geographic data representation, symbolization and map design, and methods for geographic visualization and display. 3D visualization, cartographic animation, and web based mapping may also be included. Lab sessions explore the implementation of cartographic and geographic visualization with industry standard GIS software. Prerequisite: GISC 6381 or equivalent knowledge. (3-0) R

GISC 6332 GIS Applications in Criminology (3 semester hours) Examines spatial distribution of crime, criminals, and criminal justice interventions. Students conduct spatial analysis of point patterns and area-based data in studies of the locations of crime events and rates, offenders, police controlling practices, judicial districts and community corrections and how they relate to physical and social characteristics of neighborhoods. (3-0) R

GISC 6379 Special Topics in Geographic Information Sciences (3 semester hours) Topics vary from semester to semester. May be repeated for credit up to a maximum of 9 hours. Consult with adviser to determine appropriateness of topic for degree plan. (3-0) R

GISC 6380 Spatial Concepts and Organization (3 semester hours) Examines the recurring patterns of physical and human objects on the Earth's surface, the flows of circulations among them, and the spatial concepts and theories which have been advanced to help understand and explain these spatial arrangements. Provides a fundamental understanding of spatial processes, concepts, and theories. (3-0)

GISC 6381 Geographic Information Systems Fundamentals (3 semester hours) Examines the fundamentals of Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. (3-0) Y

GISC 6382 Applied Geographic Information Systems (3 semester hours) Further develops hands-on skills with industry-standard GIS software for application in a wide variety of areas including urban infrastructure management, marketing and location analysis, environmental management, geologic and geophysical analysis and the Economic, Political and Policy Sciences. Prerequisite: GISC 6381, or equivalent with instructor's permission. (3-0) Y

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GISC 6383 Geographic Information Systems Management and Implementation (3 semester hours) Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. (3-0) Y

GISC 6384 Spatial Analysis and Modeling (3 semester hours) Treatment of more advanced topics in the application of spatial analysis in a GIS environment. Topics covered include raster-based cartographic modeling, 3-d visualization, geostatistics and network analysis. Student will be acquainted with state-of–the-art software through hands-on laboratory experiences. Prerequisite: GISC 6381. (3-0) Y

GISC 6385 GIS Theories, Models and Issues (3 semester hours) Provides an understanding of the underlying theories, mathematical and geometric tools, and their computational implementations that establish GIS capabilities to handle and analyze geo-referenced information. Associated issues (such as uncertainty, spatial analysis and spatial data management) highlighted. Prerequisite: GISC 6381 and 6382, or equivalent with instructor's permission. (3-0) Y

GISC 6387 Geographic Information Systems Workshop (3 semester hours) Provides a structured laboratory experience focused on the students' substantive area of interest. Each participant develops a project which should include aspects of database design and manipulation, spatial analysis, and cartographic production. Projects may be designed in coordination with a local government, utility, business, or other entity that uses GIS in its operations and research. Prerequisites: GISC 6381 and GISC 6382. (3-0) Y

GISC 6388 GIS Application Software Development (3 semester hours) Provides instruction and hands-on experience in specific techniques and languages for developing application systems based on GIS concepts. Students will learn to use current generation commercial software to design and implement an application. Prerequisites: GISC 6381 and GISC 6317, or consent of instructor. (3-0) R

GISC 6389 Geospatial Information Sciences Master's Project (3 semester hours) Requires completion of an original GIS project by the student working alone or in a team. Team efforts must result in products that can be associated uniquely with each student. Projects normally continue efforts started in GISC 6387 or GISC 6386. (3-0) S

GISC 7310 Regression Analysis with Spatial Applications (*3 semester hours*) The specification, interpretation and properties of the multiple linear regression model including spatial and aspatial regression diagnostics are examined. Extensions to the logistic and Poisson regression models and spatial heterogeneity are provided. A review of the key concepts of matrix algebra and simulation techniques is given. Practical data analysis for large datasets is exercised by coupling statistical software with GIS environments. Prerequisite: GISC 6301 or GISC/ECON 6311 or equivalent. (3-0) Y

GISC 7360 GIS Pattern Analysis (3 semester hours) Examines univariate and multivariate methods for point pattern analysis, geo-statistical surface interpolations, and spatial regression models. Underlying models and processes leading to spatially clustered and spatially dispersed patterns are discussed. Course has particular relevance for local and global spatial analyses of crime, disease, or environmental patterns. Prerequisites: GISC 6381 or GISC 6311 and GISC 6301 or equivalent. (3-0) R

GISC 7361 Spatial Statistics (3 semester hours) The application of statistical techniques to the explicit treatment of space (geography) in social science models. Covers indices of spatial autocorrelation, the specification of autoregressive models (Gaussian, Poisson, binomial/logistic), geostatistical modeling, spatial filtering, Bayesian map analysis, random effects in models, and imputation of missing geocoded data. Prerequisite: GISC 7310 or EPPS 7316 or equivalent; GISC 7360 recommended . (3-0) R

GISC 7363 Internet Mapping and Information Processing (3 semester hours) Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered included client/server configuration, distributed data access and display, web-based user interaction and customization. (3-0) T

GISC 7364 (PA 6383, SOC 6364) Demographic Analysis and Modeling (3 semester hours). Examines key demographic models for population analysis, their underlying theoretical foundations, and extensions into the spatial domain. Incorporates quantitative estimation and projection techniques and their use within a geographic information systems framework. Provides a solid understanding of spatio-temporal population dynamics, either local or global, which is essential to many disciplines engaged in planning for the public and private service sectors, for transportation networks or for regional development projects. Prerequisites: EPPS 7313 or equivalent. (3-0) R

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GISC 7365 (GEOS 7326) Remote Sensing Digital Image Processing (3 semester hours) Introduction to remote sensing digital image processing techniques. Topics covered include principles of remote sensing and remote sensors, image visualization and statistics extraction, radiometric and geometric correction, image enhancement, image classification and change detection. Innovative image processing approaches will also be introduced. State-of-the-art commercial image processing software is used for labs and applications development. (3-0) Y

GISC 7366 (GEOS 7366) Applied Remote Sensing (3 semester hours) Focuses on the application of remote sensing techniques to solving real world urban and environmental problems in areas such as urban and suburban landscape, lane use and land cover, transportation and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology studies. The current generation, industry standard software is used for labs and applications development. Prerequisite: GISC 6325/GEOS 6325 (3-0) Y

GISC 7367 (GEOS 7327) Remote Sensing Workshop (3 semester hours) An independent project is designed and conducted by the student, after instructor approval. The project develops and demonstrates student's competence in using remote sensing techniques in a substantive application appropriate to his/her field of interest. Projects may be developed in coordination with a local government, utility, business, or other entity, which uses remote sensing in its operations and research. A formal presentation and a project report are required. Prerequisites: GISC 6381 and GISC 7365/GEOS 7365. (3-0) Y

GISC 7387 GI Sciences Research Design (3 semester hours) Examines issues relative to the conduct of effective and valid research in geospatial information sciences and related fields.(3-0) Y

GISC 7389 GI Sciences Ph.D. Research Project Qualifier (3 semester hours) Requires completion, according to uniform guidelines established by the GI Sciences program, of a GI Sciences Research Project and its presentation to a committee of at least three GI Sciences faculty. May be repeated once in the immediately following semester. May substitute for GISC 6389 GI Sciences Master's Project. Prerequisite: completion of 24 hours of coursework in GI Sciences Ph.D. program (3-0) Y

GISC 8320 Seminar in Spatial Analysis (3 semester hours) Examines selected topics in spatial analysis or GI Science. (May be repeated for credit when topics differ). (3-0) R.

GISC 6V98 Master's Thesis (3-9 semester hours) Provides faculty supervision of a student's master's thesis research. Prerequisite: Consent of GIS Program Head and instructor. (May be repeated for credit.) ([3-9]-0) S

GISC 8V01 Independent Study in GIS (1-9 semester hours) Provides faculty supervision for a student's individual study of a topic agreed upon by the student and the faculty supervisor. Prerequisite: Consent of instructor. (May be repeated for credit.) ([1-9]-0) S

GISC 8V27 Internship in GIS (1-9 semester hours) Provides faculty supervision for a student's internship, which must be related to GIS. ([1-9]-0) S

GISC 8V29 Research in GIS (1-9 semester hours) Provides faculty supervision of research conducted by a student. Prerequisite: Consent of instructor. (May be repeated for credit.) ([3-9]-0) S

GISC 8V99 Dissertation (1-9 semester hours) Provides faculty supervision of a student's dissertation research. Prerequisite: Consent of instructor. (May be repeated for credit.)([1-9]-0) S

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GISC 6386 Urban and Environmental Applications of GIS/Remote Sensing. (3 semester hours) Examines the use of GIS and/or remote sensing techniques for understanding selected social phenomena (such as health, political behavior, poverty, crime) or environmental conditions (such as land use, air quality, hydrology) in urban areas and for implementing potential solutions to associated problems. Requires completion of projects and/or papers that reflect the students' mastery of theory, research, data, and software. Prerequisites: GISC 6381 or GEOS 5325, or equivalent with instructor's permission. (3-0) R

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GISC 7362 GIS Network Modeling (3 semester hours) Examines the theory of network analysis and its application in Geographic Information Systems. Topics covered include graph theoretic measures of network connectivity and proofs of network properties; optimization problems including shortest path algorithms, flow algorithms, and assignment problems on networks; special solution procedures for the classic transportation problem; procedures for linear referencing and urban travel demand modeling. The implementation of these algorithms and procedures with GIS data structures is explored using industry standard GIS software. Prerequisite: GISC 6381 or equivalent knowledge. (3-0) R

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GISC 7380 (ECON 7380, POEC 7380) Applied Multivariate Analysis (3 semester hours) Application of multivariate statistical techniques to spatial and economic data. Covers parametric and non-parametric statistical theory and applications including multiple linear and non-linear regression, poisson and binomial regression, principal components and factor anlaysis, discriminant function analysis, and canonical correlation. Includes an introduction to SAS computing. Prerequisites: GISC 5316 or POEC 5316 or ECON 5311 (3-0) R

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GISC 7384 Advanced Raster Modeling (3 semester hours) Examines advanced topics in raster modeling beyond those discussed in GISC 6384 Spatial Analysis. Prerequisite: GISC 6384 or equivalent knowledge. (3-0) R

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GISC 8V98 6V98 Masters Thesis (3-9 semester hours) Provides faculty supervision of a student's master's thesis research. Prerequisite: Consent of GIS Program Head and instructor. (May be repeated for credit.) ([3-9]-0) S

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Additional Courses

Additional courses relevant to degrees in geospatial information sciences are available in other degree programs in the School of Economic, Political and Policy Sciences, in the Department of Computer Science, and in the Department of Geosciences. See the Geospatial Information Sciences degree requirements for listings of these courses.

Doctor of Audiology Program

http://bbs.utdallas.edu/.

Faculty

Professors: Peter F. Assmann, Aage R. Møller, Ross J. Roeser, Robert D. Stillman, Linda Thibodeau, Emily Tobey
Associate Professors: Michael Kilgard
Assistant Professor: Jeffrey Martin
Clinical Assistant Professors: Jackie Clark, Carol Cokely, Lee Wilson

Distinguished Scholar in Residence: James F. Jerger Faculty Associates: Beth Dorsey, Amanda Lavue, Elizabeth Gill, Anne Howell, Shari Kwan, Jaime Hampton, Holly Whalen, Chnthia MacArthur, Laura Veazey, Michelle Levin, Beth Bernthal, Jennifer Carlock, Beiseida Northruip, Bejn Rodriguez

Objectives

Doctor of Audiology (Au.D.) The AuD degree offers broad-based professional preparation in audiology within an environment supporting an active program of clinical services and research. Students receive comprehensive exposure to clinical methods and procedures in audiology and to the scientific foundations from which clinical approaches are derived. Clinic rotations are provided at the Callier Center and medical and educational settings throughout the Dallas/Ft. Worth Metroplex.

Au.D./Ph.D. degree track. Students who are interested in combining clinical and research training may combine the Au.D. with the Ph.D. in Communication Sciences and Disorders. Students must apply separately to the Ph.D. program to be considered.

Facilities

The principal site for the academic, clinical, and research activities of the Doctor of Audiology program is the U.T. Dallas Callier Center for Communication Disorders, which is adjacent to The University of Texas Southwestern Medical Center. Courses and practicum are also offered at U.T. Dallas Callier Richardson on the Main Campus of the University. The U.T. Dallas Callier Advanced Hearing Research Center provides specialized clinical and research facilities for the program. In addition to the Callier outpatient clinics, the Callier Center houses the Dallas Cochlear Implant Program, the Dallas Regional Day School for the Deaf, Tinnitus and Hyperacusis Clinic, Auditory Processing Clinic, Assistive Devices Center, and Pediatric Hearing Aid Clinic.

Admission Requirements

The University's general admission requirements are discussed here.

Admission to the Doctor of Audiology Program is based on a review of the applicant's GPA, GRE scores, letters of recommendation, and narrative description of research interests and career goals. The GRE score is included in the evaluation of the applicant's record. In general, students admitted to the program

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Distinguished Scholar in Residence: James F. Jerger

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have a combined Verbal and Quantitative score on the GRE of at least 1000. However, there is no minimum cut-off score for admission nor does a score of at least 1000 assure admission to the program.

Degree Requirements

The University's general degree requirements are discussed here.

The Doctor of Audiology (Au.D.) degree requires 97 semester hours. Students completing the Au.D. degree meet the academic and clinical practicum requirements for the Certificate of Clinical Competence offered by the American Speech-Language-Hearing Association, and Texas State licensure requirements for audiology. Specific degree requirements follow.

Required Courses (97 hours)

Foundation (25 Semester Hours)

AUD 6V20 Laboratory Procedures in Audiology and Hearing Science (taken 4 times)
AUD 6303 Hearing Science
AUD 6305 Anatomy and Physiology of Audition
AUD 6306 Speech Science
AUD 6310 Advanced Clinical Audiology
AUD 6311 Diagnostic Audiology
AUD 6316 Audiologic Rehabilitation for Adults
AUD 6318 Pediatric Audiology

Doctoral Core (25 Semester Hours)

ers
AUD 6352 Medical Audiology
AUD 7182 Topics in Patient Counseling and Student Mentoring
AUD 7321 Theories of Amplification
AUD 7324 Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments
AUD 7326 Aural Habilitation of Children with Hearing Impairments
AUD 7327 Evaluation and Fitting/Amplification Systems
AUD 7338 Research in Audiology
AUD 7339 Evidence Based Practice in Communication Disorders
AUD 7353 Clinical Electrophysiology

Advanced (21 Semester Hours)

AUD 7310 Professional Issues in Audiology
AUD 7328 Hearing Loss Prevention
AUD 7351 Physiologic Assessment of VestibularSystem
AUD 7371 Doctoral Seminar in Audiology/Elective (taken 2 times)
AUD 7340 Auditory Processing Disorders
HCS 6314 Instrumentation

Experiential (26 Semester Hours)

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HCS 7380 Practicum in Human Development and Communication Sciences (14 semester hours)
AUD 8V80 Individual Research in Audiology
AUD 8V97 Doctoral Internship in Audiology (9 semester hours)

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Out-of-Field Students

Students entering the program who lack undergraduate preparation in communication disorders are required to take a specified 6-12 semester hour sequence of corequisite courses. These courses may be taken at The University of Texas at Dallas and may be enrolled in concurrently with some graduate courses.

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Students are advised that participation in off campus clinical rotations and externship has additional requirements such as a criminal background check and hepatitis shots. Students excluded from off-campus sites for any reason may be unable to complete all degree requirements. Students are responsible for the cost of criminal background checks.

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Department of Electrical Engineering

http://www.utdallas.edu/dept/ee

Faculty

Professors: Naofal Al-Dhahir, Larry P. Ammann, Poras T. Balsara, Andrew J. Blanchard, Cyrus D. Cantrell III, Yves J. Chabal, David E. Daniel, John P. Fonseka, William R. Frensley, Andrea F. Fumagalli, Matthew Goeckner, Bruce E. Gnade, John H. L. Hansen, C. R. Helms, Louis R. Hunt (emeritus), Nasser Kehtarnavaz, Kamran Kiasaleh, Moon J. Kim, Gil S. Lee, Philipos C. Loizou, Duncan L. MacFarlane, Aria Nosratinia, Kenneth O, Raimund J. Ober, Lawrence J. Overzet, William Pervin (emeritus), Mario A. Rotea, Carl Sechen, Mark W. Spong, Don W. Shaw (emeritus), Lakshman S. Tamil, Mathukumalli Vidyasagar, Robert M. Wallace, Dian Zhou
Research Professor: Vojin Oklobdzija
Associate Professors: Dinesh Bhatia, Gerald O. Burnham, Jiyoung Kim, Jeong-Bong Lee, Jin Liu, Hlaing Minn, Won Namgoong, Mehrdad Nourani, Issa Panahi, Robert Rennaker, M. Saquib, Murat Torlak, Eric Vogel
Assistant Professors: Bhaskar Banerjee, Leonidas Bleris, Carlos A. Busso, Nicholas Gans, Rashaunda Henderson, Walter Hu, Roozbeh Jafari, Hoi Lee,
Research Assistant Professors: Wooil Kim, Kostas Kokkinakis
Senior Lecturers: Charles P. Bernardin, Nathan B. Dodge, Edward J. Esposito, Muhammad A. Kalam, Jung Lee, Randall E. Lehmann, P. K. Rajasekaran, Ricardo E. Saad, Marco Tacca

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Objectives

The program leading to the M.S.E.E. degree provides intensive preparation for professional practice in the high technology microelectronic and telecommunications aspects of electrical engineering. It is designed to serve the needs of engineers who wish to continue their education. Courses are offered at a time and location convenient for the student who is employed on a full-time basis.

The objective of the doctoral program in electrical engineering is to prepare individuals to perform original, leading edge research in the broad areas of communications and signal processing; digital systems; microelectronics and nanoelectronics, optics, optoelectronics; lightwave devices and systems; and wireless communications. Because of our strong collaborative programs with Dallas-area microelectronics and telecommunications companies, special emphasis is placed on preparation for research and development positions in these high technology industries.

Facilities

The Erik Jonsson School of Engineering and Computer Science has developed a state-of-the-art computational facility consisting of a network of Sun servers and Sun Engineering Workstations. All systems are connected via an extensive fiber-optic Ethernet and, through the Texas Higher Education Network, have direct access to most major national and international networks. In addition, many personal computers are available for student use.

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for research in microelectronics, telecommunications, and computer science. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research. The Plasma Applications and Science Laboratories have state-of-the-art facilities for mass spectrometry, microwave interferometry, optical spectroscopy, optical detection, in situ ellipsometry and

FTIR spectroscopy. In addition, a modified Gaseous Electronics Conference Reference Reactor has been installed for plasma processing and particulate generation studies. Research in characterization and fabrication of nanoscale materials and devices is performed in the Nanoelectronics Laboratory. The Optical Measurements Laboratory has dual wavelength (visible and near infrared) Gaertner Ellipsometer for optical inspection of material systems, a variety of interferometric configurations, high precision positioning devices, and supporting optical and electrical components. The Optical Communications Laboratory includes attenuators, optical power meters, lasers, APD/p-i-n photodetectors, optical tables, and couplers and is available to support system level research in optical communications. The Photonic Testbed Laboratory supports research in photonics and optical communications with current-generation optical networking test equipment. The Nonlinear Optics Laboratory has a network of Sun workstations for the numerical simulation of optical transmission systems, optical routers and all-optical networks. The Electronic Materials Processing laboratory has extensive facilities for fabricating and characterizing semiconductor and optical devices. The Laser Electronics Laboratory houses graduate research projects centered on the characterization, development and application of ultrafast dye and diode lasers.

The Center for Integrated Circuits and Systems (CICS) promotes education and research in the following areas: digital, analog and mixed-signal integrated circuit design and test; multimedia, DSP and telecom circuits and systems; rapid-prototyping; computer architecture and CAD algorithms. There are several laboratories affiliated with this center. These laboratories are equipped with a network of workstations, personal computers, FPGA development systems, prototyping equipment, and a wide spectrum of state-of-the-art commercial and academic design tools to support graduate research in circuits and systems.

The Multimedia Communications Laboratory has a dedicated network of PC's, Linux stations, and multi-processor, high performance workstations for analysis, design and simulation of image and video processing systems. The Signal and Image Processing (SIP) Laboratory has a dedicated network of PC's equipped with digital camera and signal processing hardware platforms allowing the implementation of advanced image processing algorithms. The Statistical Signal Processing Laboratory is dedicated to research in statistical and acoustic signal processing for biomedical and non-biomdedical applications. It is equipped with high-peformance computers and powerful textual and graphical software platforms to analyze advanced signal processing methods, develop new algorithms, and perform system designs and simulations. The Acoustic Research Laboratory provides number of test-beds and associated equipment for signal measurements, system modeling, real-time implementation and testing of algorithms related to audio/acoustic/speech signal processing applications such as active noise control, speech enhancement, dereverberation, echo cancellation, sensor arrays, psychoacoustic signal processing, etc.

The Center for Robust Speech Systems (CRSS) is focused on a wide range of research in the area of speech signal processing, speech and speaker recognition, and speech/language technology. CRSS is affiliated with HLTRI in the Erik Jonsson School, and collaborates extensively with faculty and programs across UTD on speech and language research. CRSS supports an extensive network of workstations, as well as a High-Performance Compute Cluster with over 15TB of diskspace and 72 CPU ROCS multi-processor cluster. The center also is equipped with several Texas Instruments processors for real-time processing of speech signals, and two ASHA certified sound booths for perceptual/listening based studies and for speech data collection. CRSS supports mobile speech interactive systems through the UTDrive program for in-vehicle driver-behavior systems, and multi-modal based interaction systems via image-video-speech research.

The Broadband Communication Laboratory has design and modeling tools for fiber and wireless transmission systems and networks, and all-optical packet routing and switching. The Advanced Communications Technologies (ACT) Laboratory provides a design and evaluation environment for the study of telecommunication systems and wireless and optical networks. ACT has facilities for designing network hardware, software, components, and applications.

The Center for Systems, Communications, and Signal Processing, with the purpose of promoting research and education in general communications, signal processing, control systems, medical and biological systems, circuits and systems and related software, is located in the Erik Jonsson School.

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The Wireless Information Systems (WISLAB) and Antenna Measurement Laboratories have wireless experimental equipment with a unique multiple antenna testbed to integrate and to demonstrate radio functions (i.e. WiFi and WiMAX) under different frequency usage characteristics. With the aid of the Antenna Measurement Lab located in the Waterview Science and Technology Center (WSTC), the researchers can design, build, and test many types of antennas.

The faculty of the Erik Jonsson School's Photonic Technology and Engineering Center (PhoTEC) carry out research in enabling technologies for microelectronics and telecommunications. Current research areas include nonlinear optics, Raman amplification in fibers, optical switching, applications of optical lattice filters, microarrays, integrated optics, and optical networking.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to U.T. Dallas graduate engineering students.

Master of Science in Electrical Engineering

Admission Requirements

The University's general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in electrical engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the M.S.E.E. program should meet the following guidelines:

- An undergraduate preparation equivalent to a baccalaureate in electrical engineering from an accredited engineering program. A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale, and GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

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Applicants must submit three letters of recommendation from individuals who are able to judge the candidate's probability of success in pursuing a program of study leading to the master's degree. Applicants must also submit an essay outlining the candidate's background, education and professional goals. Students from other engineering disciplines or from other science and math areas may be considered for admission to the program; however, some additional course work may be necessary before starting the master's program.

Degree Requirements

The University's general degree requirements are discussed here.

The M.S.E.E. requires a minimum of 33 semester hours.

All students must have an academic advisor and an approved degree plan. These are based upon the student's choice of concentration (Communications and Signal Processing; Digital Systems; Circuits and Systems; RF and Microwave Engineering, Biomedical Applications of Electrical Engineering, Solid State Devices and Micro Systems Fabrication; Optical Devices, Materials and Systems). Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the

approved course of studies leads to the M.S.E.E., M.S.E.E. with major in Telecommunications, or M.S.E.E. with major in Microelectronics degree.

The M.S.E.E. program has both a thesis and a non-thesis option. All part-time M.S.E.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor. With the prior approval of an academic advisor, non-thesis students may count no more than 6 semester-hours of research or individual instruction courses towards the 33-hour degree requirement.

All full-time, supported students are required to participate in the thesis option. The thesis option requires six semester hours of research, a written thesis submitted to the graduate school, and a formal public defense of the thesis. The supervising committee administers this defense and is chosen in consultation with the student's thesis adviser prior to enrolling for thesis credit. Research and thesis hours cannot be counted in a M.S.E.E. degree plan unless a thesis is written and successfully defended.

M.S.E.E.

This degree program is designed for students who want a M.S.E.E. without a designated degree specialization. One of the six concentrations listed below, subject to approval by a graduate adviser, should be used to fulfill the requirements of this program. Students must achieve an overall GPA of 3.0 or better, a GPA of 3.0 or better in their core MSEE classes, and a grade of B- or better in all their core MSEE classes in order to satisfy their degree requirements.

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M.S.E.E. with Major in Telecommunications

Within Telecommunications, there are two concentrations: Communications and Signal Processing, and Digital Systems.

Communications and Signal Processing

This curriculum emphasizes the application and theory of all phases of modern communications and signal processing used in telecommunications.

Each student electing this concentration must take EESC 6349, EESC 6352, and EESC 6360, and one of the following: EESC 6331, EESC 6340, EESC 6350 (12 hours).

Approved electives must be taken to make a total of 33 hours.

Digital Systems

The goal of the curriculum is to educate students about issues arising in the design and analysis of digital systems, an area relevant to a variety of high-technology industries. Because the emphasis is on systems, course work focuses on three areas: hardware design, software design, analysis and modeling.

Each student electing this concentration must take four required courses. Two of the courses are EEDG 6301 and EEDG 6304. The remaining two must be selected from EEDG 6302, EECT 6325, and EEDG 6345 (12 hours).

Approved electives must be taken to make a total of 33 hours.

M.S.E.E. with Major in Microelectronics

Within Microelectronics, there are five concentrations: Circuits and Systems; Solid State Devices and Micro Systems Fabrication; Optical Devices, Materials and Systems, RF and Microwave Engineering, and Biomedical Applications of Electrical Engineering.

Circuits and Systems

The courses in this curriculum emphasize the design and test of circuits and systems, and the analysis and modeling of integrated circuits.

Each student electing this concentration must take five required courses: Two of the courses are: EECT 6325 and EECT 6326. The remaining three must be selected from EEDG 6301, EEDG 6303, EEDG 6306, EEDG 6375, EECT 7325, EECT 7326, EECT 6378 and EERF 6330 (15 hours).

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Approved electives must be taken to make a total of 33 hours.

Solid State Devices and Micro Systems Fabrication

This concentration is focused on the fundamental principles, design, fabrication and analysis of solid-state devices and associated micro systems.

Each student electing this concentration must take the following two courses: EEGR 6316, EEMF 6319 and at least two of the following four courses: EEMF 6320, EEMF 6321,EEMF 6322 and EEMF 6382

Additional standard electives include but are not limited to: EEMF 5383/EEMF 5283, EEMF 6324, EECT 6325, EEMF 6372, EEMF 6383/EEMF 6283, EEMF 6382, EEMF 7320, EECT 7325

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Approved electives must be taken to make a total of 33 hours.

Optical Devices, Materials and Systems

This curriculum is focused on the application and theory of modern optical devices, materials and systems.

Each student electing this concentration must take the following four required courses: EEOP 6314, EEGR 6316, EEOP 6317, and at least one of the following two courses: EEOP 6310 and EEOP 6329. (12 hours).

Approved electives must be taken to make a total of 33 hours.

RF and Microwave Engineering

This curriculum is focused on the application and theory of modern electronic devices, circuits and systems in the radiofrequency and microwave regime.

Each student electing this concentration must take the following four required courses: EERF 6311, EEGR 6316, EERF 6355, and EERF 6395. (12 hours).

Approved electives must be taken to make a total of 33 hours.

Biomedical Applications of Electrical Engineering

This curriculum provides a graduate-level introduction to advanced methods and biomedical applications of electrical engineering.

Each student electing this concentration must take EEBM 6371, EEBM 6373, EEBM 6374, and two core courses from any one other concentration. (15 hours).

Approved electives must be taken to make a total of 33 hours.

Graduate Certificate in Infrared Technology

Admission Requirements

Students seeking the Graduate Certificate in IR technology may be admitted in either degree-seeking or non-degree-seeking status. The University's requirements for admission as a non-degree-seeking graduate student are discussed here. Up to 15 semester credit hours earned in non-degree-seeking status may be transferred for degree credit when a student is admitted to degree-seeking status. Students seeking the Infrared Technology Certificate should have an undergraduate preparation equivalent to a Bachelor of Science in Electrical Engineering or Physics. Students who lack the undergraduate prerequisites for the courses required for the Infrared Technology Certificate must complete these prerequisites or receive approval from the graduate adviser and the course instructor.

Each student electing the Graduate Certificate in IR Technology must take the following five courses: EEGR 6316, EEOP 6317, EEOP 6309, EEOP 6315, and EEOP 6335.

At the time of completion of the course requirements for the Infrared Technology Certificate, each student must have a grade point average of at least 3.00 and must meet all other requirements for good academic standing.

Doctor of Philosophy in Electrical Engineering

Admission Requirements

The University's general admission requirements are discussed here.

The Ph.D. in Electrical Engineering is awarded primarily to acknowledge the student's success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applicants for the doctoral program are therefore selected by the Electrical Engineering Program Graduate Committee on the basis of research aptitude, as well as academic record. Applications for the doctoral program are considered on an individual basis.

The following are guidelines for admission to the Ph.D. program in Electrical Engineering:

- A master's degree in electrical engineering or a closely associated discipline from an accredited U.S. institution, or from an acceptable foreign university. Consideration will be given to highly qualified students wishing to pursue the doctorate without satisfying all of the requirements for a master's degree. A grade point average in graduate course work of 3.5 or better on a 4-point scale. GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

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Applicants must submit three letters of recommendation on official school or business letterhead or the UTD Letter of Recommendation Form from individuals who are familiar with the student's record and able to judge the candidate's probability of success in pursuing doctoral study in electrical engineering.

Applicants must also submit a narrative describing their motivation for doctoral study and how it relates to their professional goals.

For students who are interested in a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students. All students must have an academic adviser and an approved plan of study.

Degree Requirements

The University's general degree requirements are discussed here.

Each program for doctoral study is individually tailored to the student's background and research objectives by the student's supervisory committee. The program will require a minimum of 75 semester credit hours beyond the baccalaureate degree. These credits must include at least 30 semester hours of graduate level courses beyond the baccalaureate level in the major concentration. All PhD students must demonstrate competence in the Master's level core courses in their research area. All students must have an academic advisor and an approved plan of study.

Also required are:

- A research oriented oral qualifying examination (QE) demonstrating competence in the Ph.D. candidate's research area. A student must make an oral presentation based on a review of 2 to 4 papers followed by a question-answer session. Admission to Ph.D. candidacy is based on two criteria: Graded performance in the QE and GPA in graduate level organized courses. A student entering the Ph.D. program with a M.S.E.E. must pass this exam within 3 long semesters, and a student entering without an M.S.E.E. must pass this exam within 4 long semesters. A student has at most two attempts at the QE. The QE will be given during the fall and spring semesters.
- A comprehensive examination consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate's supervising committee.
- Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student's supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student's degree program.

Research

The principal concentration areas for the M.S.E.E. program are: Communications and Signal Processing; Digital Systems; Circuits and Systems; Optical Devices, Materials, and Systems; and Solid-State Devices and Micro Systems Fabrication. Besides courses required for each concentration, a comprehensive set of electives is available in each area.

Doctoral level research opportunities include: VLSI design and test, computer architecture, embedded systems, computer aided design (CAD), ASIC design methodologies, high speed system-on chip design and test, reconfigurable computing, network processor design, interconnection networks, nonlinear signal-processing, smart antennas and array processing, statistical and adaptive signal processing, multimedia signal processing, image processing, real-time imaging, medical image analysis, pattern recognition, speech processing, control theory, digital communications, modulation and coding,

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electromagnetic-wave propagation, diffractive structures, fiber and integrated optics, nonlinear optics, optical transmission systems, all-optical networks, optical investigation of material properties (reflectometry and ellipsometry), optical metrology, lasers, quantum-well optical devices, theory and experiments in semiconductor-heterostructure devices, plasma deposition and etching, nanoelectronics, wireless communication, network protocols and evaluation, mobile computing and networking, and optical networking.

Interdisciplinary Opportunities: Continuing with the established tradition of research at U. T. Dallas, the Electrical Engineering Program encourages students to interact with researchers in the strong basic sciences and mathematics. Cross disciplinary collaborations have been established with the Chemistry, Mathematics, and Physics programs of the School of Natural Sciences and with faculty in the School of Brain and Behavioral Science.

Item #12H

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: 10/21/2009
TO: GRADUATE DEAN
FROM: Bob Stillman
Please indicate with an X if your department catalog copy has no changes _____

SCHOOL_BBS_____

DEPARTMENT_ACN_____

BASIS FOR CATALOG CHANGES:
Reduce 7000 level courses to 6000 level courses_____

NEW PROGRAMS/DEGREES/CERTIFICATES

Course numbering and changes in credit hour changes should be reflected in the two categories below.
NEW COURSES ADDED: ACN 6316, ACN 6319, ACN 7324, ACN 6331, ACN 6339, ACN 6368

CHANGED IN COURSE NUMBERING: ACN 6344, ACN 6322

COURSES DELETED:

CHANGES IN COURSE NUMBERING: ACN 7344 (to ACN 6344), ACN 7322 (to ACN 6322)

OTHER_____

Item #12H

Approved:_____

School/Department

Graduate Program in Arts and Technology

Master of Arts

The program leading to the M.A. in Arts and Technology is designed both for individuals engaged in professional practice wishing to enhance their knowledge and skills and for students intending to pursue a doctorate in a related field. It offers advanced studies in interactive media and computer-based arts that emphasize the fusion of creative with critical thing and theory with practice. Students must complete thirty-six semester hours of course work and an advanced project.

Core Courses (6 hours)

ATEC 6300 Interdisciplinary Approaches to Arts and Technology
ATEC 6331 Aesthetics of Interactive Arts
Students are expected to complete these courses as early as possible in their degree plan.

Prescribed Electives (27 hours)

Twenty-seven hours chosen from the following courses:
ATEC 6332 Design Principles
ATEC 6333 Computational Design
ATEC 6334 Information Design for New Media
ATEC 6335 Research in Sound Design
ATEC 6341 Game Design
ATEC 6342 Game Studies
ATEC 6343 Interactive Environments
ATEC 6345 Game Production Lab
ATEC 6351 Digital Arts
ATEC 6352 Motion Capture
ATEC 6353 Visualization Research
ATEC 6354 Immersive Environments
ATEC 6355 Animation Production Lab
ATEC 6361 Writing for Interactive Media
ATEC 6371 Community Media
ATEC 6374 Digital Textuality
ATEC 6375 Cyberpsychology
ATEC 6376 E-Business Environment Design
ATEC 6V81 Special Topics in Emergent Communication
HUAS 6313 The Business of the Arts
HUAS 6312 Art and Society
HUAS 6330 Studies in Visual Arts
HUAS 6375 Imagery and Iconography
HUAS 6392 Image/Text Workshop
HUAS 6393 Time-Based Arts Workshop
HUSL 6308 Studies in Literary Forms
HUSL 6370 Literature and Ideas

Final Project (3 hours)

ATEC 6V95 Advanced Project Workshop

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Having completed at least 30 hours of course work, students will complete and present an advanced project in digital arts for evaluation by a master's committee.

Master of Fine Arts

The program leading to the M.F.A. in Arts and Technology is designed both for students wishing to teach arts-and-technology-related courses in colleges and universities and for those intending to engage in professional studio or design practice. While maintaining a commitment to interdisciplinary education fusing critical with creative thinking, this program places greater emphasis on the creation and application of computer-based arts and narrative. Students must complete fifty-four semester hours of course work and a substantial advanced project.

Core Courses (6 hours)

ATEC 6349 Interdisciplinary Approaches to Arts and Technology
ATEC 6331 Aesthetics of Interactive Arts
Students are expected to complete these courses as early as possible in their degree plan.

Prescribed Electives (24 hours)

Twenty-four hours chosen from the following courses:
ATEC 6332 Design Principles
ATEC 6333 Computational Design
ATEC 6334 Information Design for New Media
ATEC 6335 Research in Sound Design
ATEC 6341 Game Design
ATEC 6342 Game Studies
ATEC 6343 Interactive Environments
ATEC 6345 Game Production Lab
ATEC 6351 Digital Arts
ATEC 6352 Motion Capture
ATEC 6353 Visualization Research
ATEC 6354 Immersive Environments
ATEC 6355 Animation Production Lab
ATEC 6361 Writing for Interactive Media
ATEC 6371 Community Media
ATEC 6374 Digital Textuality
ATEC 6375 Cyberpsychology
ATEC 6376 E-Business Environment Design
ATEC 6V81 Special Topics in Emergent Communication
HUAS 6312 Art and Society
HUAS 6313 The Business of the Arts
HUAS 6317 Art and Authorship
HUAS 6330 Studies in Visual Arts
HUAS 6352 Creating TV and Movie Scripts
HUAS 6373 Studies in Film
HUAS 6375 Imagery and Iconography
HUAS 6392 Image/Text Workshop
HUAS 6393 Time-Based Arts Workshop
HUAS 6354 Creating Short Fictions

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HUSL 6308 Studies in Literary Forms
HUSL 6370 Literature and Ideas

Free Electives (9 hours)

Nine hours of electives in any organized courses.

Independent Study (9 hours)

Final Project (6 hours)

ATEC 6V95 Advanced Project Workshop

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Having completed at least 45 hours of course work, students complete and present a substantial advanced project in digital arts for evaluation by a master's committee.

Item #12J

Course Descriptions

AUD 6303 Hearing Science (3 semester hours) Basic acoustics and psychoacoustics. (3-0) Y
AUD 6305 Anatomy and Physiology of Audition (3 semester hours) Structure and function of the auditory system including external, middle, and inner ear, and central auditory mechanisms. (3-0) Y
AUD 6306 Speech Science (3 semester hours) The physical properties of speech and the perceptual, cognitive and neural processes that intervene between the production and perception of speech in everyday speech communication. (3-0) Y
AUD 6310 Advanced Clinical Audiology (3 semester hours) Instrumentation and calibration standards for audiology practice. The development and application of standard diagnostic audiological procedures. Administration and interpretation of standard audiometric tests. (3-0) Y
AUD 6311 Diagnostic Audiology (3 semester hours) The development and application of advanced diagnostic procedures for audiological diagnosis including behavioral and electrophysiological measures (ABR and OAE). Administration and interpretation of diagnostic audiological tests. (3-0) Y
AUD 6316 Audiologic Rehabilitation for Adults (3 semester hours) Evaluation and remediation of impairment, limitations and restrictions associated with hearing loss. Emphasis on hearing aid orientation and benefit, counseling, assistive technology, coping skills, communication strategies, speech reading, advocacy for adults with hearing loss, and partnering with community mentors. (3-0) Y
AUD 6318 Pediatric Audiology (3 semester hours) Etiological, medical and genetic considerations relevant to the pediatric population. Emphasis on current diagnostic options with infants and young children, including those having mental retardation or multiple disabilities. (3-0) Y
AUD 6352 Medical Audiology (3 semester hours) Etiology and pathology of auditory/vestibular disorders and diagnostic and treatment procedures. (3-0) Y
AUD 6V20 Laboratory Procedures in Audiology and Hearing Science (1-9 semester hours) Application in structured laboratories of principles taught in diagnostic audiology, rehabilitation audiology, hearing science, amplification, cochlear implant and electrophysiology courses. To be taken with AUD 6303, AUD 6310, AUD 6311, AUD 6316, AUD 7321, AUD 7326, AUD 7327 and AUD 7353. (May be repeated for credit.) (0-[1-9]) Y
AUD 7182 Topics in Patient Counseling and Professional Mentoring (1 semester hour) Application of counseling and mentoring theories. Counselors and mentors across various disciplines address key issues regarding collaboration and conflict as they pertain to interactions between clinician and patient within the family structure as well as in the workplace. (1-0) Y
AUD 7310 Professional Issues in Audiology (3 semester hours) Ethics and professional issues in various practice settings, including multicultural considerations, licensure, certification, outcome measures, liability, malpractice, and practice management. (3-0) Y
AUD 7321 Theories of Amplification (3 semester hours) Principles underlying soundfield acoustics and calibration, earmold acoustics, speech perception in hearing impaired persons, and fitting methods. (3-0) Y
AUD 7324 (COMD 7324, ACN 7324) Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments (3 semester hours) Overview of prosthetic alternatives to conventional amplification for individuals with severe-to-profound hearing loss. Topics include candidacy determination, technology, programming/fitting of devices, aural (re)habilitation, and awareness of controversial areas related to cochlear implantation. (3-0) Y
AUD 7325 Intensive Auditory Rehabilitation for Adult Hearing Loss (3 semester hours) Intensive experience with comprehensive rehabilitation of adults and/or teens with a focus on research and clinical techniques to facilitate communication in employment, social, and home situations through the use of communication strategies and advanced assistive technology. (3-0) Y
AUD 7326 Aural Habilitation of Children with Hearing Impairments (3 semester hours) Issues in selection and fitting of amplification and FM systems for children, rationale and methods of auditory training, optimizing the auditory environment, communication options, and family-centered intervention. (3-0) Y
AUD 7327 Evaluation and Fitting of Amplification Systems (3 semester hours) Advanced study of analog and digital technology in amplification systems including: programmable hearing aids, compression characteristics, noise reduction, and speech enhancement strategies. (3-0) Y

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Deleted: AUD 6348 (COMD 6348) Counseling for Communication Disorders Professionals (3 semester hours) Psychological aspects of communication disorders in the context of the family system. Basic counseling and problem-solving skills to use as an adjunct to roles as communication disorders professionals. Emphasis on helping students to gain comfort and skill in coping with their clients' emotions and giving their clients constructive feedback. (3-0) R
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Item #12J

AUD 7328 Hearing Loss Prevention (3 semester hours) Identification and prevention of hearing loss in children and adults through screening programs. Includes school, community, and industrial-based hearing conservation programs, hearing protection, and ototoxicity. (3-0) Y

AUD 7338 Research in Audiology (3 semester hours) Review of statistical principles including the relationship between working hypotheses and methodology and outcomes to prepare individuals to become a critical consumer of research. Scientific writing process is taught including components of journal publication, scientific posters, and writing style. (3-0) Y

AUD 7339 (COMD 7339) Evidence-Based Practice in Communication Disorders (3 semester hours) Origins, strengths and limitations of the evidence-based practice paradigm. Methods for finding, appraising, and incorporating high-quality evidence into clinical decisions about screening, diagnosing and treating speech, language, and hearing disorders. (3-0) Y

AUD 7340 Auditory Processing Disorders (3 semester hours) Auditory processing disorders with respect to underlying etiologies and behavioral and electrophysiologic procedures for diagnosis and therapeutic management. (3-0) Y

AUD 7351 Physiologic Assessment of Vestibular System (3 semester hours) Anatomy, physiology and pathophysiology of the vestibular, oculomotor and related systems used for maintaining equilibrium and balance. Procedures used for diagnostic assessment of the vestibular system and medical and non-medical treatments for vestibular disorders. (3-0) Y

AUD 7353 Clinical Electrophysiology (3 semester hours) Evoked and event-related potentials including recording techniques, neurophysiological mechanisms, and applications to clinical populations. (3-0) Y

AUD 7371 Doctoral Seminar in Audiology (3 semester hours) Selected topics and current research in audiology and hearing science. (May be repeated for credit.) (3-0) Y

AUD 7V80 Doctoral Practicum in Audiology (1-9 semester hours) Supervised doctoral level experience in assessment and habilitation/rehabilitation of hearing impairment. (May be repeated for credit.) ([1-9]-0) S

AUD 7V82 Special Topics in Hearing Science and Audiology (1-9 semester hours) Selected topics and current research in hearing science and audiology. Topics will vary from semester to semester. (May be repeated for credit.) ([1-9-0]) R

AUD 8V80 Individual Research in Audiology (1-9 semester hours) Independent research project to fulfill the Doctor of Audiology research requirement. (May be repeated for credit.) ([1-9]-0) S

AUD 8V97 Doctoral Internship in Audiology (1-9 semester hours) Intensive, full-time, clinical audiology practicum in a work setting that provides exposure to a diverse clinical population and a wide breadth of audiologic services. Completed during the fourth year of the Au.D. Program. (May be repeated for credit.) ([1-9]-0) S

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Item #12J

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Prosthetic alternatives available for individuals with profound hearing impairments. Topics include speech perception in children and adults, signal processing, aural rehabilitation techniques, prosthetic devices such as cochlear implants and techniques for using such devices. (3-0) Y

Item #12K

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: 10/21/2009
TO: GRADUATE DEAN
FROM: Bob Stillman
Please indicate with an X if your department catalog copy has no changes _____

SCHOOL_BBS_____

DEPARTMENT__AUD_____

BASIS FOR CATALOG CHANGES:

_____

NEW PROGRAMS/DEGREES/CERTIFICATES

Course numbering and changes in credit hour changes should be reflected in the two categories below.
NEW COURSES ADDED: AUD 7182

COURSES DELETED: AUD 6348

OTHER_____

Approved:_____
School/Department

SCHOOL OF BEHAVIORAL AND BRAIN SCIENCES

The School of Behavioral and Brain Sciences offers graduate preparation at the Masters and Doctoral levels designed to meet the needs of students with both research and professional objectives. With instruction and mentoring from internationally recognized faculty, the School's programs emphasize interdisciplinary training coupled with opportunities for intensive research and clinical supervision. The School's degree programs draw upon three clusters of expertise in the School: Communication Sciences and Disorders, Cognition and Neuroscience, and Psychological Sciences. The Callier Center for Communication Disorders-Dallas and Callier-Richardson, large comprehensive clinical and research centers, as well as the Advanced Hearing Research Center, the Center for Brain*Health*, and the Center for Children and Families further enrich the training of students.

The programs in the School include masters training in Applied Cognition and Neuroscience, Communication Disorders, Human Development and Early Childhood Disorders and Psychological Sciences. Doctoral training is provided in the professional doctorate in Audiology (Au.D.) and the Ph.D.s in Cognition and Neuroscience, Communication Sciences and Disorders, and Psychological Sciences. The School also offers a certificate program for graduate students with interests in Evaluation Research.

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DEGREES OFFERED

Master of Science in Applied Cognition and Neurosciences
Master of Science in Communication Disorders
Master of Science in Human Development and Early Childhood Disorders
Master of Science in Psychological Sciences

Doctor of Audiology
Doctor of Philosophy in Cognition and Neuroscience
Doctor of Philosophy in Communication Sciences and Disorders
Doctor of Philosophy in Psychological Sciences

Certificate in Evaluation Research

Biomedical Engineering

http://ecs.utdallas.edu/BME/

Faculty

Professors: John H. L. Hansen, Philipos Loizou, Raimund Ober, Mathukumalli Vidyasagar, Li Zhang
Associate Professors: Dinesh Bhatia, Jinming Gao
Assistant Professors: Leonidas Bleris, Walter Hu, Hyun-Joo Nam

Objectives

The objective of the Ph.D. Program in Biomedical Engineering is to train exceptional persons to become leaders in the field through high quality original research work, supplemented as appropriate by a broad range of interdisciplinary courses. The new generation of biomedical engineers will address fundamental scientific questions, provide answers to critical problems and develop novel applications with commercial potential. The opportunities for interdisciplinary research and course work in several branches of engineering coupled with the life sciences will allow the graduates of this program to tackle complex life sciences-related problems in novel ways and to create solutions for the future.

The objective of the MS degree program in Biomedical Engineering is to produce BME graduates who will be capable of undertaking challenging BME-related projects. The primary educational objective of the M.S. program is to expose students to the latest developments in biomedicine and to provide them with the appropriate tools to understand and contribute further to these developments. The M.S. degree program will provide the necessary education and immediately applicable skills that will enable both recent baccalaureate graduates and experienced biomedical engineers to develop new life science related technologies and applications.

Facilities

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive wet lab, fabrication, instrumentation, and high performance computing facilities to foster biomedical engineering and nano-technology research. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research. In addition to the facilities on campus, students in this program will also have an opportunity to work closely with researchers in the UT Southwestern Medical School.

Master of Science in Biomedical Engineering

Admission Requirements

The University's general admission requirements are discussed here.
A student lacking undergraduate prerequisites for graduate courses in biomedical engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor. An entrance examination may be required. Specific admission requirements follow.

The student entering the M.S.B.M.E. program should meet the following guidelines:

- An undergraduate preparation equivalent to a baccalaureate in a field of engineering or the sciences,
- A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale, and

- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals who are able to judge the candidate's probability of success in pursuing a program of study leading to the master's degree. Applicants must also submit an essay outlining the candidate's background, education and professional goals.

Degree Requirements

The University's general degree requirements are discussed here.
The M.S.B.M.E. requires the completion of a minimum of 33 semester hours.
All students must have an academic advisor and an approved degree plan.
For the M.S.B.M.E program, all students must pass the following courses with a grade of B- or better:

- BMEN 6376 Lecture Course in Biomedical Engineering Applications
- BMEN 6373 Anatomy and Human Physiology for Engineers
- BMEN 6374 Genes, Proteins and Cell Biology for Engineers

The M.S.B.M.E. program has both a thesis and a non-thesis option. All part-time M.S.B.M.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor. Research and thesis hours cannot be counted in a M.S.B.M.E. degree plan unless a thesis is written and successfully defended.
Students must achieve an overall GPA of 3.0 or better, a GPA of 3.0 or better in their core MSBME classes, and a grade of B- or better in all their core MSBME classes in order to satisfy their degree requirements.
All full-time, supported students are required to participate in the thesis option.

Doctor of Philosophy in Biomedical Engineering

Admission Requirements

The University's general admission requirements are discussed here.
The Ph.D. in Biomedical Engineering is awarded primarily to acknowledge the student's success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applicants for the doctoral program are therefore selected by the Biomedical Engineering Program Graduate Committee on the basis of research aptitude, as well as academic record. Applications for the doctoral program are considered on an individual basis.

The following are guidelines for admission to the Ph.D. program in Biomedical Engineering:

- A master's degree in engineering or one of the sciences from an accredited U.S. institution, or from an acceptable foreign university. Consideration will be given to highly qualified students wishing to pursue the doctorate without satisfying all of the requirements for a master's degree.
- A grade point average in graduate course work of 3.5 or better on a 4-point scale.
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation on official school or business letterhead or the UTD Letter of Recommendation Form from individuals who are familiar with the student's record and able to judge the candidate's probability of success in pursuing doctoral study in biomedical engineering.
Applicants must also submit a narrative describing their motivation for doctoral study and how it relates to their professional goals.

Item #12M

For students who are interested in a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students.
All students must have an academic adviser and an approved plan of study.

Degree Requirements

The University's general degree requirements are discussed here.

Each program for doctoral study is individually tailored to the student's background and research objectives by the student's supervisory committee. The program will require a minimum of 75 semester credit hours beyond the baccalaureate degree. These credits must include at least 18 semester hours of graduate level courses beyond the baccalaureate level in the major concentration. All PhD students must demonstrate competence in the Master's level core courses in their research area. All students must have an academic advisor and an approved plan of study.

Also required are:

- A research oriented oral qualifying examination (QE) demonstrating competence in the Ph.D. candidate's research area. A student must make an oral presentation based on a review of 2 to 4 papers followed by a question-answer session. A student entering the Ph.D. program with a M.S.B.M.E. must pass this exam within 3 long semesters, and a student entering without an M.S.B.M.E. must pass this exam within 4 long semesters. A student has at most two attempts at this qualifying exam. The exam will be given during the fall and spring semesters.
- A comprehensive exam consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate's supervising committee.
- Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student's supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student's degree program.

Item #12N

Biomedical Engineering Course Descriptions

BMEN 6373 Anatomy and Human Physiology for Engineers (3 semester hours) This course provides an introduction to anatomy and human physiology for engineers and other non-life-scientists. Topics include nervous system, muscle and cardiac function, digestive system, immune system. (3-0) Y
BMEN 6374 Genes, Proteins and Cell Biology for Engineers (3 semester hours) This course provides an introduction to principles of modern molecular and cellular biology for engineers and other non-life-scientists. Topics include genes, protein structure and function, organization of cells and cellular trafficking. (3-0) Y
BMEN 6375 Techniques in Cell and Molecular Biology (3 semester hours) Introduction to various cell and molecular laboratory techniques including DNA recombinant technology, protein biochemistry, structural biology, and molecular biology. Intended for engineers and other non-life-scientists. Prerequisite: BMEN 6374 or instructor permission. (3-0) Y.
BMEN 6376 Lecture Course in Biomedical Engineering (3 semester hours) This course provides an introduction to different areas of biomedical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y
BMEN 6377 Introduction to Protein Engineering (3 semester hours) Development of proteins with practical utility will be discussed using examples and case studies taken from the current literature. Prerequisites: BMEN 6374 or by instructor permission. (3-0) Y.
BMEN 6380 Introduction to Cellular Microscopy (3 semester hours) Image formation, diffraction, labeling techniques, fluorescence and image processing techniques will be introduced. (3-0) Y
BMEN 6381 Advanced Concepts in Microscopy (3 semester hours) Continuation of BMEN 6380, with emphasis on advanced approaches such as vectorial diffraction, stochastic aspects of image formation and analysis. Prerequisites: BMEN 6380 or by instructor permission. (3-0) Y.
BMEN 6382 Systems Biology (3 semester hours) An interdisciplinary approach to biology. It explores experimental, theoretical, and computational approaches from mathematics, physics, and engineering for the understanding and analysis of biological problems. Prerequisites: BMEN 6374 or instructor permission. (3-0) Y.
BMEN 6383 Biological Networks (3 semester hours) This course will examine the fundamental principles and associated structure of a range of biological networks at the molecular, cellular, and population levels. Prerequisites: BMEN 6374 or instructor permission. (3-0) Y.
BMEN 6384 Stochastic Methods in Biomedical Engineering (3 semester hours) This course will examine stochastic approaches to several problems in genomics and proteomics, such as sequence similarity detection, gene and protein classification, and structure prediction. Techniques such as Markov and hidden Markov models will be introduced in the course and applied to these problems. (3-0) Y.
BMEN 6V70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R
BMEN 6V71 Seminars In Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([1-9]-0) R
BMEN 6V87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) S
BMEN 6V40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R
BMEN 6V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S
BMEN 7390 Works in Progress (1 semester hours) Presentation of research results obtained during dissertation research. (May be repeated for credit.) (2-0) Y.
BMEN 7391 Journal Club (2 semester hours) Presentation and discussion of scientific literature in biomedical engineering. (May be repeated for credit.) (2-0) Y.
BMEN 7V87 Special Topics in Biomedical Engineering (1-9 semester hours) (May be repeated for credit) ([1-9]-0) S
BMEN 7V88 Seminars In Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R

Item #12N

BMEN 8V40 Individual Instruction in Biomedical Engineering (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R
BMEN 8V70 Research In Biomedical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R
BMEN 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

Graduate Program in Computer Engineering

http://www.ce.utdallas.edu

Faculty

Professors: Poras T. Balsara, Farokh B. Bastani, Cyrus D. Cantrell III, Dingzhu Du, Andrea Fumagalli, Gopal Gupta, Kamran Kiasaleh, William J. Pervin, Lakshman Tamil, Carl Sechen, Hsing-Mean (Edwin) Sha, Kang Zhang, Si-Qing Zheng, Dian Zhou
Research Professor: Vojin Oklobdzija
Associate Professors: Dinesh K. Bhatia, Jorge A. Cobb, Ovidiu Daescu, Galigekere R. Dattatreya, Neeraj Mittal, Mehrdad Nourani, Ivor P. Page, Issa Panahi, Balakrishnan Prabhakaran , Ravi Prakash, S. Venkatesan, Yuke Wang, Weili Wu
Assistant Professors: Roozbeh Jafari,
Senior Lecturer: Nathan Dodge

Deleted: Ramaswamy Chandrasekaran,

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Objectives

The M.S. and Ph.D. degrees in Computer Engineering emerged as a bridge between the increasingly overlapping disciplines of Computer Science and Electrical Engineering. The M.S.C.E. degree program provides intensive preparation for engineers who seek knowledge and skills necessary for the design of complex systems comprised of both hardware and software components. It has a heavy emphasis on the design of high speed and complex hardware and highly reliable and time critical software systems.

Computer Engineering at UTD is a broadly based engineering discipline dealing with the sensing, processing, and transmission of information by making extensive use of electrical engineering and computer science principles. The CE program at UTD also encourages students and faculty to develop synergies with disciplines outside of engineering, such as medicine and the life sciences. CE faculty members are actively involved in advanced research and teaching in all major areas of computer engineering. The Erik Jonsson School is home to several research centers, and promotes graduate and undergraduate curriculum innovation. It is the driving force behind computer engineering's rapid success and growth. The Erik Jonsson School has a large infrastructure of computing and other laboratory resources. The M.S.C.E. degree program provides intensive preparation for engineers who seek knowledge and skills necessary for the design of complex systems comprised of both hardware and software components. It has a heavy emphasis on the design of high speed and complex hardware and highly reliable and time critical software systems. It is designed to serve the needs of engineers who wish to continue their education. Courses are offered at a time and location convenient for the student who is employed on a full-time basis.

Facilities

The Erik Jonsson School of Engineering and Computer Science has developed a state-of-the-art computational facility consisting of a network of Sun servers and Sun Engineering Workstations. All systems are connected via an extensive fiber-optic Ethernet and, through the Texas Higher Education Network, have direct access to most major national and international networks. In addition, many personal computers are available for student use.

The Engineering and Computer Science Building provides extensive facilities for research in electrical engineering, telecommunications, and computer science and engineering.

The Center for Integrated Circuits and Systems (CICS) promotes education and research in the following areas: digital, analog and mixed-signal integrated circuit design and test; multimedia, DSP and telecom circuits and systems; rapid-prototyping; computer architecture and CAD algorithms. There are several laboratories affiliated with this center. These laboratories are equipped with a network of workstations, personal computers, FPGA development systems, prototyping equipment, and a wide spectrum of state-of-the-art commercial and academic design tools to support graduate research in circuits and systems.

The Center for Systems, Communications, and Signal Processing, with the purpose of promoting research and education in general communications, signal processing, control systems, medical and biological systems, circuits and systems and related software, is located in the Erik Jonsson School.

In the Digital Signal Processing Laboratory several multi-CPU workstations are available in a network configuration for simulation experiments. Hardware development facilities for real time experimental systems are available and include microphone arrays, active noise controllers, speech compressors and echo cancellers. The Distributed Computing Laboratory has a network of personal computers running Linux to support network simulation using discrete-event simulation packages. The Hardware/Software Co-design Laboratory has many workstations and PCs with DSP modules to support the experiments for various implementations in DSP and communications.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to U.T. Dallas graduate engineering students.

Master of Science in Computer Engineering (M.S.C.E.)

Admission Requirements

The University's general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in electrical engineering and computer science must complete these prerequisites or receive approval from the graduate advisor and the course instructor. A diagnostic exam may be required. Specific admission requirements follow.

The student entering the M.S.C.E. program should meet the following guidelines:

- An undergraduate preparation equivalent to a baccalaureate in computer science or electrical engineering from an accredited engineering program.
- A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale.
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals able to judge the candidate's probability of success in pursuing master's study. Applicants must also submit an essay outlining the candidate's background, education and professional goals.

Students from other engineering disciplines or from other science and math areas may be considered for admission to the program on a case-by-case basis; however, some additional course work may be necessary before starting the master's program.

Degree Requirements

The University's general degree requirements are discussed here.

The M.S.C.E. requires a minimum of 33 semester hours.

All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the approved course of studies leads to the M.S.C.E. degree.

The M.S.C.E. program has both a thesis and a non-thesis option. All part-time M.S.C.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

All full-time, supported students are required to participate in the thesis option. The thesis option requires six semester hours of research, a written thesis submitted to the graduate school, and a formal public defense of the thesis. The supervising committee administers this defense and is chosen in consultation with the student's thesis advisor prior to enrolling for thesis credit. Each student must take 4 required courses:

CE 6302 Microprocessor Systems
CE 6304 Computer Architecture
CE 6325 VLSI Design
CE 6378 Advanced Operating Systems

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Approved electives must be taken to make a total of 33 hours. These courses must be at 6000 level or higher from computer engineering, electrical engineering, computer science and telecommunications engineering curricula with the approval of the advisor. It is highly recommended that two of these electives be chosen from the following list:

CE 6303 Testing and Testable Design
CE 6305 Computer Arithmetic
CE 6308 Real-Time Systems
CE 6352 Performance of Computer Systems and Networks
CS 6353 Compiler Construction
CE 6370 Design and Analysis of Reconfigurable Systems
CE 6375 Design Automation of VLSI Systems
CE 6380 Distributed Computing
CE 6397 Synthesis and Optimization of High Performance Systems
CE 6398 DSP Architectures

Students must achieve an overall GPA of 3.0 or higher, a GPA of 3.0 or higher in their core MSCE classes, and a grade of B- or higher in all their core MSCE classes in order to satisfy their degree requirements.

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Doctor of Philosophy in Computer Engineering

Objectives

The Ph.D. in Computer Engineering is awarded primarily to acknowledge the student's success in an original research project, the description of which is a significant contribution to the literature of the discipline. Applicants for the doctoral program are therefore selected by the Computer Engineering

Deleted: Each doctoral degree program is tailored to the student. The student must arrange a course program with the guidance and approval of a faculty member chosen as his/her graduate advisor. Adjustments can be made as the student's interests develop and a specific dissertation topic is chosen. ¶

Program Graduate Committee on the basis of research aptitude, as well as academic record. Applications for the doctoral program are considered on an individual basis.

Admission Requirements

The University's general admission requirements are discussed here.

The admission requirements will be basically the same as the existing ones for admission to the Ph.D. programs in Electrical Engineering and Computer Science. The entrance requirements are

- A master's degree in Computer Engineering or a closely associated discipline such as Electrical Engineering or Computer Science. Consideration will be given to highly qualified students wishing to pursue the doctorate without satisfying all of the requirements for a master's degree.
- GPA in graduate level course work of 3.5 or higher on a 4-point scale.
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

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Applicants must submit three letters of recommendation from individuals able to judge the candidate's probability of success in pursuing doctoral study. Applicants must also submit an essay outlining the candidate's background, education and professional goals.

Applicants must also submit a narrative describing their motivation for doctoral study and how it relates to their professional goals.

For students who are interested in a Ph.D. but are unable to attend school full-time, there is a part-time option. The guidelines for admission to the program and the degree requirements are the same as for full-time Ph.D. students. All students must have an academic adviser and an approved plan of study.

Degree Requirements

The University's general degree requirements are discussed here.

The program will require a minimum of 75 semester credit hours beyond the baccalaureate degree. These credits must include at least 30 semester hours of graduate level courses beyond the baccalaureate level in the major concentration. The core requirements for the Ph.D. degree in Computer Engineering are the same as the ones for the M.S. in Computer Engineering. All PhD students must demonstrate competence in the Master's level core courses in their research area. However, a student's supervising committee may impose course requirements that are necessary and appropriate for the student's research program. It is expected that M.S degree students planning to enter the proposed doctoral program will take most of the courses as part of their M.S. degree requirements. All students must have an academic advisor and an approved plan of study.

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Also required are:

- A research oriented oral qualifying examination (QE) demonstrating competence in the Ph.D. candidate's research area. A student must make an oral presentation based on a review of 2 to 4 papers followed by a question-answer session. Admission to Ph.D. candidacy is based on two criteria: Graded performance in the QE and GPA in graduate level organized courses. A student entering the Ph.D. program must pass the QE within five long semesters from the date of

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Item #12O

admission into the Ph.D. program. A student has at most two attempts at this qualifying exam. The exam will be given during the fall and spring semesters.

- A comprehensive exam consisting of: a written dissertation proposal, a public seminar, and a private oral examination conducted by the Ph.D. candidate's supervising committee.
- Completion of a major research project culminating in a dissertation demonstrating an original contribution to scientific knowledge and engineering practice. The dissertation will be defended publicly. The rules for this defense are specified by the Office of the Dean of Graduate Studies. Neither a foreign language nor a minor is required for the Ph.D. However, the student's supervisory committee may impose these or other requirements that it feels are necessary and appropriate to the student's degree program.

Dissertation

A dissertation is required and must be approved by the graduate program. A student must arrange for a dissertation advisor willing to guide this dissertation. The student must have a dissertation supervising committee that consists of no less than four members. The dissertation may be in computer engineering exclusively or it may involve considerable work in an area of application.

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Core requirements: ¶
The core requirements for the Ph.D. degree in Computer Engineering are the same as the ones for the M.S. in Computer Engineering. Candidates for the Ph.D. degree in Computer Engineering must also meet the following requirements, in addition to the dissertation:¶
<#>Pass a qualifying examination. ¶
<#>Take and pass sufficient CE electives for a total of at least 75 hours beyond the baccalaureate degree. The student is encouraged to consult with an advisor in choosing electives. ¶

Deleted: The minimum number of semester credit hours required for the proposed doctoral degree will be the same as the number of credit hours required by the existing doctoral degrees offered by the School of Engineering and Computer Science, i.e., 90 semester credit hours beyond a bachelor's degree in Computer Engineering or related field. These credits must include at least 30 semester hours of graduate level courses beyond the bachelor's degree and a doctoral dissertation. However, a student's supervising committee may impose course requirements that are necessary and appropriate for the student's research program. It is expected that M.S degree students planning to enter the proposed doctoral program will take most of the courses as part of their M.S. degree requirements.

Certificate in Evaluation Research

A graduate-level certificate program in Evaluation Research is offered jointly by the School of Economic, Political and Policy Sciences and Behavioral and Brain Sciences. Students who complete this program will have an opportunity to gain competencies in the design and implementation of program evaluations in fields such as education, health care, human services, criminal justice, and economic development. The Certificate in Evaluation Research program may be incorporated into graduate degree programs in the Schools of Social Sciences or Behavioral and Brain Sciences, or may be taken on its own by nondegree seeking students. Students in the Evaluation Research certificate program are normally expected to have completed undergraduate courses in social statistics and research design; students lacking appropriate preparation may be asked to take needed courses prior to admission to the program.

In order to receive the certificate, students must successfully complete four required courses and one guided elective, complete an evaluation research project including a final report, and participate in a weekly evaluation research seminar. The courses in the School of Social Sciences leading to the Certificate in Evaluation Research are POEC 5313 Descriptive and Inferential Statistics for the Social Sciences, POEC 6352 Evaluation Research Methods in the Social Sciences, POEC 6V91 Evaluation Research (six credit hours), and an additional course to be chosen from a list of guided electives available from the Social Sciences graduate advising office, for a total of 15 semester credit hours. With permission of the Evaluation Research program coordinator, students may substitute appropriate courses from the School of Behavioral and Brain Sciences or prior coursework taken at other institutions. Students interested in applying for admission to the Certificate in Evaluation Research program should consult the graduate advising office in the School of Social Sciences or the School of Behavioral and Brain Sciences.

Item #12Q

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: 10/21/2009
TO: GRADUATE DEAN
FROM: Bob Stillman
Please indicate with an X if your department catalog copy has no changes _____

SCHOOL_BBS_____

DEPARTMENT_COMD_____

BASIS FOR CATALOG CHANGES:

_____

NEW PROGRAMS/DEGREES/CERTIFICATES

Course numbering and changes in credit hour changes should be reflected in the two categories below.

NEW COURSES ADDED: COMD 7309

CHANGES IN CREDIT HOUR: COMD 7V68

COURSES DELETED: COMD 7367

CHANGES IN CREDIT HOUR: COMD 7368 (to COMD 7V68)

OTHER_____

Approved:_____
School/Department

Course Descriptions

Core Courses

ACN 6330 (HCS 6330, PSYC 6330) Cognitive Science (3 semester hours) Cognitive and neural processing approaches to understanding perception, attention, memory, thought, and language. (3-0) Y
ACN 6344 (HCS 6344, PSYC 6344) Functional Human Neuroanatomy (3 semester hours) Function of each major brain system as related to the organization and synaptic connections of their principal nuclei. Function of each system related to the neurological disorders associated with disease or lesions at specific locations. (3-0) T
ACN 6346 (HCS 6346, PSYC 6346) Systems Neuroscience (3 semester hours) Integrative systems level study of the nervous system. Aspects of neural mechanisms and circuitry underlying regulation of motor behaviors, sensory and perceptual processing, biological homeostasis, and higher cognitive functions. (3-0) Y
ACN 6395 (**HCS 6395, PSYC 6395) Cognitive Psychology** (3 semester hours) Theory and research on perception, learning, thinking, psycholinguistics, and memory. (3-0) Y

Deleted: ACN 7344 (HCS 7344, PSYC 7344) Functional Human Neuroanatomy (3 semester hours) Function of each major brain system as related to the organization and synaptic connections of their principal nuclei. Function of each system related to the neurological disorders associated with disease or lesions at specific locations. (3-0) T

Methods Courses

ACN 5314 (HCS 5314) Cognitive and Neural Modeling Lab (3 semester hours) Auto-associative, associative, competitive learning, recurrent, and back-propagation artificial neural network algorithms in a “hands-on” micro-computer laboratory environment using special simulation software. Applications to perceptual, cognitive, computational, and neuroscience problems. Emphasizes creative applications of these research methodologies. Prerequisites: Linear Algebra and Computer Programming Experience is recommended but not required. (3-0) T
ACN 6312 (HCS 6312, PSYC 6312) Research Methods in Behavioral and Brain Sciences - Part I (3 semester hours). Applying, understanding, and interpreting various statistical techniques in behavioral science context. Participants have the opportunity to learn appropriate statistical details for basic descriptive and inferential statistics, the interrelationships among techniques, and computer skills required for data analyses. (3-0) Y
ACN 6313 (HCS 6313, PSYC 6313) Research Methods in Behavioral and Brain Sciences - Part II (3 semester hours) Topics in general linear modeling including regression analysis correlation, simple analysis of variance, factorial analysis of variance, analysis of covariance, between and within subject designs, and multiple regression. Prerequisite: ACN/HCS 6312 or consent of instructor. (3-0) Y
ACN 6316 (HCS 6316, PSYC 6316) Research Methods in Behavioral and Brain Sciences—Part III (3 semester hours) Applying, understanding, and interpreting various advanced multivariate statistical techniques in brain and behavioral science contexts. Includes principle component analyses, simple and multiple correspondence analyses, partial least square regression, discriminant analyses, and structural equation modeling. (3-0) R
ACN 6319 (HCS 6319, PSYC 6319) Scientific Writing (3 semester hours) Scientific writing of articles for publication. (3-0) Y
ACN 6322 (HCS 6322) Computational Models of Language Understanding (3 semester hours). Probabilistic methods for natural language understanding. Use of the MATLAB computer language for instantiating specific knowledge-based computational theories of natural language understanding. Emphasizes creative applications of these research methodologies. Prerequisites: Computer Programming Experience is recommended but not required. (3-0) T
ACN 6341 Human Computer Interactions I (3 semester hours) Methods and principles of human-computer interaction (HCI), user-centered design (UCD), and useability evaluation. Provides broad overview of HCI and how HCI informs UCD processes throughout product development lifecycle. (3-0) T
ACN 6342 Human Computer Interactions II (3 semester hours) Detailed exploration of human-computer interaction (HCI) through readings in journal articles and research reports. Practical experience in methodology typically used in the design of usable systems. (3-0) T
ACN 6343 Human Computer Interactions Lab (3 semester hours) Provides students with resources to

learn and perform hands-on, lab-based techniques such as usability testing and cognitive walkthroughs. Emphasizes creative applications of these research methodologies as well as the development of critical thinking skills in a usability engineering context. (3-0) T

ACN 6347 (HCS 6347) Intelligent Systems Analysis (3 semester hours). Mathematical tools for investigating the asymptotic behavior of both deterministic and stochastic nonlinear dynamical systems. Topics include: artificial neural network architectures, Lyapunov stability theory, nonlinear optimization theory, stochastic approximation theory, and the Gibbs Sampler. Emphasizes development of advanced analytic skills and mathematical reasoning abilities. Prerequisites: ACN/HCS 6348 (or equivalent) or consent of instructor. (3-0) T

ACN 6348 (HCS 6348) Neural Net Mathematics (3 semester hours). Vector calculus and vector calculus-based probability theory with artificial neural network modeling applications. Emphasizes development of advanced analytic skills and mathematical reasoning abilities. Intended to provide mathematics preparation for ACN/HCS 6347 and ACN/HCS 6349. Prerequisites: *Either:* (1) Linear algebra, multivariable calculus, STAT 5351, ACN/HCS 5314, *or* (ii) consent of instructor. (3-0) T

ACN 6349 (HCS 6349) Intelligent Systems Design (3 semester hours) Mathematical tools for the design and evaluation of artificially intelligent deterministic and stochastic nonlinear dynamical systems for the purposes of building computational models in the fields of neuroscience, psychology, and artificial intelligence. Topics include Markov Random Field probability representations and asymptotic mathematical statistical theory for parameter estimation, model selection, and hypothesis testing. Prerequisites: ACN/HCS 6347 or consent of instructor. (3-0) T

ACN 6351 (HCS 6351) Quantitative Methods in Neuroscience (3 semester hours) Data analysis techniques relevant to neuroscience. Topics may include: fourier/wavelet analysis, differential equations, and statistical data analysis methods. May be repeated for credit with permission of the instructor. Prerequisite: ACN/HCS 6312 or consent of instructor (3-0) R

ACN 6372 (HCS 6372) The Neuroscience of Pain (3 semester hours) A systems-oriented course covering the anatomical and physiologic basis of pain. The course emphasizes the similarities and differences between the different forms of pain and describes the basic features of neural processing of pain signals in the spinal cord and brain, the anatomy and the function of the descending systems that can control transmission of pain signals, and peripheral and central sensitization. The physiological and molecular basis for treatment of pain is discussed. (3-0) Y

ACN 6373 (HCS 6373) Intraoperative Neurophysiological Monitoring I (3 semester hours). The anatomical and physiological basis for the use of electrophysiological techniques in intraoperative neurophysiologic monitoring and in diagnosis of disorders affecting the nervous system. (3-0) Y

ACN 6374 (HCS 6374) Intraoperative Neurophysiological Monitoring II (3 semester hours). The use of recordings of neuro-electric brain potentials and their interpretation for diagnostic purposes and for intraoperative monitoring. Prerequisite: One of the following: HCS/ACN 6346 Systems Neuroscience, HCS/ACN 6344 Functional Human Neuroanatomy, or HCS/ACN 6373. (3-0) Y

ACN 6399 (HCS 6399, PSYC 6399) Research Ethics and Scientific Integrity (3 semester hours) An interactive, intensive course designed to cover critical issues related to human subjects, animal welfare, research design, accountability of scientific actions and fraud. Course designed for individuals intending research careers in academia or industry. (3-0) Y

ACN 7324 (COMD 7324, AUD 7324) Seminar in Cochlear Implants and Technology for Persons with Hearing Impairments (3 semester hours) Overview of prosthetic alternatives to conventional amplification for individuals with severe-to-profound hearing loss. Topics include candidacy determination, technology, programming/fitting of devices, aural (re)habilitation, and awareness of controversial areas related to cochlear implantation. (3-0) Y

ACN 7335 (HCS 7333) Computational Neuroscience (3 semester hours) Introduction to state-of-the-art computer methods for simulation of biologically realistic neuronal dynamics. Students must demonstrate some degree of computer skills. (3-0) R

ACN 7367 (HCS 7367) Speech Perception Laboratory (3 semester hours) Introduction to the field of speech processing by computer, with primary application to research techniques in the study of speech perception. (0-9) T

Elective and Specialization Area Courses

Deleted: Pathophysiology of Disorders of the Nervous System (3 semester hours) The pathophysiology of disorders such as movement disorders and pain is discussed with emphasis on the role of neural plasticity in causing symptoms and signs. (3-0) Y

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Deleted: ACN 7322 (HCS 7322) Computational Models of Language Understanding (3 semester hours). Probabilistic methods for natural language understanding. Use of the MATLAB computer language for instantiating specific knowledge-based computational theories of natural language understanding. Emphasizes creative applications of these research methodologies. Prerequisites: Computer Programming Experience is recommended but not required. (3-0) T

Item #12R

Note that the following list only represents a subset of the possible approved elective and specialization area courses. Students in the Applied Cognition and Neuroscience program should select their elective and specialization area coursework in consultation with their faculty advisor or the ACN Program Head. All courses with an HCS (Human Development and Communication Sciences) prefix area are automatically approved elective courses. Coursework outside the School of Behavioral and Brain Sciences may also be approved as an appropriate elective course if special permission from the ACN Program Head is obtained.

ACN 6160 Neurobiology (1 semester hour) A self-paced course providing the neurobiological foundation for the study of speech-language pathology. This course may only be taken pass/fail. (Open to COMD students only) (1-0) R

ACN 6310 (HCS 6310) Fundamentals of Functional Brain Imaging (3 semester hours) This course covers topics such as principles of tracer techniques, neuroimaging instrumentation, safety issues, brain physiology (perfusion, metabolism, and receptor function), image processing and analysis, fundamentals of SPECT, PET and fMRI, and critical evaluation of the functional neuroimaging literature. (3-0) Y

ACN 6331 (HCS 6331, PSYC 6331) Cognitive Development (3 semester hours) Survey of cognitive development theories and research in a variety of domains including perception, memory, language, and problem solving. (3-0) Y

ACN 6332 (HCS 6332, PSYC 6332) Perception (3 semester hours) Psychophysical, neurophysiological, and computational foundations of sensation and perception. Basic senses of vision, audition, chemoreception, and tactile processing, with emphasis on understanding the processes that take us from neurons to perception and action. (3-0) R

ACN 6333 (HCS 6333, PSYC 6333) Memory (3 semester hours) Theoretical frameworks for knowledge acquisition and representation. Includes information processing and neuropsychological perspectives. (3-0) T

ACN 6334 (HCS 6334) Attention (3 semester hours) Theory and evidence on the study of attention especially in human vision and audition. Includes perceptual learning, information processing, and neuropsychological approaches. (3-0) R

ACN 6339 (HCS 6339, PSYC 6339) Psycholinguistics (3 semester hours) Classic and current research in psycholinguistics. Includes concepts from linguistics, the biological bases of speech and language processing, and child language acquisition. Hands-on exercises include labs on speech perception, language acquisition, and language comprehension. (3-0) R

ACN 6340 (HCS 6340) Cellular Neuroscience (3 semester hours) Basic neural biology and physiology and principles of synaptic transmission. (3-0) Y

ACN 6355 (HCS 6355, PSYC 6355) Judgment and Decision Making (3 semester hours) This course examines human inferences, judgments, decisions, and the processes by which we arrive at them. It will focus on the fact that our social judgments are not based on the laws of probability and chance, but on other cognitive processes that may have serious shortcomings in important inferential and decision-making tasks. We will also see that these processes, while ecologically efficient, systematic and often predictable, are imperfect in today's data-rich environment. (3-0) T

ACN 6363 (HCS 6363) Text Comprehension Seminar (3 semester hours) Current readings in the field of text comprehension and memory. May be repeated for credit with instructor's permission. (3-0) T

ACN 6367 (HCS 6367, PSYC 6367) Speech Perception (3 semester hours) Current topics and theories in speech perception. Topics include the acoustic correlates of speech sounds and the problem of invariance, the perception of speech under adverse conditions, the effects of hearing impairment, and models of speech perception. (3-0) T

ACN 6368 (HCS 6368, PSYC 6368) Language Development (3 semester hours) Advanced study of normal oral language development. Focus on research in child language and recent theories of language acquisition. Prerequisite: Consent of instructor. (3-0) Y

ACN 6V81 Special Topics in Applied Cognition and Neuroscience (1-9 semester hours) Topics vary from semester to semester. May be repeated for credit as topics vary. ([1-9]-0) S

ACN 7330 (HCS 7330) Advanced Functional Brain Imaging (3 semester hours) This course explores more in-depth topics such as neuroimaging detection systems, clinical applications of functional neuroimaging, experimental design, statistical techniques in image analysis and reviews of pertinent literature using functional brain imaging to illuminate various cognitive and perceptual processes, such as language, memory, hearing and vision. (3-0) R

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Deleted: ACN 6341 Human Computer Interactions I (3 semester hours) Methods and principles of human-computer interaction (HCI) , user-centered design (UCD) , and useability evaluation. Provides broad overview of HCI and how HCI informs UCD processes throughout product development lifecycle. (3-0) T

Deleted: Processes of human judgment will be examined from the perspective of cognitive, and social psychological theories and research. Focus is on specific domains of judgment, such as attitude formation and change, biases and prejudices, decision making in organizations, and marketing strategies to illustrate basic principles of decision making. (3-0) T

Item #12R

ACN 7343 (HCS 7343) Neuropharmacology (3 semester hours) Biology of neurotransmission in the central nervous system. Includes ionotropic and metabotropic coupling of all known classes of receptors to both their cellular and systemic effects. Clinical efficacy, side effects, and other issues related to drug use and abuse are covered. Prerequisite: Consent of Instructor or either: ACN/HCS 6340 or ACN/HCS 6346. (3-0) T

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Internship

ACN 7V71 Industry Internship May be repeated for credit. This course may only be taken pass/fail. ([1-6]-0) S

ACN 7V72 Research Internship May be repeated for credit. This course may only be taken pass/fail. ([1-6]-0) S

Item #12S

Course Descriptions

Many of the course descriptions in the School of Arts and Humanities are generic in nature. They define an area of inquiry and/or creative activity within the boundaries of which instructors offer courses on specific topics. Each semester the school makes available detailed descriptions of the specific courses to be offered during the next term. Moreover, the specific topics to be covered in generic courses will be listed with the course titles in the class schedules published by the university.

Arts and Technology Core Courses

ATEC 6300 Interdisciplinary Approaches to the Arts and Technology (3 semester hours) Introduction to the interdisciplinary study of mutual interactions between technology and the creative arts. Establishes basic theoretical concepts and principles underlying the graduate program in Arts and Technology. Required of all degree candidates in Arts and Technology. (3-0) Y

ATEC 6331 Aesthetics of Interactive Arts (3 semester hours) Exploration of aesthetic principles underlying the interactive electronic arts, their relation to and divergence from aesthetic principles underlying traditional forms of artistic expression. Topics will include interactive games, animation, and new modes of narrative. Required of all degree candidates in Arts and Technology. (0-3) Y

Arts and Technology Elective Courses

ATEC 6332 Design Principles (3 semester hours) Exploration of advanced design principles and practices common to most design professions. Topics include the language of design, core design concepts, analysis of design, and specialized design practices. (0-3) Y

ATEC 6333 Computational Design (3 semester hours) Exploration of the computational theory of design and the design of products and processes through digital means, such as computer graphics, animation, visualization, simulation, computer-aided design, and image processing. (0-3) Y

ATEC 6334 Information Design for New Media (3 semester hours) This course explores holistic discovery research and practice in the field of new media studies. Students will learn to uncover insights about user desirability, technological potential and possibility, data evaluation, value measures, and how to select ideas that have the greatest potential to ultimately invest, develop, and build new products and services. (0-3) T

ATEC 6335 Research in Sound Design (3 semester hours) Exploration of the relationship between sound, music, and the visual arts. This course covers the history of art and technology as applied to the domain of sound, with a special focus on interactive applications. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6341 Game Design (3 semester hours) Advanced study of the structure and design of digital, analog, narrative, and social game systems. Course focuses on theory, critical analysis, innovation, and prototype creation. (0-3) Y

ATEC 6342 Game Studies (3 semester hours) Advanced study of the computer game as cultural artifact, procedural system, social space, and artistic medium. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6343 Interactive Environments (3 semester hours) Exploration of design principles and practices for the creation of interactive experiential spaces. Course focuses on atmosphere, flow, interactivity, spatial narrative, and user experience. (May be repeated for credit as topic vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6345 Game Production Lab (3 semester hours) Exploration and application of advanced methods and techniques (literary, artistic, conceptual, and technical) involved in the development of interactive games. Includes participation in development team for creation of a prototype, vertical slice demo, or complete original game. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-3) T

ATEC 6351 Digital Arts (3 semester hours) Exploration and application of advanced methods and techniques for the creation of visual images through the use of digital media. (May be repeated as topics vary to a maximum of 6 credit hours.) (0-3) Y

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Deleted: Exploration and application of advanced methods and techniques (literary, artistic, conceptual, technical) involved in the development of interactive computer-based games. Includes participation in development team for creation of a complex computer game. (May be repeated to a maximum of 6 credit hours.)

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Item #12S

ATEC 6352 Motion Capture (3 semester hours) Exploration of advanced methods and techniques in motion capture animation. Course culminates in a professional-quality animation project. (May be repeated to a maximum of 6 credit hours.) (0-3) T

ATEC 6353 Visualization Research (3 semester hours) Exploration and application of advanced techniques in animation, visualization, simulation, and interactivity. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6354 Immersive Environments (3 semester hours) Advanced research in the conceptualization, creation, and application of interactive immersive environments, including research in synthetic spaces, interactive game engines, and hybrid physical/virtual worlds. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (0-3) T

ATEC 6355 Animation Production Lab (3 semester hours) Exploration and application of advanced concepts and techniques involved in the development of animated shorts and features. Includes participation in development team for creation of an animated short or feature-length animated film. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-3) T

ATEC 6361 Writing for Interactive Media (3 semester hours) Theory, principles and practice of narratives created for distribution via digital media. Will include creation of both linear and nonlinear digital content for electronic distribution. (May be repeated to a maximum of 6 credit hours.) (0-3) Y

ATEC 6371 Community Media (3 semester hours) Students develop local media that gives voice to people and issues in a particular community. Emphasis on personal, expressive media production that displays an authentic, personal voice. Students write and produce projects for Internet distribution using text, audio, video, interactive, and participatory elements. (0-3) T

ATEC 6372 Approaches to Emergent Media and Communications (3 semester hours) Focuses on the study of emergent media from a theoretical frame, exploring the political, technological, cultural and historical forces which inform the way media and communication develop. (3-0) T

ATEC 6373 Emerging Media Studio (3 semester hours) This course explores media production across multiple media. Students work in teams to develop meta-media projects in a variety of content delivery environments. Class will require students to develop a range of rhetorical (text, audio) and visual (image, video) strategies appropriate for emerging media. (May be repeated for credit to a maximum of 9 hours) (3-0) T

ATEC 6374 Digital Textuality (3 semester hours) This course will focus on understanding how representation and specifically writing has changed as mediums of writing have changed, paying special attention to the transformation from the analog to the digital. (3-0) T

ATEC 6375 Cyberpsychology (3 semester hours) Exploration of the underlying psychological issues of users that can be taken into account in the design and assessment of interactive technologies, such as online personas, virtual humans and cultures, brain-computer or human-robotic interfaces, virtual workplaces, and e-behavior. (3-0) T

ATEC 6376 E-Business Environment Design (3 semester hours) Students in this course will analyze underlying changes in societal structures fueled by a web-based economic environment, apply the effect of these societal paradigms to marketing, examine the effect of technology-driven societal structures on the workplace, and explore how the optimization of e-marketing and e-business environment designs can be used to reduce energy consumption. (3-0) T

ATEC 6382 Special Topics in Interactive Media (3 semester hours) Students in this course will explore how interactivity defines the degree to which digital artifacts (such as games, multimedia applications, products of all kind) are brought to life by their users. Topics may include interaction design, interface design, and research in anticipatory systems. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R

ATEC 6383 Special Topics in Sound Design (3 semester hours) Advanced research in digital music and sound design. Topics may include advanced visualization of music and sound, sonification of images, and advanced research in interactive sound applications. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R

ATEC 6384 Special Topics in Game Studies (3 semester hours) An examination of the links between technology, play, and culture. Topics may include the ethics of game development, serious and persuasive games, simulation and training, interactive education, identity and culture in virtual worlds, multilinear narrative, and philosophical origins of games as a medium. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R

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ATEC 6385 Special Topics in Animation (3 semester hours) Advanced research in animation, including concept development, character development, advanced techniques and methods in 2D animation, and animation production techniques. (May be repeated for credit to a maximum of 6 credit hours.) (0-3) R
ATEC 6390 Special Topics in Arts and Technology (3 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. or M.F.A. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R
ATEC 6397 Independent Readings in Arts and Technology (3 semester hours) (May be repeated for credit) (3-0) R
ATEC 6398 Independent Research in Arts and Technology (3 semester hours) (May be repeated for credit.) (3-0) R**ATEC 6V81 Special Topics in Emergent Communication** (1-9 semester hours) Explores current theories informing research on and practices in digital media and communication, such as distributed, mobile, time-shifted, interactive and personal media. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-[1-9]) T
ATEC 6V95 Advanced Project Workshop (3-6 semester hours) Students will engage in the creation of an advanced creative and/or research project exploring the interaction of the arts with digital technology. Required of all degree candidates in Arts and Technology. ([3-6]-0) Y**ATEC 7331 Research Methodology in Arts and Technology** (3 semester hours). This course presents students with a variety of research methods that are appropriate for advanced research in Arts and Technology. Methods will include ethnographic, experimental, descriptive, historical, and philosophical. (3-0) R

ATEC 7V81 Advanced Project Workshop (3-6 semester hours) Students will engage in the creation of an advanced creative and/or research project exploring the interaction of the arts with digital technology. ([3-6]-0) R
ATEC 7V82 Advanced Projects in Interactive Media (1-9 semester hours) Students will complete an advanced creative and/or research project exploring the interaction of communication and digital technology. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-[1-9]) R
ATEC 7390 Special Topics in Arts and Technology (3 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. or M.F.A. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R
ATEC 8303 Independent Readings in Arts and Technology (3 semester hours) (May be repeated for credit) (3-0) R
ATEC 8305 Independent Research in Arts and Technology (3 semester hours) (May be repeated for credit.) (3-0) R

Emerging Media and Communication Core Courses

EMAC 6300 Introduction to the Study of Emerging Media and Communication (3 semester hours) Introduction to interdisciplinary study of the implications of interactive technology for the creation, dissemination and impact of communication. Establishes basic theoretical concepts and principles underlying the graduate program in Emerging Media and Communication. (3-0)Y
EMAC 6374 (ATEC 6374) Digital Textuality (3 semester hours) This course will focus on understanding how representation and specifically writing has historically changed, paying special attention to the transformation from the analog to the digital. (3-0) Y

Emerging Media and Communication Elective Courses

EMAC 6361 (ATEC 6341) Writing for Interactive Media (3 semester hours) Theory, principles, and practice of narratives created for distribution via digital media. Will include creation of both linear and nonlinear digital content for electronic distribution. (May be repeated to a maximum of 6 credit hours.) (0-3) Y
EMAC 6371 (ATEC 6371) Community Media (3 semester hours) Students develop local media that gives voice to people and issues in a particular community. Emphasis on personal, expressive media

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production that displays an authentic, personal voice. Students write and produce projects for Internet distribution using text, audio, video, interactive, and participatory elements. (0-3) T

EMAC 6372 (ATEC 6372) Approaches to Emergent Media and Communication (3 semester hours) Focuses on the study of emergent media from a theoretical frame, exploring the political, technological, cultural, and historical forces which inform the way media and communication develop. (3-0) T

EMAC 6373 (ATEC 6373) Emerging Media Studio I (3 semester hours) Explores media production across multiple media. Students work in teams to develop meta-media projects in a variety of content delivery environments. Class will require students to develop a range of rhetorical (text, audio) and visual (image, video) strategies appropriate for emerging media. (May be repeated for credit as topics vary to a maximum of 9 hours) (0-3) T

EMAC 6383 Emerging Media Studio II (3 semester hours) Advanced collaborative workshop devoted to the creation of sophisticated communications employing multiple media platforms. (May be repeated for credit to a maximum of 9 credit hours.) (0-3) T

EMAC 6V81 Special Topics in Emergent Communication (1-9 semester hours) A course dedicated to current issues, research problems, and special projects in emerging media and communication. Topics will vary and may include distributed, mobile, time-shifted, interactive and personal media. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (0-[1-9]) T

EMAC 6V91 Advanced Project Workshop (3-6 semester hours) Students propose, develop and execute an advanced creative and/or research project exploring the Emerging Media and Communication. This course is required of all degree candidates in Emerging Media and Communication. ([3-6]-0) Y

History Core Course

HIST 6301 Historiography (3 semester hours) Graduate-level introduction to the practice and forms of written history. Required of all students in the M.A. program in History, this course examines the ways in which historians have conceived of their craft, the centrality of interpretation to the historical process, and the use of a variety of methods and theories in the study of the past. (3-0) Y

History Elective Courses

HIST 6310 Early American History (3 semester hours) The study of specific themes and/or periods in American history through the American Revolution. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HIST 6320 America in the Nineteenth Century (3 semester hours) The study of specific themes and/or periods in American history in the nineteenth century. Topics may include the Civil War and Reconstruction. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HIST 6324 Gilded Age & Progressive Era (3 semester hours) The study of social, political, and economic life in the period between 1877 and 1919. Special attention to the relationship between government and society. (3-0) T

HIST 6325 America in the Twentieth Century (3 semester hours) The study of specific themes and/or periods of American history in the twentieth century. Topics may include World War I, World War II, and the Civil Rights Era. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HIST 6326 U.S. Foreign Relations (3 semester hours) The study of U.S. diplomatic relations with Asia, Africa, Europe, Latin America, the Middle East, and Soviet Russia in the twentieth and twenty-first centuries. (3-0) T

HIST 6327 U.S. Since 1945 (3 semester hours) The study of the political, economic, social, and cultural development of the United States since the end of World War II. (3-0) T

HIST 6330 Regional and Area History in the United States (3 semester hours) The study of themes related to the history of specific regions of the United States, for example the South, the Southwest, and Texas. Topics may vary. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) T

HIST 6332 Slavery in America (3 semester hours) The study of the origins, evolution, growth and destruction of racial slavery in America from 1619-1865. (3-0) T

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Deleted: EMAC 7301 (ATEC 7301) Digital Textuality (3 semester hours) This course will focus on understanding how representation and specifically writing has historically changed, paying special attention to the transformation from the analog to the digital. (May be repeated for credit to a maximum of 6 hours) (3-0) T

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HIST 6333 Rise of the Jim Crow South (3 semester hours) The study of the origins of segregation and disfranchisement in the New South. Explores historiographical debates about the nature and meaning of Jim Crow. (3-0) T
HIST 6335 U.S. Women (3 semester hours) The study of recent historiography, current methods, and major themes in U.S. women's and gender history. (3-0) T
HIST 6340 European and World History (3 semester hours) The study of specific themes and/or periods in the history of Europe and the world. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HIST 6350 Asian History (3 semester hours) The study of specific themes and/or periods in the history of Asia. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6360 Latin American History (3 semester hours) The study of specific themes and/or periods in the history of Latin America. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6365 Mexican History (3 semester hours) The study of specific themes and/or periods in the history of Mexico. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6370 Middle Eastern History (3 semester hours) The study of specific themes and/or periods in the history of the Middle East. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HIST 6390 Topics in History (3 semester hours) The study of specific themes and/or periods in history. (May be repeated for credit as topic vary to a maximum of 9 hours.) (3-0) R**HIST 6395 Special Topics in History** (3 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R
HIST 6397 Independent Readings in History (3 semester hours) (May be repeated for credit.) (3-0) R
HIST 6398 Independent Research in History (3 semester hours) (May be repeated for credit.) (3-0) R
HIST 6399 Master's Thesis (3 semester hours) (May be repeated for credit but only 6 hours will be counted toward M.A.) (3-0) R

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Humanities Core Courses

HUMA 6300 Interdisciplinary Approaches to the Arts and Humanities (3 semester hours) Introduction to interdisciplinary approaches to the arts and humanities, including concepts of inquiry and interpretation that form the theoretical bases of the graduate programs, seminars, workshops, and studios. Required of all degree candidates for the Master of Arts, Master of Arts in Teaching, and Doctor of Philosophy in Humanities. (3-0) S
HUED 5300 (ED 5300) The Interdisciplinary Teaching of the Arts and Humanities in the Secondary School (3 semester hours) Approaches to the interdisciplinary teaching of the arts and humanities at the secondary level. Each student will design a curriculum unit to be taught from an interdisciplinary perspective. Required of students seeking the Master of Arts in Teaching. (3-0) Y
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Humanities Elective Courses

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Aesthetic Studies

HUAS 6303 Performance Literature, Theory, and Criticism (3 semester hours) Examination of a wide range of performance and theatrical traditions and texts. Using various critical and theoretical perspectives, the focus will be on the interplay between textual analysis, theoretical and critical frames, and performance. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T
HUAS 6305 Criticism, Interpretation, and Performance (3 semester hours) An investigation of the interrelationship among the activities of criticizing, interpreting, and performing artistic texts. Examples may be drawn from literature, theater, performance art, web and inter-media applications, film/video, music, and the visual arts. The course will include an exploration of the effects of various cultural and theoretical perspectives on our response to specific works. (3-0) T

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HUAS 6310 Introduction to Film Studies (3 semester hours) Study of the history and formal and stylistic elements of cinema as a medium of expression, as an industry, and as an art form; and an introduction to the tenets and theoretical basis of the academic discipline known as film studies. (3-0) T

HUAS 6312 Art and Society (3 semester hours) Study of the many forms of interaction between the arts and the society in which they exist. Topics may include the role of the artist in society, the representation of social and religious values in art, or the influence of art and the artist upon society. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6313 The Business of the Arts (3 semester hours) Exploration of effective means to find, create, and manage markets and audiences for works of art. Topics may include digital media, visual or performing arts, museum studies, and arts management. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6315 The Arts in Historical Contexts (3 semester hours) Studies in one or more arts of various places and historical periods. Topics will vary, but may focus on a particular movement (e.g., Surrealism), a specific era (e.g., the Renaissance), or a place (e.g., Paris in the early twentieth century). (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) Y

HUAS 6317 Art and Authorship (3 semester hours) Study of the role of the maker in the creation of art. Topics vary but may include visual artists, filmmakers, composers, writers, or other artists. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6318 The Arts and Their Institutions (3 semester hours) Studies of the institutions that shape and present the visual and performing arts by providing their physical, administrative, and financial "frames": art museums, theaters, symphony associations, performance consortiums, or private foundations. The course will focus selectively on these institutions, grouping them for study in various ways depending on the interests and expertise of the instructor. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6320 Studies in Experimental Traditions (3 semester hours) Studies in the works of artists whose experimentation with forms of expression breaks new ground in the arts and demands changes in the aesthetic perception of the public. The course will focus on such experimental movements as modernism, postmodernism and various avant-gardes that form the new tradition of the contemporary arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6324 Spaces of Display and Performance (3 semester hours) Usually art works and performances are encountered in specific ritualized spaces designed for them and exerting strong influence on their character. The course will address such spaces critically from the point of view of architecture, theories of display, and concepts of ritual spectatorship. (3-0) T

HUAS 6330 Studies in the Visual Arts (3 semester hours) Explorations in various forms of the visual arts. The course may focus on a specific form (e.g., painting, sculpture, film, photography) or interrelations among visual forms. Emphasis will be on the understanding of the creative process underlying the finished work. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6331 Studies in Music (3 semester hours) Studies in forms of musical expression. Topics will vary, but the course will emphasize the nature, development, and artistic possibilities of various forms of music. Courses may relate music to developments in other arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6333 Advanced Orchestra/Chamber Music Ensemble (3 semester hours) Workshop in which instrumentalists, singers, dancers, actors, composers, lyricists, visual artists and/or video/performance artists create and perform music for small and larger ensembles, plus multi-media and theater works. (May be repeated for credit to a maximum of 9 credit hours.) Permission of instructor required. (3-0) T

HUAS 6334 Iberian Culture and Music (3 semester hours) Study of the transfer of music and culture between Spain, Portugal, and the countries of the Americas which had close connections to the Iberian countries via language, culture, and commerce. (3-0) T

HUAS 6336 Photography Studio/Seminar (3 semester hours) Workshop-based course designed to foster reflection on the relationship between human perception and the photographic mediation of reality. The course may emphasis photographic processes or conceptual frameworks. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6337 Digital Photography (3 semester hours) Workshop in which students explore digital photography within the context of contemporary art, emphasizing the relationship between digital imaging

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processes and color photographic techniques. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) T

HUAS 6339 Painting/Digital Imaging/Video (3 semester hours) Workshop in which students will pursue creative work in a medium of their preference or expertise (can include painting, drawing, digital imaging, video or hybrid forms). (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6340 Studies in Theater and Dance (3 semester hours) An investigation of theater, performance art, inter-media, and/or dance as forms of art. The course will relate to and incorporate trends in other arts and contemporary intellectual and cultural movements, theories and critical issues. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 6345 Shakespeare in Performance (3 semester hours) Studies of Shakespeare's plays, examining varied artistic and scholarly interpretations in film and performance. The course will blend lectures, discussions, and practical skill-based exercises and may include scholarly and/or creative projects. Meant for aspiring writers, actors, directors, and teachers, with or without experience in performing. Topics may vary. (May be repeated for credit to a maximum of 6 semester hours.) (3-0) T

HUAS 6347 Solo Performance (3 semester hours) Workshop in which students explore aspects of devising, writing and performing solos, with an emphasis on developing work in multiple genres, media, and formats. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6348 Performance Installation (3 semester hours) An exploration of the theory, history, and practice of employing installation and performance art with technology as a means of extending personal artistic practice. Emphasis will be on practical experience in the conceptualization and production of collaborative, experimental, trans-disciplinary artistic expression. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6350 Creating Poetry (3 semester hours) An investigation in a workshop environment of the aesthetics of the art and creation of poetry, focusing on the creative techniques and processes involved in producing poems and song lyrics in a variety of formalist, free verse, and experimental forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6351 Creating Novels (3 semester hours) An investigation in a workshop environment of the aesthetics of the art and creation of the novel, focusing on the creative techniques and processes involved in producing novels in a variety of lyrical, experimental, and traditional forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6352 Creating Television and Movie Scripts (3 semester hours) An investigation in a workshop environment of the aesthetics of art and creation of movie, multimedia, video, and television scripts, focusing on the creative techniques and processes involved in producing scripts in a variety of experimental and traditional forms that combine verbal, written art with acting, filmmaking, and production. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6353 Creating Plays and Musicals (3 semester hours) An investigation in a workshop environment of the aesthetics of art and creation of drama, focusing on the creative techniques and processes involved in producing plays and musicals in a variety of experimental and traditional forms that combine verbal, written art with the musical and dramatic arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6354 Creating Short Fictions (3 semester hours) An investigation in a workshop environment of the aesthetics of the art and creation of the short story and the novella, focusing on the creative techniques and processes involved in producing short stories in a variety of experimental and traditional forms that combine verbal, written art with the visual and performing arts. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6355 Creating Nonfictions (3 semester hours) This workshop will draw from one or several nonfiction genres such as portraiture, historical accounts, essays, biography, and autobiography and will show how they are realized using techniques by the creation of art. Topics may vary but may include visual artists, filmmakers, composers, or other artists. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6373 Studies in Film, Television, and Digital Media (3 semester hours) Study of aspects of motion picture history, criticism, and aesthetics. Topics may include genre study; documentary practices; national cinemas or movements; theories of reception; or comparisons of these and other art forms. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

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HUAS 6375 Imagery and Iconography (3 semester hours) The study of the visual image and its use. Topics may include the nature of the visual image, our perception and interpretation of visual images, the relation of the visual to the verbal image, and the ways in which visual images are used in art to shape our imagination. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6377 Critical Theory and the Visual Arts (3 semester hours) A mapping of the relations between the visual arts and new critical theories from structuralism to post-structuralism. Focus will vary but may include semiotics, deconstruction, feminism, or psychoanalysis. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUAS 6380 Creating Poetry: Intermediate (3 semester hours) An intensive investigation into the forms (both ancient and modern), theories, and creations of poetry in a workshop environment that will focus on the creative techniques and processes involved in producing formalist, lyrical, free verse, and experimental poetry. Permission of the instructor and previous completion of HUAS 6350 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6381 Creating Fiction: Intermediate (3 semester hours) An intensive investigation into the theories, aesthetics, and creation of fiction in a workshop environment that will focus both on structure and on creative techniques and creative process involved in producing sophisticated, challenging, and linguistically developed fictions. The course may emphasize the short story, novel, or novella. Permission of the instructor and previous completion of HUAS 6351 or HUAS 6354 are required. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6383 Creating Scripts: Intermediate (3 semester hours) An intense investigation of the theory, history, aesthetics, art, and creation of play, movie, and television scripts in a workshop environment that will focus on the creative techniques and processes involved not only in the creation of film, play, and television scripts, but also in the production of plays, films, and television episodes. Permission of the instructor and previous completion of either HUAS 6352 or HUAS 6353 required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6385 Creating Nonfictions: Intermediate (3 semester hours) An intensive investigation into the theory, aesthetics, and creation of biographies, autobiographies, and historical accounts in a workshop environment that will explore the boundaries between fiction and non-fiction and between art and reality. Permission of the instructor and previous completion of HUAS 6355 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6390 Special Topics in Aesthetic and Performance Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the M.A. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

HUAS 6391 Creativity: Visual Arts Workshop (3 semester hours) A workshop emphasizing the creation of artistic works in a specific area of the visual arts (e.g., painting, drawing, photography, sculpture). Topics, such as narrative representation or the study of a genre, are explored to examine the theoretical basis guiding practice. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours). (3-0) Y

HUAS 6392 Creativity: Image/Text Workshop (3 semester hours) An exploration of the visual possibilities inherent in the art of the text. Topics may include an investigation of techniques derived from various media that foster the transformation and combination of words and images. The problem of creating text for a visual environment will be examined. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6393 Creativity: Time-Based Arts Workshop (3 semester hours) Exploration of the conceptual demands inherent in time-based visual art. Topics may include interactive visual arts, installation, kinetic art, computer animation, and video processes. The potential of narrative models may be examined. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 6394 Creativity: Performance (3 semester hours) A skills-based course intended to enable the exploration, development, and realization of a performance expression. Project-focused, the course may include playwrighting, adaptation of non-dramatic or oral history sources, or be guided by specific text(s), improvisation, inter-cultural or inter-media explorations. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) Y

HUAS 6397 Independent Readings in Aesthetic and Performance Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUAS 6398 Independent Research in Aesthetic and Performance Studies (3 semester hours) (May be repeated for credit.) (3-0) R

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HUAS 6396 Creating Nonfictions (3 semester hours) This workshop will draw from one or several nonfiction genres such as portraiture, historical accounts, essays, biography, and autobiography and will show how they are realized using techniques by the creation of art. Topics may vary but may include visual artists, filmmakers, composers, or other artists. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

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HUAS 6399 Music in Historical Context (3 semester hours) Study of music in society: dates, periods, genres, style characteristics, major figures, representative masterworks, political/economical/social climate, corollaries in literature, theatre, visual art. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUAS 6608 Performance Training (6 semester hours) Intensive workshop-based course focusing on training and performance techniques to develop skills and methods for creating new performance. Activities include physical and vocal training, performance games and exercises, and will focus on methods, strategies, and processes of creation. Special attention to the performer's relation to' text' exploration and evolution. (May be repeated for credit to a maximum of 12 credit hours.) (6-0) T

HUAS 6609 Music Performance (6 semester hours) Applied study of instrumental/vocal techniques, interpretation, repertoire building and performance practice. (May be repeated for credit to a maximum of 12 credit hours) (6-0) T

HUAS 7305 Advanced Topics in Art History (3 semester hours) Advanced studies in one or more arts of various places and historical periods. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 7320 Advanced Topics in the Visual Arts (3 semester hours) Advanced explorations in various forms of the visual arts. The course may focus on a specific genre or form or on interrelations among visual forms. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 7330 Advanced Topics in Music (3 semester hours) Advanced studies in forms of musical expression. The course will emphasize the nature, development, and artistic possibilities of various forms of music. Courses may relate music to developments in other arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUAS 7340 Advanced Topics in Theater and Dance (3 semester hours) Advanced investigation of theater, performance art, inter-media, and/or dance as forms of art. The course will relate to and incorporate trends in other arts and contemporary intellectual and cultural movements, theories and critical issues. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7350 Advanced Topics in Creative Writing (3 semester hours) Advanced investigation of the theory, history, aesthetics, art, and creation of creative writing in a workshop environment. The course may focus on poetry, short stories, scripts or other genres. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T**HUAS 7355 Interdisciplinary Studies in Music** (3 semester hours) Study of music in relation to one or more of the other arts/disciplines: literature, theatre, dance, visual art, cinema, history, psychology, technology, etc. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUAS 7360 Advanced Topics in Film, Television, and Digital Media (3 semester hours) Advanced study of particular aspects of motion picture history, criticism, and aesthetics. Topics may include genre study; documentary practices; national cinemas or movements; theories of reception; or comparisons of these and other art forms. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) T

HUAS 7380 Advanced Topics in Aesthetic Studies (3 semester hours) Advanced study of particular themes, topics, and issues in the various disciplines that constitute aesthetic studies. (May be repeated as topics vary for credit to a maximum of 9 credit hours.) (3-0) R

HUAS 7390 Advanced Special Topics in Aesthetic and Performance Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

HUAS 7601 Advanced Music Performance (6 semester hours) Applied study of advanced instrumental/vocal techniques, interpretive insights, repertoire building and historical performance practice. (May be repeated for credit to a maximum of 12 credit hours) (6-0) T

HUAS 8303 Independent Readings in Aesthetic and Performance Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUAS 8305 Independent Research in Aesthetic and Performance Studies (3 semester hours) (May be repeated for credit.) (3-0) R

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HUAS 7304 Critical Theory and the Visual Arts (3 semester hours) A mapping of the relations between the visual arts and new critical theories from structuralism to post-structuralism. Focus will vary but may include semiotics, deconstruction, feminism, or psychoanalysis. (May be repeated for credit to a maximum of 9 credit hours.)(3-0)T
HUAS 7310 Art and Authorship (3 semester hours) The study of the role of the maker in the creation of art. Topics vary but may include visual artists, filmmakers, composers, writers, or other artists. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

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HUAS 7350 Creating Nonfictions: Advanced (3 semester hours) An intensive investigation into the theory, aesthetics, and creation of biographies, autobiographies, and historical accounts in a workshop environment that will explore the boundaries between fiction and non-fiction and between art and reality. Permission of the instructor and previous completion of HUAS 6396 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7351 Creating Short Stories: Advanced (3 semester hours) An intensive investigation into the theories, aesthetics, and creation of the short story in a workshop environment that will focus both on structure and on creative techniques and creative process involved in producing sophisticated, challenging, and linguistically developed short stories. Permission of the instructor and previous completion of HUAS 6395 are required. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7352 Creating Poetry: Advanced (3 semester hours) An intensive investigation into the forms (both ancient and modern), theories, and creations of poetry in a workshop environment that will focus on the creative techniques and processes involved in producing formalist, lyrical, free verse, and experimental poetry. Permission of the instructor and ... [1]

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HUHI 6300 History of Early Modern Thought (3 semester hours) Introduction to and examination of the authors and texts influential in shaping Western culture through the eighteenth century. The course will treat philosophy as well as social, political, and religious thought during particular periods. (May be repeated for credit as topics vary to a maximum of 6 hours.) (3-0) T

HUHI 6301 History of Modern Thought (3 semester hours) Introduction to and examination of the authors and texts influential in shaping modern Western culture since 1800. The course will treat philosophy as well as social, political, and religious thought during particular periods. (May be repeated for credit as topics vary to a maximum of 6 hours.) (3-0) T

HUHI 6305 Ideas In Contexts (3 semester hours) The study of an idea or ideas as developed in specific cultural circumstances, for example, the idea of revolution considered in theory as well as in its actualization in the American Revolution, the French Revolution, the Bolshevik Revolution, Maoism, etc. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6313 Thought, Culture, and Society in Europe (3 semester hours) Themes in the intellectual and cultural life of European societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6314 Thought, Culture, and Society in the United States (3 semester hours) Themes in the intellectual and cultural history of the United States. The course will focus on the writings of key thinkers chosen from different periods and on placing these writings within their intellectual and social contexts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6315 Thought, Culture, and Society in Latin America (3 semester hours) Themes in the intellectual and cultural life of Latin American societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUHI 6320 Perceptions of the Past (3 semester hours) Approaches to perceiving, reconstructing, appreciating, and analyzing the past. Formal historiographical methods, the fictionalization of the past, or the understanding of memory and nostalgia may be emphasized. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6323 Space, Time, and Culture (3 semester hours) The study of the relationship between changing philosophic and scientific concepts of space and time and forms of cultural expression such as art, literature, and music. (3-0) T

HUHI 6325 Movements in Thought and Culture (3 semester hours) The study of movements in thought and culture through a variety of perspectives, but emphasizing their intellectual bases: e.g., the Enlightenment, Romanticism, etc. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6327 Artist and Writer in Society (3 semester hours) Inquiries into the role of creative artists (e.g., painters, sculptors, musicians, writers, filmmakers) in various places and times. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6329 Philosophical Issues and the Humanities (3 semester hours) An investigation of the ways the humanities contribute to an understanding of such philosophical problems as hermeneutics, moral education, life and death, race, gender and sexual orientation, and the environment. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6332 European Enlightenment (3 semester hours) The study of the European intellectual movement of the Enlightenment, its precursors and consequences. (3-0) T

HUHI 6334 Exploring Urban Cultures (3 semester hours) The study of the European cities of Berlin, Paris, and London from the mid-nineteenth through the early twentieth century. (3-0) T

HUHI 6335 Modern Jewish Thought (3 semester hours) Study of modern and contemporary Jewish thought, with an emphasis on the relationship between Judaism and philosophy. (3-0) T

HUHI 6336 Modernity, Culture, and the Jews (3 semester hours) The study of the role of Jews in the creation of modern culture, with emphasis on Jewish participation as an area of interaction, exchange, and encounter. (3-0) T

HUHI 6337 Moving Pictures in Jewish Culture and Thought (3 semester hours) The study of the role of Jews in the movie industry from the silent era to contemporary Hollywood production. (3-0) T

HUHI 6338 The Holocaust (3 semester hours) An examination of the event, its background and consequences, with emphasis on the political, psychological, theological, and artistic responses it has engendered. (May be repeated for credit to maximum of 6 credit hours.) (3-0) Y

HUHI 6340 Readings in American Culture (3 semester hours) An examination of the ways in which Americans have defined themselves, and been defined by others, over time. Works read will be drawn

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from a variety of genres and may include studies of myth and symbol. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6341 American Intellectual History (3 semester hours) The study of American thought from the seventeenth century to the present, with a focus on philosophy, political thought, and social thought. (3-0) T

HUHI 6342 American Political Cultures (3 semester hours) An inquiry into the development of political cultures in the United States since the late eighteenth century. Emphasis on how the apparatus of the state (courts, legislatures, elections, schools, asylums, the military) has provided formal frameworks for ongoing cultural contests among diverse Americans over the meanings of citizenship, family, work, property, nature, health, and privacy. (3-0) T

HUHI 6343 The American Experience in Vietnam (3 semester hours) The study of the reaction and response of American society to the political, military, and cultural turmoil engendered by the Vietnam War. (3-0) T

HUHI 6344 The 1960s (3 semester hours) The study of the "Long Decade" of the 1960s, from Elvis to the fall of Richard Nixon. The course will analyze political, economic, social, and cultural developments. (3-0) T

HUHI 6345 The Woman Question (3 semester hours) The study of how particular cultures and/or thinkers have defined the "woman question." Subjects may include particular geographical regions, major literary or historical movements and events. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUHI 6346 New Directions in Southern Studies (3 semester hours) The study of how scholarship on the U.S. South has begun to push the conventional boundaries of the discipline through its focus on the categories of race, gender, sexuality, and transnationalism. (3-0) T

HUHI 6347 Topics in Feminist Philosophy (3 semester hours) Examination of various topics in metaphysics, ethics, philosophy of science, philosophy of language, philosophy of mind, or philosophy of religion from feminist perspectives. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUHI 6348 Thought, Culture, and Society in Asia (3 semester hours) Themes in the intellectual and cultural life of Asian societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUHI 6349 Thought, Culture, and Society in the Middle East (3 semester hours) Themes in the intellectual and cultural life of Middle Eastern societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUHI 6395 Topics in the History of Ideas (3 semester hours) Topics in philosophy, intellectual and/or cultural history. (May be repeated for credit as topics vary to a maximum of 9 hours.) (3-0) R

HUHI 6396 Historical Inquiry (3 semester hours) A leveling course for graduate students with little background in the field as an advanced introduction to historical study and the history of ideas. (3-0) R

HUHI 6397 Independent Readings in History of Ideas (3 semester hours) (May be repeated for credit.) (3-0) R

HUHI 6398 Independent Research in History of Ideas (3 semester hours) (May be repeated for credit.) (3-0) R

HUHI 6399 Special Topics in the History of Ideas (3 semester hours) Independent studies course that may count toward minimum course requirements for the M.A. degree. (May be repeated for credit as topics vary to a maximum of 9 hours.) (3-0) R

HUHI 7313 Advanced Topics in U.S. Thought, Culture, and Society (3 semester hours) Advanced topics in the intellectual and cultural history of the United States. The course will focus on key thinkers, ideas, schools of thought, or cultural beliefs chosen from different periods and understood within their intellectual and social contexts. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUHI 7314 Advanced Topics in European Thought, Culture, and Society (3 semester hours) Advanced topics in the intellectual and cultural life of European societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUHI 7315 Advanced Topics in Thought, Culture, and Society (3 semester hours) Advanced topics in intellectual and cultural history. The course may focus on different themes, periods, and geographical areas. (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

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HUHI 7330 The History of Hermeneutics (3 semester hours) Studies in the history of hermeneutics as a biblical-philological method and its transformation by the modern German tradition into a philosophical approach to language and experience. Focus on the work of Schleiermacher, Dilthey, Heidegger, and Gadamer. (3-0) T

HUHI 7332 Topics in Recent Continental Philosophy (3 semester hours) Close textual study of the works of leading continental philosophers such as Nietzsche, Derrida, Foucault, Heidegger, Husserl, and others. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) R

HUHI 7335 Philosophical Topics in the Analytic Tradition (3 semester hours) Examination of philosophical issues arising from or inspired by the works of Russell, Wittgenstein, Frege, Carnap, and their heirs, including Popper, Quine, and Sellars. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) R

HUHI 7340 New Currents in the History of Ideas (3 semester hours) Exploration of significant recent approaches that represent major disciplinary and interdisciplinary contributions to the field. With emphasis on theory and method, focus falls upon critical study of new interests that include "new" social and cultural histories, mentalities, poststructuralism, feminism, critical theory, institutionalist history, hermeneutics, among others. (May be repeated for credit as topics vary to maximum of 6 credit hours.) (3-0) R

HUHI 7368 Topics in Thought and Society (3 semester hours) Studies in ideas, institutions, and applied history. The approach may be comparative or limited to a single cultural or geographical area. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUHI 7387 Science and Technology in Western Culture (3 semester hours) Topics will vary but may include consideration of the philosophical or historical basis for the evolution of scientific thought; the problem of conceptual change in the study of the fundamental character of technology and its impact on culture. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) R

HUHI 7391 Women in European Society (3 semester hours) A historical examination of the varied experiences of European women, focusing on work, family life, political action, sexuality, and cultural expression. May emphasize early modern or modern period. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) R

HUHI 7393 Feminist Methodologies (3 semester hours) An investigation of the various types of feminist methodologies and their application to philosophical and historical issues. Methodologies to be addressed may include Marxist and socialist feminism, phenomenological feminisms, liberal feminism, and radical feminism. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) R

HUHI 7397 Women in American Society (3 semester hours) A historical examination of the varied experiences of American women, focusing on work, family life, political action, sexuality, and cultural expression. May emphasize early modern or modern period. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) R

HUHI 7399 Advanced Special Topics in the History of Ideas (3 semester hours) Independent studies course that may count toward minimum course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUHI 8303 Independent Readings in History of Ideas (3 semester hours) (May be repeated for credit.) (3-0)R

HUHI 8305 Independent Research in History of Ideas (3 semester hours) (May be repeated for credit.) (3-0)R

Studies In Literature

HUSL 6304 Studies in Literary Themes (3 semester hours) Examinations of specific themes as they appear in various literary works and traditions. Themes considered in courses may include love, heroism, feminism, the anti-hero, or revolution. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6308 Studies in Literary Forms and Genres (3 semester hours) Studies in various literary genres, either individually or in relation to each other. Among topics considered will be the difficulties of defining genres, the nature of specific genres, their historical and aesthetic development, and their artistic possibilities. Genres for discussion may include tragedy, comedy, the novel, and various forms of poetic expression. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) Y

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HUHI 7355 Perceptions of the Past (3 semester hours) Approaches to perceiving, reconstructing, appreciating, and analyzing the past. Formal historiographical methods, the fictionalization of the past, or the understanding of memory and nostalgia may be emphasized. (3-0) T

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HUHI 7379 Philosophical Issues and the Humanities (3 semester hours) An investigation of the ways the humanities contribute to an understanding of such philosophical problems as hermeneutics, moral education, life and death, race, gender and sexual orientation, and the environment. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

HUHI 7386 Artist and Writer in Society (3 semester hours) Inquiries into the role of creative artists (e.g., painters, sculptors, ... [2]

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HUSL 6309 Literary Movements (3 semester hours) Studies in the nature of intellectual and artistic movements, with emphasis on how they affect literary expression. Examples of such movements are romanticism, naturalism, modernism, and postmodernism. (May be repeated for credit as topics vary to a maximum of 9 credit hours). (3-0) Y

HUSL 6310 Studies in Literary Interpretation (3 semester hours) Study of the issues involved in the attempt to interpret dramatic, poetic, and fictional texts. Emphasis will be placed on the writing of interpretive essays and on the exploration of how various cultural and intellectual perspectives as well as different theoretical stances affect the reading of a specific text. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6312 Major Authors (3 semester hours) Study of one or more major literary figures, such as Dante, Chaucer, Milton, Cervantes, Goethe, Austen, Blake, Balzac, Dostoevsky, Tolstoy, Mann, Eliot, Pound, Woolf, Faulkner, Paz or Borges. (May be repeated for credit as subjects vary to a maximum of 9 credit hours.) (3-0) Y

HUSL 6313 Shakespeare (3 semester hours) Study of the dramatic and/or poetic writings of William Shakespeare. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6314 Jane Austen and Her Time (3 semester hours) Study of the writings of Jane Austen and the ways in which her work engages the political and social issues of her day. (3-0) T**HUSL 6315 Literary Theory** (3 semester hours) Consideration of major literary theories, such as new criticism, deconstruction, gender studies, and chaos theory, with emphasis on how these theories influence and modify the interpretation of literary and other artistic texts. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6330 Studies in Literature and the Other Arts (3 semester hours) An examination of the links between literature and music, the visual arts, film, theater, and/or dance. Topics and approaches will vary but may include, for example, the fantastic in literature and visual arts, structures in literature and music, adaptations of novels into film, and the pastoral in literature and the visual arts. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6340 Literature Before 1800 (3 semester hours) Studies in the literature and culture of selected periods in the Western tradition. May focus on ancient, medieval, or early modern periods. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 6345 Early American Literature (3 semester hours) Study of literary works written in and about America from the early 1500s to 1800. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6350 Literature of the Nineteenth Century (3 semester hours) Studies in the literature and culture of the nineteenth century. May focus on British, European, American, Latin American, or Asian contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 6355 Literature, Science, and Culture (3 semester hours) Seminar emphasizing the treatment in literature of scientific concepts (e.g., relativity, evolution) and technological developments (e.g., computers, virtual reality) of particular importance. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6360 Literature of the Twentieth Century (3 semester hours) Studies in the literature and culture of the twentieth century. May focus on British, European, American, Latin American, or Asian contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 6370 Studies in Literature and Ideas (3 semester hours) Studies of the relationship between selected literary texts and major ideas in philosophy, science, and politics. The course will examine systems of thoughts as they are incorporated, delineated, and explored in literature. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6372 Literature and Society (3 semester hours) Seminar studying the values and concerns of various social groups through a study of literary texts, including consideration of the role of literature and the writer in given societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6373 Topics in Latin American Literature (3 semester hours) Studies in the literatures and cultures of Latin America. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6374 Modern Jewish Literature Across Cultures (3 semester hours) Study of modern Jewish literatures in multiple national contexts and languages, with emphasis on the interaction between modernity and vision of Jewish identities and traditions. (3-0) T

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HUSL 6375 German Literature and Ideas 1870-1960 (3 semester hours) Study of the range and diversity of German-Austrian literature and thought from the end of the nineteenth century through the 1960s**.** (3-0) T

HUSL 6376 Literature of Weimar Germany (3 semester hours) Study of literature written during the Weimar Republic (1918-1933) with attention to formative influences on and cultural-political forces shaping the artistic imagination. (3-0) T

HUSL 6378 Literature and the Holocaust (3 semester hours) Seminar considering both major literary works (novels, short stories, and poems) written under the impact of the Holocaust as well as literary theories responding to these texts. Some emphasis placed on films and other works of visual art. (3-0) T

HUSL 6380 The Art and Craft of Translation (3 semester hours) Workshop designed to provide students with a model not only of literary interpretation but also of an interdisciplinary approach through the act of translating that can be applied to a wide range of texts and issues. Emphasis is on the actual translation of literary texts from another language into English. Issues involved in this process will form the basis of the workshop's theoretical component. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) S

HUSL 6381 Critical Approaches to Translation (3 semester hours) The study of the various approaches to the history, theory, and criticism of literary and humanistic translation. Topics may include the translator's working methods, interviews with translators, multiple translations, the changing nature of interpretive approaches, theoretical models of translation, and criteria for the evaluation of translations. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

HUSL 6383 Teaching First-Year Writing (3 semester hours) Covers both the methods of teaching first-year writing and pedagogical theories of modern composition. Enrollment required for teaching assistants assigned to sections of Rhetoric 1302, but not limited to such students. (May be repeated for credit to a maximum of 6 hours.) (3-0) Y

HUSL 6384 Digital and Visual Rhetorics (3 semester hours) Covers a wide range of topics addressing the study of visual rhetoric as well as rhetoric in digital environments. Course also emphasizes the relationship of digital and visual rhetorics to media ecology/media studies as well as the implications of these rhetorics for composition pedagogy. (3-0) T

HUSL 6385 Rhetorical Theory (3 semester hours) A historical survey of Western rhetorical theory focusing on major figures in rhetoric. (3-0) T

HUSL 6386 Special Topics in Rhetoric (3 semester hours) A seminar in the study of rhetoric. May include one or more topics such as ethos, histories of rhetoric, the rhetoric of technology and science, the Sophists, rhetoric as epistemic, key figures in rhetoric (e.g., Burke, Foucault, Baudrillard, Spivak, etc.). (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 6388 The Nature of Language (3 semester hours) An inquiry into the nature, origins, and evolution of language, the relationship of language to thought and to creativity, language as a social tool, and nonverbal patterns of communication. Survey of linguistic theory and method applicable to the study of the phonological, morphological, lexical, semantic, and syntactic levels of language. (3-0) T

HUSL 6389 Applied Linguistics (3 semester hours) Techniques for comparing two or more languages. The study of traditional and modern theories and practices of language learning and teaching. (3-0) T

HUSL 6390 Theory and Practice in Literary Studies (3 semester hours) Group projects integrating the interpretation of literary texts or themes with experiments in creative writing and performance. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6392 Topics in Literary Studies (3 semester hours) The study of themes, genres, authors, and/or movements in literature. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 6393 Independent Readings in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUSL 6394 Independent Research in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0) R

HUSL 6395 Special Topics in Literary Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the M.A. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUSL 6396 Spanish Language, Literature, and Culture (3 semester hours) Studies in the language, various literary movements, or the general cultures of Spanish-speaking peoples in Europe or Latin America. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

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HUSL 6398 World Literatures (3 semester hours) Studies in literatures from specific regions, ethnic groups, and nationalities within and outside the United States. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 6399 Studies in Asian Literature (3 semester hours) Studies in the literature and cultures of Asia. Topics may include Zen/Chan History, Thought, and Poetry; Confucianism; and the *I-Ching* (Book of Changes). (May be repeated for credit as topics vary to a maximum of 9 credit hours) (3-0) T

HUSL 7308 Advanced Studies in Literary Forms and Genres (3 semester hours) Advanced studies in various literary genres, either individually or in relation to each other. Topics considered may include the difficulties of defining genres, the nature of specific genres, their historical and aesthetic development, and their artistic possibilities. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) T

HUSL 7309 Advanced Studies in Literary Movements (3 semester hours) Advanced studies in the nature of intellectual and artistic movements, with emphasis on how they affect literary expression. Examples of such movements are romanticism, naturalism, modernism, and postmodernism. (May be repeated for credit as topics vary to a maximum of 9 credit hours). (3-0) R

HUSL 7322 Advanced Translation Workshop (3 semester hours) An intensive investigation in a workshop environment of the aesthetics of the art and craft of literary translation focusing on the techniques and processes involved in producing English translations of poetic, dramatic, fictional, and essayistic works. Students are expected to produce publishable translations primarily of works by contemporary international writers. Discussions will include the history and theory of literary translation. Permission of the instructor or previous completion of HUSL 6380 required. (3-0) R

HUSL 7350 Advanced Studies in Nineteenth Century Literature (3 semester hours) Advanced studies in the literature and culture of the nineteenth century. May focus on British, European, American, Asian, or Latin American contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 7360 Advanced Studies in Twentieth Century Literature (3 semester hours) Advanced studies in the literature and culture of the twentieth century. May focus on British, European, American, Asian, or Latin American contexts. (May be repeated for credit as topics vary to a maximum of 9 hours) (3-0) T

HUSL 7370 Advanced Studies in Literature and History (3 semester hours) Studies of selected literary texts and art movements in times of high political tension (American Revolution, Civil War, Weimar Germany, etc.) (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 7372 Advanced Studies in Literature and Society (3 semester hours) Advanced studies of the values and concerns of various social groups through the analysis of literary texts, including consideration of the role of literature and the writer in given societies. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUSL 7390 Advanced Special Topics in Literary Studies (3 semester hours) Independent studies course that may count toward minimum course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUSL 7391 Special Topics in Translation Studies (3 semester hours) The investigation of the field of Translation Studies. Topics may include the anthropological foundation of translation; the study of crossing cultural barriers; translation methodologies as a model for interdisciplinary research; communication as translation; translation and reading; historical aspects of translation; models of cultural differences; critical approaches to the theories of translation from the Greeks to the present; and specific research and translation projects. (May be repeated for credit as topics vary to a maximum of 9 hours.) (3-0) R

HUSL 8303 Independent Readings in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0)R

HUSL 8305 Independent Research in Literary Studies (3 semester hours) (May be repeated for credit.) (3-0)R

Education and General Courses

HUED 5353 (ED 5353) Teaching English as a Second Language (3 semester hours) Investigation of modern techniques of teaching English as a second language in relation to the general development of language skills (listening, speaking, reading, and writing) in secondary schools. Contributions of modern linguistic science to both theory and practice. (3-0) Y

HUED 5360 Teaching Spanish (3 semester hours) Study of modern theories and practices of teaching

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HUSL 7333 Special Topics in Rhetoric (3 semester hours) A seminar in historical and theoretical studies of rhetoric. May include one or more topics such as ethos, histories of rhetoric, the rhetoric of technology and science, the Sophists, rhetoric as epistemic, key figures in rhetoric (e.g., Burke, Foucault, Baudrillard, Spivak, etc.). (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

HUSL 7334 Rhetoric Pedagogy Practicum (3 semester hours) Supervised practicum in teaching rhetoric and composition, with various topics emphasizing rhetorical theory, composition pedagogy, and educational technology presented in a workshop setting. Enrollment required for teaching assistan... [3]

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Spanish, with a focus on pedagogical applications for students teaching foreign-language skills in secondary schools or community colleges. (3-0) T

HUED 6304 Master Of Arts In Teaching Casebook (3 semester hours) (May be repeated for credit.) (3-0) R

HUMA 6320-6323 Review Courses in Foreign Languages (3 semester hours) Intensive grammar review to assist students in moving from intermediate to advanced work with foreign-language texts. Prerequisite: intermediate proficiency (usually equivalent to four semesters of undergraduate courses). The courses do not meet the language requirement or count in degree plans, but they are offered to help students prepare for the textual interpretation and translation undertaken in the language workshops. They are graded on a pass/fail basis. (3-0)Y

HUMA 6320 French Review
HUMA 6321 Spanish Review
HUMA 6323 German Review

HUMA 6330-6333 Advanced Workshops in Foreign Languages (3 semester hours) Advanced reading, interpretation, and translation of texts in the languages listed below. Recommended preparation: at least intermediate proficiency (usually equivalent to four semesters of undergraduate courses); the appropriate review course HUMA 6320-6323 is also recommended. Although students earn regular grades in the workshops, they do not count toward minimum course requirements for any degree, since they are offered to help students prepare for the program's proficiency examinations. Each workshop concludes with a translation examination, which comprises both the course final and the program's proficiency examination in the foreign language. (3-0) R

HUMA 6330 French Workshop
HUMA 6331 Spanish Workshop
HUMA 6333 German Workshop

HUMA 6390 Topics in Arts and Humanities (3 semester hours) Studies of topics that incorporate multiple disciplinary materials and perspectives. (May be repeated for credit as topics vary to a maximum of 9 credit hours.) (3-0) R

HUMA 6393 Independent Readings in Arts and Humanities (3 semester hours) (May be repeated for credit.) (3-0) R

HUMA 6395 Independent Research in Arts and Humanities (3 semester hours) (May be repeated for credit.) (3-0) R

HUMA 6V81 Special Topics in Arts and Humanities (1-9 semester hours) If taken as an independent studies course may count toward minimum course requirements for the M.A. and Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) ([1-9]-0) R **HUMA 7390 Adv. Topics in Arts and Humanities** (3 semester hours) Advanced studies of topics that incorporate multiple disciplinary materials and perspectives. (May be repeated for credit to a maximum of 9 hours.) (3-0) R

HUMA 7V81 Adv. Special Topics in Arts and Humanities (1-9 semester hours) If taken as an independent studies course may count toward minimum course requirements for the Ph.D. degree. (May be repeated for credit to a maximum of 9 hours.) ([1-9]-0) R **HUMA 8303 Independent Readings in Arts and Humanities** (3 semester hours) (May be repeated for credit.) (3-0) R

HUMA 8305 Independent Research in Arts and Humanities (3 semester hours) (May be repeated for credit.) (3-0) R

HUMA 8V99 Ph.D. Dissertation (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R

Latin American Studies Courses

LATS 6300 Introduction to Latin American Studies (3 semester hours) An interdisciplinary introduction to the theories, methodologies, topics, and themes relevant to the study of Latin America. Required of all students in the M.A. program in Latin American Studies. (3-0) Y

LATS 6390 Internship in Latin American Studies (3 semester hours) Students will complete an internship established in partnership with UT Dallas and businesses and/or not-for-profit agencies in the Dallas-Fort Worth area. (May be repeated but only 6 credit hours will be counted toward the M.A.) (3-0) R

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HUMA 7330 Advanced French (May be repeated for credit to a maximum of 6 hours.)
HUMA 7331 Advanced Spanish (May be repeated for credit to a maximum of 6 hours.)
HUMA 7332 Advanced Italian (May be repeated for credit to a maximum of 6 hours.)
HUMA 7333 Advanced German (May be repeated for credit to a maximum of 6 hours.)
HUMA 7334 Advanced Classical Greek (May be repeated for credit to a maximum of 6 hours.)
HUMA 7335 Advanced Latin (May be repeated for credit to a maximum of 6 hours.)

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LATS 6399 Capstone Project in Latin American Studies (3 semester hours) Students produce a capstone project on a topic of their choice in Latin American Studies in the form of either a research thesis or final project. (May be repeated but only 6 credit hours will be counted toward the M.A.) (3-0) R

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HIST 8398 Master's Thesis (3 semester hours) (May be repeated for credit but only 6 hours will be counted toward M.A.) (3-0) R
HUED 8304 Master Of Arts In Teaching Casebook (3 semester hours) (May be repeated for credit.) (3-0) R
HUMA 8V99 Ph.D. Dissertation (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) R

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HUAS 7350 Creating Nonfictions: Advanced (3 semester hours) An intensive investigation into the theory, aesthetics, and creation of biographies, autobiographies, and historical accounts in a workshop environment that will explore the boundaries between fiction and non-fiction and between art and reality. Permission of the instructor and previous completion of HUAS 6396 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7351 Creating Short Stories: Advanced (3 semester hours) An intensive investigation into the theories, aesthetics, and creation of the short story in a workshop environment that will focus both on structure and on creative techniques and creative process involved in producing sophisticated, challenging, and linguistically developed short stories. Permission of the instructor and previous completion of HUAS 6395 are required. Topics may vary. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7352 Creating Poetry: Advanced (3 semester hours) An intensive investigation into the forms (both ancient and modern), theories, and creations of poetry in a workshop environment that will focus on the creative techniques and processes involved in producing formalist, lyrical, free verse, and experimental poetry. Permission of the instructor and previous completion of HUAS 6350 are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7353 Creating Novels: Advanced (3 semester hours) An intensive investigation of the changing structural history, artistic development, and creation of the novel in a workshop environment that will focus on the creative techniques and the creative process involved in producing novels in a variety of realistic, minimal, lyrical, experimental, and traditional forms. Permission of the instructor and completion of a minimum of six hours of creative writing (fiction or nonfiction) at the graduate level are required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUAS 7354 Creating Scripts: Advanced (3 semester hours) An intense investigation of the theory, history, aesthetics, art, and creation of play, movie, and television scripts in a workshop environment that will focus on the creative techniques and processes involved not only in the creation of film, play, and television scripts, but also in the production of plays, films, and television episodes. Permission of the instructor and previous completion of either HUAS6352 or HUAS6353 required. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T

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HUHI 7375 Space, Time, and Culture (3 semester hours) Study of the relationship between changing philosophic and scientific concepts of space and time and forms of cultural expression such as art, literature, and music. (3-0) T
HUHI 7379 Philosophical Issues and the Humanities (3 semester hours) An investigation of the ways the humanities contribute to an understanding of such philosophical problems as hermeneutics, moral education, life and death, race, gender and sexual orientation, and the environment. (May be repeated for credit to a maximum of 9 credit hours.) (3-0) T
HUHI 7386 Artist and Writer in Society (3 semester hours) Inquiries into the role of creative artists (e.g., painters, sculptors, musicians, writers, filmmakers) in various places and times. Topics may vary. (May be repeated for credit to a maximum of 6 credit hours.) (3-0) T

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HUSL 7323 Critical Approaches to Translation (3 semester hours) The study of the various approaches to the history, theory, and criticism of literary and humanistic translation. Topics may include the translator's working methods, interviews with translators, multiple translations, the changing nature of interpretive approaches, theoretical models of translation, and criteria for the evaluation of translations. (May be repeated for credit as topics vary to a maximum of 6 credit hours.) (3-0) T

technology and science, the Sophists, rhetoric as epistemic, key figures in rhetoric (e.g., Burke, Foucault, Baudrillard, Spivak, etc.). (May be repeated for credit to a maximum of 9 credit hours.) (3-0) R

HUSL 7334 Rhetoric Pedagogy Practicum (3 semester hours) Supervised practicum in teaching rhetoric and composition, with various topics emphasizing rhetorical theory, composition pedagogy, and educational technology presented in a workshop setting. Enrollment required for teaching assistants assigned to sections of Rhetoric 1302, but not limited to such students. (May be repeated for credit.) (3-0) S

HUSL 7335 Digital Rhetorics (3 semester hours) Covers a wide range of topics concerned with rhetoric and writing in digital environments. It is designed specifically to address forms of expression (written and visual) and interpretation (reading protocols) with emphasis on critical analysis of various discourses and discourse communities (and disciplines) in which rhetoric is central in the age of information technologies. (3-0) T

Page 15: [4] Deleted **mwilson** **11/7/2009 7:16:00 PM**

HUSL 7384 The Nature of Language (3 semester hours) An inquiry into the nature, origins, and evolution of language, the relationship of language to thought and to creativity, language as a social tool, and nonverbal patterns of communication. Survey of linguistic theory and method applicable to the study of the phonological, morphological, lexical, semantic, and syntactic levels of language. (3-0) Y

HUSL 7385 Applied Linguistics (3 semester hours) Techniques for comparing two or more languages. The study of traditional and modern theories and practices of language learning and teaching. (3-0) Y

Biology Course Descriptions

Core Courses

BIOL 5410 (MSEN 5410) Biochemistry of Proteins and Nucleic Acids (4 semester hours) Chemistry and metabolism of amino acids and nucleotides; biosynthesis of nucleic acids; analysis of the structure and function of proteins and nucleic acids and of their interactions including chromatin structure. Prerequisite: BIOL 3361 (biochemistry) or equivalent. (4-0) Y
BIOL 5420 Molecular Biology (4 semester hours) Genetic analysis of gene structure (mutations and their analysis, complementation, and recombination), gene expression (transcription, RNA processing, translation), and the regulation of gene expression in selected model systems (viral, prokaryotic, organellar, eukaryotic); principles of genetic engineering (cloning and recombinant DNA technology). (4-0) Y
BIOL 5430 Macromolecular Physical Chemistry (4 semester hours) Structures and properties of macromolecules, interactions with electromagnetic radiation, thermodynamics of macromolecular solutions, and transport processes. Prerequisites: MATH 2417 (Calculus and PHYS 1301 (General Physics)). (4-0) Y
BIOL 5440 (MSEN 5440) Cell Biology (4 semester hours) Molecular architecture and function of cells and subcellular organelles; structure and function of membranes; hormone and neurotransmitter action; growth regulation and oncogenes; immune response; eukaryotic gene expression. Prerequisites: BIOL 5410 and BIOL 5420, or the equivalent, or permission of the instructor. (4-0) Y

Advanced Study

Work is offered beyond the core curriculum in four major areas that parallel four of the lecture-type core courses. Each area provides elective courses, advanced colloquia, and dissertation opportunities. Electives will usually be offered only one semester per year and in some cases only once every other year.

Topics in Biochemistry

(Bulla, DeJong, González, Gray, Hannig, Levene, Miller, Reitzer, Spiro, L. Zhang, M. Zhang)

General Electives

BIOL 6211 Posttranscriptional Regulation of Gene Expression (2 semester hours) Emphasis on current research in regulation of gene expression involving posttranscriptional mechanisms. Topics include translational regulation of gene expression, protein and messenger RNA turnover, regulation of protein folding and localization, protein phosphorylation, and the formation of active and inactive protein complexes. (2-0) T
BIOL 6354 Microbial Physiology (3 semester hours) Microbial physiology considers the basic processes of microbes, especially those variations that are unique to microbes: energy generation, fermentations, and other pathways specific to bacteria, cellular structure and differentiation, and bacterial responses to the environment. (3-0) Y
BIOL 6V19 Topics in Biochemistry (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) Y
BIOL 6V28 DNA Replication, Recombination, and Repair (2-3 semester hours) Focuses on central aspects of DNA enzymology and metabolism.The mechanisms of DNA replication, recombination, and repair are fundamental to understanding many principles of molecular biology, genetics, molecular medicine, and evolution. This course is mechanistically oriented and will provide a strong working

knowledge of these processes through an extensive overview, which includes discussions of some of the most recent publications on these topics. ([2-3]-0) T

Special Electives

BIOL 7V10 Research Seminar in Biochemistry (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) ([2-5]-0) Y

Topics in Molecular Biology

(Breen, DeJong, González, Hannig, Levene, Miller, Pace, Reitzer, Spiro, L. Zhang, M. Zhang)

General Electives

BIOL 5381 Genomics (3 semester hours) Genome sequence acquisition and analysis; genomic identification; biomedical genome research; DNA microarrays and their use in applied and healthcare research. (3-0) T

BIOL 5376 Applied Bioinformatics (3 semester hours) Genomic information content; data searches and multiple sequence alignment; mutations and distance-based phylogenetic analysis; genomics and gene recognition; polymorphisms and forensic applications; nucleic-acid and protein array analysis; structure prediction of biological macromolecules. Prerequisites: STAT 1342 (Introductory Statistics) and MATH 1325 and MATH 1326 (2 semesters of calculus)(3-0) T

BIOL 6121-6123 Biotechnology I-III (1 semester hour) Gene cloning, nucleotide sequencing and other aspects of genetic engineering. This course has between one and five components, which will be offered sequentially and which may therefore be taken independently (with consent of instructor). (0-2) Y

BIOL 6227 RNA World (2 semester hours) The nature of modern RNA suggests a prebiotic RNA world. This course will begin with a presentation of the arguments that a “RNA world” existed before the evolution of protein synthesis. Additional topics will include RNA evolution, the origin and evolution of introns, RNA replication, the evolution and involvement of tRNAs and rRNAs in protein synthesis, the structure and mechanism of large catalytic RNAs such as Group I and Group II introns and the RNase P RNA, the structure and mechanism of small nuclear RNAs such as hammerheads and hairpins, RNA editing, and the mechanism of telomerase. (2-0) T

BIOL 6228 Prokaryotic Gene Expression (2 semester hours) Principles of gene regulation in bacteria are discussed. The readings consist of recent developments described in the research literature. Topics will vary, but will include bacterial chromosome structure, function and structure of RNA polymerase and promoters, the mechanism of action of various repressors and activators, the coordination of gene expression in phage lambda, during nitrogen limitation, and during sporulation. (2-0) T

BIOL 6335 Graduate Medical Microbiology (3 semester hours) This course expose students to advanced concepts and principles of medical microbiology. In addition, the course will deal with mechanisms associated with disease processes, microbial virulence, the control of bacterial growth, and host responses to infection. (3-0) T

BIOL 6336 Parasitology (3 semester hours) A look at the molecular level at microorganisms that live at the expense of higher eukaryotes. Emphasis will be given to the latest scientific literature describing these important pathogenic interactions. Therapeutic treatments and preventive methods will also be covered. (3-0) T

BIOL 6337 Regulation of Gene Expression (3 semester hours) An in depth look at how the cell makes use of its genetic information, with a primary focus on the mechanisms of transcription regulation. The course emphasizes a critical discussion of techniques and results from the recent scientific literature. Topics are taken from eukaryotic and/or prokaryotic systems and typically cover areas such as promoter organization, RNA polymerase and transcription factor structure and function, the organization and packaging of chromosomes, whole-genome analyses, and the pathways that control gene expression during growth and development. (3-0) Y

BIOL 6338 Symbiotic Interactions (3 semester hours) An in depth look, at the molecular level, of well

characterized symbiotic interactions between prokaryotes and eukaryotes. This course makes use of recent scientific literature and the latest discoveries in the area of symbiosis. (3-0) R
BIOL 6373 Proteomics (3 semester hours) Protein identification, sequencing, and analysis of post-translational modifications by liquid chromatography/tandem mass spectrometry; determination of protein three dimensional structure by x-ray crystallography; its use in drug design; understanding protein interactions and function using protein chip microarrays. (3-0) T
BIOL 6V29 Topics in Molecular Biology (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) Y
BIOL 6V34 Quorum Sensing (2-3 semester hours) The focus of this course is the analysis of quorum sensing and its role in pathogenic and symbiotic interactions. This course makes use of recent scientific literature and the latest discoveries in the area of population density dependent gene expression. [(2-3)-0] R

Special Electives

BIOL 7V20 Research Seminar in Molecular Biology (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) ([2-5]-0) Y

Topics In Biophysics

(Gray, Levene, Xia)

General Electives

BIOL 6358 (MSEN 6358) Bionanotechnology (3 semester hours) Protein, nucleic acid and lipid structures. Macromolecules as structural and functional units of the intact cell. Parallels between biology and nanotechnology. Applications of nanotechnology to biological systems. (3-0) R
BIOL 6V30 Biopolymers (2-4 semester hours) Structure and properties of biologically important macromolecules. ([2-4]-0) R
BIOL 6V32 Electron Microscopy (2-3 semester hours) Theory and practice of electron microscopy. The laboratory section includes specimen preparation, operation of the electron microscope, and darkroom work. ([1-2]-2) R
BIOL 6V33 Biomolecular Structures (2-3 semester hours) This course includes a discussion of DNA structures, protein structures, the folding and stability of domains, and the binding of proteins to DNA. Methods used to investigate the relation of structure to function are emphasized. Types of protein structures whose structure and function are considered include transcription factors, proteinases, membrane proteins, proteins in signal transduction, proteins of the immune system, and engineered proteins. ([2-3]-0) Y
BIOL 6V39 Topics in Biophysics (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) T

Special Electives

BIOL 7V30 Research Seminar in Biophysics (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) ([2-5]-0) R

Topics In Cell Biology

(Breen, Burr, D'Mello, Draper, Pace, L. Zhang)

General Electives

BIOL 6340 Developmental Neurobiology (3 semester hours) The course will cover the molecular and cellular mechanisms underlying key processes in the development of the vertebrate nervous system such as neural induction, morphogenesis of the neural tube, patterning of the brain, differentiation and migration of neurons, axon guidance, synaptogenesis and the regulation of neuronal survival. The course is designed to be interactive and will include lectures, student presentations, and discussion of important discoveries in the area. (3-0) Y

BIOL 6345 Molecular Basis of Acquired Immune Deficiency Syndrome (3 semester hours) Topics include an analysis of the molecular basis of the infection of target cells by HIV, the intracellular replication of retroviruses, with special attention given to the HIV *tat* and *rev* genes, and an analysis of the roles of the HIV accessory genes: *vif*, *vpr*, *vpu* and *nef*. The immunological response of the host to HIV is considered, as is the biological basis for the ultimate failure of the immune system to contain this virus, with attendant immune collapse. The molecular basis of a variety of existing and potential anti-retroviral therapies is considered. (3-0) Y

BIOL 6351 Cellular and Molecular Biology of the Immune System (3 semester hours) Innate and adaptive immunity. Structure and function of immunoglobulins and MHC molecules, and their role in the adaptive immune response. Function of the primary and secondary lymphoid tissues, and the role of professional antigen presenting cells. The molecular basis for the generation of diversity during cellular development of B and T lymphocytes. The role of complement in innate immunity, and details of T cell and B cell mediated immunity. (3-0) Y

BIOL 6357 Cell Signaling (3 semester hours) This course will provide information on signal transduction pathways controlling growth, development and diseases. Students will be required to present research papers and discuss experimental data. (3-0) R

BIOL 6V41 Oncogenes (2-4 semester hours) Properties of cancer cells, *in vivo* and *in vitro*. Telomeres and cellular immortality. The role of DNA and RNA viruses in human cancers. Molecular biology of chronic leukemia retroviruses and the acutely transforming retroviruses. Retroviral oncogenes; the role of mutation, amplification, and chromosomal translocation of cellular oncogenes in human cancer. Regulation of the eukaryotic cell cycle, and the role of tumor suppressor genes. The role of oncogenes in growth hormone signal transduction. The role of apoptosis, and developmental signaling pathways in cancer. ([2-4]-0) Y

BIOL 6V42 Membrane Biology I (2-4 semester hours) Membrane traffic in the secretory pathway. Topics covered include insertion of proteins into membranes, the mechanism of vesicular traffic from the rough endoplasmic reticulum through the Golgi apparatus to the plasma membrane, protein sorting during secretion and membrane biogenesis. ([2-4]-0) T

BIOL 6V43 Membrane Biology II (2-4 semester hours) Membrane traffic in the endocytic pathway. Topics covered include the structure, function and sorting of membrane receptors, the formation and function of clathrin-coated pits, membrane recycling and the biogenesis of endosomes and lysosomes. ([2-4]-0) R

BIOL 6V44 Animal Cell Culture (2-4 semester hours) Theory and practice of the growth of animal cells in culture. Topics include: the isolation and characterization of mammalian cell mutants, chromosome mapping, the use of somatic cell hybrids to investigate eukaryotic gene regulation, gene transfer into animal cells, gene targeting and production of “gene knockouts.” ([2-4]-0) R

BIOL 6V49 Topics in Cell Biology (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) Y

Special Electives

BIOL 7V40 Research Seminar in Cell Biology (2-5 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading, may be repeated for credit.) ([2-5]-0) Y

General Topics in Molecular and Cell Biology

General Electives

BIOL 5V00 Topics in Biological Sciences (1-6 semester hours) May be repeated for credit to a maximum of 9 hours ([1-6]-0) Y
BIOL 5V01 Topics in Biological Sciences (1-6 semester hours) Includes a laboratory component. May be repeated for credit to a maximum of 9 hours (1-[0-10]) Y
BIOL 5V95 Advanced Topics in Molecular and Cell Biology (Individual instruction) (1-6 semester hours) May be repeated for credit with permission of the graduate advisor ([1-6]-0) Y
BIOL 6V00 Topics in Biological Sciences (1-6 semester hours) May be repeated for credit to a maximum of 9 hours ([1-6]-0) Y
BIOL 6V01 Topics in Biological Sciences (1-6 semester hours) Includes a laboratory component. May be repeated for credit to a maximum of 9 hours (1 [0-10]) Y
BIOL 6V04 Biology Seminar (1-6 semester hours) May be repeated for credit to a maximum of 6 hours ([1-6]-0) Y
BIOL 6V92 Readings in Molecular and Cell Biology (3-9 semester hours) ([3-9]-0) Y
BIOL 6V95 Advanced Topics in Molecular and Cell Biology (Individual instruction) (1-6 semester hours) May be repeated for credit with permission of the graduate advisor ([1-6]-0) Y

Special Electives

BIOL 5V50 Methods in Molecular and Cell Biology I (2-6 semester hours) Laboratory instruction in biological, biophysical, and biochemical techniques. Supplemental lectures and demonstrations. (P/F grading) (1-[4-10]) Y
BIOL 5V51 Methods in Molecular and Cell Biology II (2-6 semester hours) Laboratory instruction in advanced techniques in molecular and cell biology. Supplemental lectures and demonstrations. (P/F grading) (1-[4-10]) Y
BIOL 5V52 Methods in Molecular and Cell Biology III (2-6 semester hours) Laboratory instruction in advanced techniques in molecular and cell biology. Supplemental lectures and demonstrations. (1-[4-10]) T
BIOL 6150 Current Research in Molecular and Cell Biology (1 semester hour) Analysis of recent developments in molecular and cell biology. Students will attend presentations of current research literature. P/F grading only. Maybe repeated for credit (4 hours maximum.) (1-0) Y
BIOL 6193 Colloquium in Molecular and Cell Biology (1 semester hour) Required for all degree students except non-thesis M.S., to be taken before a Supervising Committee is appointed. (P/F grading) (1-0) Y
BIOL 6252 Current Research in Molecular Biology (2 semester hours) Recent developments in biosynthesis, structure, function and expression of nucleic acids in prokaryotes and eukaryotes. Students will participate in a critical analysis of current research publications. (P/F grading, may be repeated for credit to a maximum of 8 hours.) (2-0) S
BIOL 6352 Modern Biochemistry I (3 semester hours) Structure and function of proteins, including enzyme kinetics and catalytic mechanisms; structure and metabolism of carbohydrates, including oxidative phosphorylation and electron transport mechanisms. For students who have not had undergraduate biochemistry. (3-0) S
BIOL 6353 Modern Biochemistry II (3 semester hours) Continuation of BIOL 6352. Structure and metabolism of lipids, including membrane structure and function. Nitrogen metabolism: amino acids and nucleotides. Polynucleotide replication, transcription, and translation. For students who have not had undergraduate biochemistry. (3-0) Y
BIOL 6356 Eukaryotic Molecular and Cell Biology (3 semester hours) Regulation of cellular activities in eukaryotic cells; structural and molecular organization of eukaryotic cells; molecular basis of cell specialization; membranes and transport. For students who have not had undergraduate cell biology. (3-0) S
BIOL 6V02 The Art of Scientific Presentation (1-2 semester hours) Students learn how to give an effective seminar by reading scientific articles on a central theme in biology and then delivering a presentation, first to their classmates, followed by another presentation to the Molecular and Cell Biology faculty and students. While learning the focused theme, students acquire skill sets in critical reading of scientific literature and oral presentation. Required for all Ph.D. students. (P/F grading) ([1-2]-0) Y
BIOL 6V31 Molecular Genetics (3-4 semester hours) A graduate survey of the phenomena and

mechanisms of heredity, its cytological and molecular basis, with a focus on bacterial and model eukaryotic systems. Topics will include fundamentals of Mendelian Genetics, genetic recombination and genetic linkage, as well as, gene structure and replication, gene expression and the transfer of genetic information, mutation and mutagenesis, and applications of recombinant DNA techniques to genetic analysis. For students who have not had undergraduate genetics ([3-4]-0) Y

BIOL 7450 Research Seminar in Molecular and Cell Biology (4 semester hours) Presentation and analysis of ongoing independent research projects, accompanied by evaluation of recent related literature. (P/F grading. May be repeated for credit.) (4-0) S

BIOL 8V01 Research in Molecular and Cell Biology (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) S

BIOL 8V50 Internship in Biotechnology/Biomedicine (3-6 semester hours) Provides faculty supervision for a student's internship. Internships must be in an area relevant to the student's coursework for the MS in Biotechnology. ([1-6] - 0) R

BIOL 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) ([3-9]-0) S

BIOL 8V99 Dissertation (1-9 semester hours) (May be repeated for credit.) ([1-9]-0) S

Course Descriptions

BIOL 5376 Applied Bioinformatics (3 semester hours) Genomic information content; database searches; pairwise and multiple sequence alignment; mutations and distance-based phylogenetic analysis; genomics and gene recognition; genetic polymorphisms and forensic applications; nucleic-acid and protein array analysis; structure prediction of biological macromolecules. Lectures are augmented with laboratory exercises and demonstrations. Introductory statistics and 2 semesters of calculus required. (3-0) Y

CS 6325 Introduction to Bioinformatics (3 semester hours) This course aims to introduce graduate students to the new field of bioinformatics. This area has arisen from the needs of biologists to utilize and help interpret the vast amounts of data that are constantly being gathered in biomedical research. This course provides an overview of the basic concepts in molecular cell biology and molecular genetics, outlines the nature of the existing data, and describes the kind of computer algorithms and techniques that are necessary to understand biomedical data. Prerequite: CS5343 Data Structure or permission of instructor (3-0) Y

BIOL 5381 Genomics (3 semester hours) The fundamentals of how the human genome sequence was acquired and the impact of the human genome era on biomedical research, medical care and genetic testing will be explored. New tools such as DNA microarray, realtime PCR, mass spectrometry and data mining using bioinformatics will be covered. (3-0) Y

BIOL 6373 Proteomics (3 semester hours) Protein identification, sequencing, analysis of post-translational modifications, understanding protein interactions, and changes in content by mass spectrometry; and determination of function using protein chip microarrays. (3-0) Y

BIOL 6384 Biotechnology Laboratory (3 semester hours) Laboratory instruction in LC/MS/MS mass spectral analysis of protein sequence, ICAT (isotope coded affinity tag) reagents, and MS analysis of cellular proteomes, PCR and DNA Sequencing, and DNA microarray analysis; fluorescence and confocal microscopy and fluorescence activated cell sorting. Instructor may require students to demonstrate adequate laboratory skills in order to enroll. (1-2) Y

Electives

A sampling of electives available to students in the Biotechnology M.S. program follows:

BIOL 6V29 Topics in Molecular Biology (2-5 semester hours) May be repeated for credit to a maximum of 9 hours. ([2-5]-0) Y

BIOL 8V50 Internship in Biotechnology/Biomedicine (3-6 semester hours). Provides faculty supervision for a students internship. Internships must be in an area relevant to the students coursework for the MS in Biotechnology. ([1-6] - 0) R

CS 5343 Algorithm Analysis & Data Structures (3 semester hours) Formal specifications and representation of lists, arrays, trees, graphs, multilinked structures, strings and recursive pattern structures. Analysis of associated algorithms. Sorting and searching, file structures. Relational data models. Prerequisites: CS 5303, CS 5333. (3-0) S

CS 6360 Database Design (3 semester hours) Methods, principles, and concepts that are relevant to the practice of database software design. Database system architecture; conceptual database models; relational and object-oriented databases; database system implementation; query processing and optimization; transaction processing concepts, concurrency, and recovery; security. Prerequisite: CS 5343. (3-0) S

CS 6363 Design and Analysis of Computer Algorithms (3 semester hours) The study of efficient algorithms for various computational problems. Algorithm design techniques. Sorting, manipulation of data structures, graphs, matrix multiplication, and pattern matching. Complexity of algorithms, lower bounds, NP completeness. Prerequisite: CS 5343 (3-0) S

CS 6372 Biological Database Systems and Datamining (3 semester hours) This course emphasizes the concepts of database, data warehouse, data mining and their applications in biological science.

Topics include relational data models, data warehouse, OLAP, data pre-processing, association rule mining from data, classification and prediction, clustering, graph mining, time-series data mining, and network analysis. Applications in biological science will be focused on Biological data warehouse design, association rule mining from biological data, classification and prediction from microarray data, clustering analysis of genomic and proteomic data, mining time-series gene expression data, biological network (including protein-protein interaction network, metabolic network) mining. Prerequisite: CS 6325 Introduction to Bioinformatics or BIOL 5376 Applied Bioinformatics (3-0) Y.

ENTP 6370 Entrepreneurship (3 semester hours)This course is designed to provide an introduction to entrepreneurship for management and non-management students. There are no prerequisites for the course. The course emphasizes the development of new ventures including technology-based ventures, addressing opportunity identification and evaluation, market assessment, startup strategies, business plan development, venture financing, and startup management. Case studies and guest lectures by practicing entrepreneurs and investors provide a real-world perspective. The major deliverable of this course is business plan (including an early stage feasibility analysis) of a venture of the student's choosing. This course is available to all graduate students enrolled at UTD (3-0 credit hours). S

FIN 6301 Financial Management (3 semester hours) Theoretical and procedural considerations in the administration of the finance function in the individual business firm; planning, fundraising, controlling of firm finances; working capital management, capital budgeting and cost of capital. Co-requisites: STAT 5311 or OPRE 6301 and AIM 6201, or consent of instructor. (3-0) S

MATH 6345 Mathematical Methods in Medicine and Biology (3 semester hours) Introduction to the use of mathematical techniques in solving biologically important problems. Some examples of topics that might be covered are biochemical reactions, ion channels, cellular signaling mechanisms, kidney function, nerve impulse propagation. Prerequisities: MATH 1471, MATH 1472, (MATH 2420 recommended) Y

STAT 5351 Probability and Statistics I (3 semester hours) A mathematical treatment of probability theory. Random variables, distributions, conditioning, expectations, special distributions and the central limit theorem. The theory is illustrated by numerous examples. This is a basic course in probability and uses calculus extensively. Prerequisite: Multivariable calculus (MATH 2451). (3-0) T

STAT 5352 Probability and Statistics II (3 semester hours) Theory and methods of statistical inference. Sampling, estimation, confidence intervals, hypothesis testing, analysis of variance, and regression with applications. Prerequisite: STAT 5351. (3-0) T

SCI 5V06/POEC 7329/HMGT 6326 Special Topics - Biomedical Ventures in the DFW Region. This course explores the industrial and commercial opportunities at the intersection of biomedical/bioengineering research and clinical activity and North Texas' industrial strengths in information and communication technologies (ICT). The course is organized around guest presenters representing key sectors, technologies and organizations in the emerging DFW bio-economy. Students will study how to assess the potential payoffs, measured in terms of expanded economic activity and improved patient outcomes, of adding ICT-enhanced "precision" biomedical/health services delivery to its existing industrial strengths. Students may enroll either for graduate course credit or certificate credit. (3-0) Y

Course Descriptions

CHEM 5314 Advanced Physical Chemistry (3 semester hours) Modern concepts from the three pillars of physical chemistry: quantum mechanics, thermodynamics/statistical mechanics, and kinetics. Prerequisite: CHEM 3322 or equivalent. (3-0) Y

CHEM 5331 (MSEN 5331) Advanced Organic Chemistry I (3 semester hours) Modern concepts of bonding and structure in covalent compounds. Static and dynamic stereochemistry and methods for study. Relationships between structure and reactivity. Prerequisite: CHEM 2325 or equivalent. (3-0) Y

CHEM 5333 (MSEN 5333) Advanced Organic Chemistry II (3 semester hours) Application of the principles introduced in CHEM 5331, emphasizing their use in correlating the large body of synthetic/preparative organic chemistry. Prerequisite: CHEM 5331. (3-0) R

CHEM 5341 (MSEN 5341) Advanced Inorganic Chemistry I (3 semester hours) Physical inorganic chemistry addressing topics in structure and bonding, symmetry, acids and bases, coordination chemistry and spectroscopy. Prerequisite: CHEM 3341, or consent of instructor. (3-0) Y

CHEM 5343 Advanced Inorganic Chemistry II (3 semester hours) Builds on CHEM 5341 to explore the synthesis and reactivity of inorganic/organometallic molecules. Practical applications will be demonstrated by discussing industrial processes catalyzed by metal complexes. Prerequisite: CHEM 5341. (3-0) R

CHEM 5355 (MSEN 5355) Analytical Techniques I (3 semester hours) Study of fundamental analytical techniques, including optical spectroscopic techniques, mass spectrometry, and microscopic and surface analysis methods. (3-0) Y

CHEM 5356 (MSEN 5356) Analytical Techniques II (3 semester hours) Study of chromatography (GC, LC, CZE), statistical methods (standard tests and ANOVA), chemical problem solving, and modern bio/analytical techniques such as biochips, microfluidics, and MALDI-MS. Prerequisite: CHEM 5355 or MSEN 5355 or consent of instructor. (3-0) R

CHEM 5357 Process Analytical Chemistry (3 semester hours) An introduction to process analytical chemistry as practiced in the chemical process and other industries. Includes process control, instrumental techniques, sample and conditioning systems, project integration, and chemometrics. Prerequisite: CHEM 5355 or consent of instructor. (3-0) R

CHEM 5V84 Special Topics in Chemistry/M.A.T. (1-9 semester hours) Various special topics in chemistry of interest to teachers will be discussed. (May be repeated for credit.) (May not be counted as credit toward the M.S. or Ph.D. degrees.) ([1-9]-0) R

CHEM 5V87 Independent Study in Chemistry (1-9 semester hours) In conjunction with a member of the Chemistry faculty, the student will develop a paper or project which emphasizes the ways in which chemical knowledge is confirmed and extended or which leads to improved instruction in chemistry. (May not be counted as credit toward the M.S. or Ph.D. degrees.) May be repeated for credit (9 hours maximum). ([1-9]-0) R

CHEM 6317 Industrial Chemistry (3 semester hours) Survey of chemical industry including commodities, chemical processes, scale-up and process development, environmental concerns, patents. Study of chemical engineering principles. (3-0) R

CHEM 6V19 Special Topics in Physical Chemistry (1-9 semester hours) Subject matter will vary and the course may be repeated for credit. Examples of topics include spectroscopy, quantum mechanics, computational chemistry, and surface chemistry. Prerequisite: CHEM 5314 or consent of instructor. ([1-9]-0) R

CHEM 6V39 Special Topics in Organic Chemistry (1-9 semester hours) Subject matter will vary and the course may be repeated for credit. Examples of topics include organic photochemistry, organometallic chemistry, homogeneous and heterogeneous catalysis, solid state, polymer chemistry, and advanced NMR techniques. Prerequisite: CHEM 5331 or consent of instructor. ([1-9]-0) R

CHEM 6V49 Special Topics in Inorganic Chemistry (1-9 semester hours) Subject matter will vary and the course may be repeated for credit. Examples of topics include physical methods of inorganic chemistry, and bioinorganic chemistry. Prerequisite: CHEM 5341 or consent of instructor. ([1-9]-0) R

CHEM 6V59 Special Topics in Analytical Chemistry (1-9 semester hours) Subject matter will vary. Examples of topics include NMR, X-ray crystallography. May be repeated to a maximum of 9 hours. Prerequisite: CHEM 5355 or consent of instructor. ([1-9]-0) R

CHEM 6V69 Special Topics in Biochemistry (1-9 semester hours) Subject matter will vary. May be

repeated for credit (9 hours maximum). Prerequisite: Consent of instructor. ([1-9]-0) R
CHEM 6V79 Special Topics in Materials Chemistry (1-9 semester hours) Subject matter will vary. Examples of topics include polymers, membrane technology, zeolites, nanoscience and technology. May be repeated to a maximum of 9 hours. Prerequisite: Consent of instructor. ([1-9]-0) R
CHEM 6361 Physical Biochemistry (3 semester hours) Protein structure, fundamental metabolism, structures and properties of macromolecules, interactions with electromagnetic radiation, thermodynamics of macromolecular solutions, transport processes, and other topics. Prerequisite: Consent of instructor (3-0). R
CHEM 6372 Materials Science (3 semester hours) Relationship between the properties and behavior of materials and their internal structure. Treatment of the mechanical, thermal and electrical properties of crystalline and amorphous solids including metals, ceramics, synthetic polymers and composites. Prerequisite: Consent of instructor. (3-0) R
CHEM 6383 Computational Chemistry (3 semester hours) The application of computer techniques to the understanding of molecular structure and dynamics: force field, semi-empirical, ab initio, and molecular dynamics techniques. Information retrieval from large structural databases and use of this information. Prerequisite: Consent of instructor. (3-0) R
CHEM 6389 Scientific Literature and Communication Skills (3 semester hours) Acquaints students with techniques for searching the scientific literature using hard copy and electronic approaches. Introduces students to important steps in creating and improving technical communications in both written and oral formats. (3-0) Y
CHEM 6V84 Special Topics in Applied Chemistry (1-9 semester hours) Subject matter will vary and may be repeated for credit to a maximum of 9 hours. Prerequisite: Consent of instructor. ([1-9]-0) R
CHEM 8981 Research Practicum (9 semester hours) Offers training of students in the direct solution of chemical problems through use of the literature; analysis; and the design, construction and performance of experiments. Method of instruction will be primarily individual direction, questioning, and feedback by the responsible faculty member and/or industrial scientist. Intended for Ph.D. students. May be repeated for credit. (9-0) S
CHEM 8V91 Research in Chemistry (2-9 semester hours) May be repeated for credit. ([2-9]-0) S
CHEM 8398 Thesis (3 semester hours) May be repeated for credit. (3-0) S
CHEM 8399 Dissertation (3 semester hours) May be repeated for credit (3-0) S

CHEM 8V99 Dissertation (1-9 semester hours) May be repeated for credit. ([1-9]-0) S

Course Descriptions

Mathematics and Applied Mathematics Courses

MATH 5301 Elementary Analysis I (3 semester hours) Real numbers, differentiation, integration, metric spaces, basic point set topology, power series, analytic functions, Cauchy's theorem. Prerequisite: Multivariable calculus (MATH 2421) and theoretical concept of calculus (MATH 3310) or equivalent. (3-0) Y
MATH 5302 Elementary Analysis II (3 semester hours) Continuation of MATH 5301. Prerequisite: MATH 5301. (3-0) Y
MATH 5304 Applied Mathematical Analysis for Non-Majors (3 semester hours) Techniques of mathematical analysis applicable to the social, behavioral and management sciences. Differential and integral calculus of one and many variables. No credit allowed to mathematical sciences majors. Prerequisite: College Algebra (3-1) S
MATH 5305 Higher Geometry for Teachers (3 semester hours) Topics in modern Euclidean geometry including distinguished points of a triangle, circles including the nine-point circle, cross ratio, transformations; introduction to projective geometry. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: Junior level mathematics course. (3-0) T
MATH 5306 Non-Euclidean Geometry for Teachers (3 semester hours) The relations among elliptic, Euclidean and hyperbolic geometries, Euclidean models of elliptic and hyperbolic geometries. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: Junior-level mathematics course. (3-0) T
MATH 5313 Modern Algebra for Teachers (3 semester hours) Study of modern algebra involving groups, rings, fields and Galois theory. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: Junior-level mathematics course. (3-0) R
MATH 5390 Topics in Mathematics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) R
MATH 6301 Real Analysis (3 semester hours) Measure theory and integration. Hilbert and Banach spaces. Prerequisites: Undergraduate analysis course (e.g., MATH 4301-2 or MATH 5301-2) undergraduate course in linear algebra (MATH 2418) or equivalent. (3-0) Y
MATH 6302 Real and Functional Analysis (3 semester hours) Continuation of MATH 6301, Hilbert and Banach space techniques. Prerequisite: MATH 6301. (3-0) Y
MATH 6303 Theory of Complex Functions I (3 semester hours) Complex integration, Cauchy's theorem, calculus of residues, power series, entire functions, Riemann mapping theorems. Riemann surfaces, conformal mapping with applications. Prerequisite: Undergraduate analysis (e.g., MATH 4301-2). (3-0) Y
MATH 6304 Theory of Complex Functions II (3 semester hours) Continuation of MATH 6303. Prerequisite: MATH 6303. (3-0) T
MATH 6305 Mathematics of Signal Processing (3 semester hours) The course is devoted to a mathematical foundation of some of the key topics in signal processing: discrete and continuous signal transforms, analysis and design of filters [e.g. lattice filters], least square methods and algorithms. Prerequisites: Undergraduate analysis (MATH 4301-2 or MATH 5301-2); undergraduate course in linear algebra (MATH 2418); undergraduate course in complex variables (MATH 3379) or equivalent. (3-0) T
MATH 6306 Topology and Geometry (3 semester hours) Topics in topology, differential geometry and their applications to areas such as biological sciences and engineering. Prerequisite: Undergraduate analysis (MATH 4301-2 or MATH 5301-2). (3-0) T
MATH 6307 Wavelets and Their Applications (3 semester hours) An introduction to windowed Fourier and continuous wavelet transforms, generalized frames, discrete wavelet frames, multiresolution analysis, Daubechies' orthogonal wavelet bases, and their applications in partial differential equations and signal processing. Prerequisite: Undergraduate linear algebra (MATH 2418) and differential equations (MATH 2420) or equivalent (3-0). T
MATH 6308 Inverse Problems and Applications (3 semester hours) Exact and approximate methods of nondestructive inference, such as tomography and inverse scattering theory in one and several

dimensions, with applications in physical and biomedical sciences and engineering. Prerequisite: Undergraduate linear algebra (MATH 2418) and differential equations (MATH 2420) or equivalent. (3-0) T
MATH 6311 Abstract Algebra I (3 semester hours) Basic properties of groups, rings, fields, and modules. Topics selected from group representations, Galois theory, local rings, algebraic number theory, classical ideal theory, basic homological algebra, and elementary algebraic geometry. Prerequisite: Undergraduate algebra course (MATH 3311) or equivalent. (3-0) T
MATH 6313 Numerical Analysis (3 semester hours) A study of numerical methods including the numerical solution of non-linear equations, linear systems of equations, interpolation, iterative methods and approximation by polynomials. Prerequisites: Knowledge of a high level programming language, Linear algebra (MATH 2418) and multivariable calculus (MATH 2451). (3-0) T
MATH 6315 Ordinary Differential Equations (3 semester hours) The study of ordinary differential equations with emphasis on existence, uniqueness, linear systems, boundary value problems, and stability. Prerequisites: Undergraduate course in linear algebra (MATH 2418) or equivalent; undergraduate analysis (MATH 4301-2 or Math 5301-2); undergraduate course in ordinary differential equations (MATH 2420). (3-0) Y
MATH 6316 Differential Equations (3 semester hours) Continuation of MATH 6315 and an introduction to partial differential equations. Prerequisite: MATH 6315. (3-0) T
MATH 6318 Numerical Analysis of Differential Equations (3 semester hours) Practical and theoretical aspects of numerical methods for both ordinary and partial differential equations are discussed. Topics selected from: initial value problems for ordinary differential equations, two-point boundary value problems, projection methods, finite difference, finite element and boundary element approximations for partial differential equations. Prerequisites: MATH 6313 or equivalent. (3-0) T
MATH 6319 Principles and Techniques in Applied Mathematics I (3 semester hours) Mathematical methods usually used in applied sciences and engineering. Topics chosen from basic linear space theory; Hilbert spaces; fixed point theorems and applications to differential and integral equations; spectral theorem; distributions; Sobolev spaces; the Fourier transforms; complex function theory, calculus of residues; exact, approximate and asymptotic solutions to Laplace, heat and wave equations, Eikonal and WKB methods, and special functions. Prerequisite: Undergraduate linear algebra (MATH 2418), and differential equations (MATH 2420) or equivalent. (3-0) T
MATH 6320 Principles and Techniques in Applied Mathematics II (3 semester hours) Continuation of Math 6319. Prerequisite: MATH 6319. (3-0) T
MATH 6321 Optimization (3 semester hours) Introduction to theoretical and practical concepts of optimization in finite and infinite dimensional setting, least-squares estimation, optimization of functionals, local and global theory of constrained optimization, iterative methods. Prerequisites: Undergraduate ordinary differential equations (MATH 2420) and linear algebra (MATH 2418). (3-0) T
MATH 6331 Linear Systems and Signals (3 semester hours) Basic principles of systems and control theory: state space representations, stability, observableness, controllability, realization theory, transfer functions, feedback. Prerequisites: Undergraduate course in linear algebra (MATH 2418) and undergraduate analysis course or MATH 5301-2. (3-0) T
MATH 6332 Advanced Control (3 semester hours) Theoretical and practical aspects of modern control methodologies in state space and frequency domain, in particular LQG and H-infinity control: coprime factorizations, internal stability, Kalman filter, optimal regulator, robust control, sensitivity minimization, loop shaping, model reduction. Prerequisite: MATH 6331. (3-0) T
MATH 6336 Nonlinear Control Systems (3 semester hours) Differential geometric tools, input-output maps, feedback linearization, nonlinear observers, input-output linearization, output tracking, and regulation. Prerequisites: MATH 6315 and MATH 6331. (3-0) T
MATH 6339 Control of Distributed Parameter Systems (3 semester hours) Theoretical and technical issues for control of distributed parameter systems in the context of linear infinite dimensional dynamical systems: Evolution equations and control on Euclidean space, elements of functional analysis, semigroups of linear operators, abstract evolution equations, control of linear infinite dimensional dynamical systems, approximation techniques. Prerequisites: Undergraduate course in partial differential equations (MATH 4362) and analysis (MATH 4301). (3-0) T
MATH 6341 Bioinformatics (3 semester hours) Fundamental mathematical and algorithmic theory behind current bioinformatics techniques are covered and implemented. They include hidden Markov models, dynamic programming, genetic algorithms, simulated annealing, neural networks, cluster analysis, and information theory. Prerequisites: Knowledge of Unix and a high level programming

language. (3-0) T
MATH 6343 Computational Biology (3 semester hours) Mathematical and computational methods and techniques to analyze and understand problems in molecular biology are covered. Topics include sequence homology and alignment, genetic mapping, protein folding, and DNA computing. Prerequisite: MATH 2418 or equivalent. (3-0) T
MATH 6345 Mathematical Methods in Medicine and Biology (3 semester hours) Introduction to the use of mathematical techniques in solving biologically important problems. Some examples of topics that might be covered are biochemical reactions, ion channels, cellular signaling mechanisms, kidney function, nerve impulse propagation. Prerequisites: MATH 2417, MATH 2419,MATH 2420 recommended. (3-0) T
MATH 6364 Stochastic Calculus in Finance (3 semester hours) Brownian Motion, Ito Calculus, Feynman-Kac formula and an outline of Stochastic Control, Black Scholes Analysis, Transaction Costs, Optimal Portfolio Investment. Prerequisites: STAT 4351 or equivalent, and MATH 2451 or equivalent. (3-0) T
MATH 6390 Topics in Mathematics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) R
MATH 6V81 Special Topics in Mathematics (1-9 semester hours) Topics vary from semester to semester. May be repeated for credit as topics vary. ([1-9]-0) S
MATH 7313 Partial Differential and Integral Equations I (3 semester hours) Topics include theory of partial differential and integral equations. Classical and modern solution techniques to linear and nonlinear partial differential equations and boundary value problems. Introduction to the theory of Sobolev spaces. Prerequisite: MATH 6316 recommended. (3-0) T
MATH 7314 Partial Differential and Integral Equations II (3 semester hours) Continuation of MATH 7313. General theory of partial differential and integral equations, with emphasis on existence, uniqueness and qualitative properties of solutions. Prerequisite: MATH 7313. (3-0) T
MATH 7316 Wave Propagation with Applications (3 semester hours) Study of the wave equation in one, two and three dimensions, the Helmholtz equation, associated Green's functions, asymptotic techniques for solving the propagation problems with applications in physical and biomedical sciences and engineering. Prerequisites: MATH 6303, MATH 6318. (3-0) T
MATH 7319 Functional Analysis (3 semester hours) Elements of operator theory, spectral theory, topics in Banach and operator algebras. Prerequisites: MATH 6301-2. MATH 6303 recommended. (3-0) T
MATH 7390 Topics in Mathematics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) R
MATH 8V02 Individual Instruction in Mathematics (1-6 semester hours) Topics may vary. May be repeated for credit. ([1-6]-0) S
MATH 8V04 Topics in Mathematics (1-6 semester hours) May be repeated for credit. ([1-6]-0) R
MATH 8V07 Research (1-9 semester hours) Open to students with advanced standing subject to approval of the Graduate Adviser. May be repeated for credit. ([1-9]-0) S
MATH 8V98 Thesis (3-9 semester hours) May be repeated for credit. ([3-9]-0) S
MATH 8V99 Dissertation (1-9 semester hours) May be repeated for credit. ([1-9]-0) S

Statistics Courses

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STAT 5191 Statistical Computing Packages (1 semester hour) Introduction to use of major statistical packages such as SAS, BMD, and Minitab. Based primarily on self-study materials. No credit allowed to mathematical sciences majors. Prerequisite: One semester of statistics. (1-0) S
STAT 5351 Probability and Statistics I (3 semester hours) A mathematical treatment of probability theory. Random variables, distributions, conditioning, expectations, special distributions and the central limit theorem. The theory is illustrated by numerous examples. This is a basic course in probability and uses calculus extensively. Prerequisite: Multivariable calculus (MATH 2451). (3-0) T
STAT 5352 Probability and Statistics II (3 semester hours) Theory and methods of statistical inference. Sampling, estimation, confidence intervals, hypothesis testing, analysis of variance, and regression with

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applications. Prerequisite: STAT 5351. (3-0) T

STAT 5390 Topics in Statistics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum).(3-0) R

STAT 6326 Sampling Theory (3 semester hours) Introduction to survey sampling theory and methods. Topics include simple random, stratified, systematic, cluster, unequal probability, multistage, spatial sampling designs. Estimation of means, proportions, variances, ratios, and other parameters for a finite population, optimal allocation, detectability, multiplicity. Prerequisite: STAT 5351. (3-0) T

STAT 6329 Applied Probability and Stochastic Processes (3 semester hours) Basic random processes used in stochastic modeling, including Poisson, Gaussian, and Markov processes with an introduction to renewal processes and queuing theory. Measure theory not required. Prerequisite: STAT 5351. (3-0) T

STAT 6331 Statistical Inference I (3 semester hours) Introduction to fundamental concepts and methods of statistical modeling and decision making. Basic distribution theory. Decision theory. Exponential families of models. Sufficiency. Estimation and hypothesis testing. Likelihood methods and optimality, Large sample approximations. Prerequisites: STAT 5352 or equivalent and MATH 5302 or equivalent. (3-0) Y

STAT 6332 Statistical Inference II (3 semester hours) Elementary and advanced asymptotic methods, treating sample quantiles, U-statistics, differentiable statistical functions and influence curves, the MLE, L-statistics, M-statistics, and the bootstrap. Advanced aspects of statistical inference, likelihood-based inference, robust statistics. General forms of Neyman-Pearson lemma. Metrics on spaces of probability distributions. Prerequisites: STAT 6331 and, either before or concurrently, STAT 6344. (3-0) T

STAT 6337 Advanced Statistical Methods I (3 semester hours) Statistical methods most often used in the analysis of data. Study of statistical models, including multiple regression, nonlinear regression, stepwise regression, regression diagnostics, balanced and unbalanced analysis of variance, analysis of covariance, and log-linear analysis of multiway contingency tables. Prerequisites: MATH 2418 and STAT 5352 or STAT 6331. (3-0) T

STAT 6338 Advanced Statistical Methods II (3 semester hours) This course continues STAT 6337. Topics include oneway and multiway analysis of variance, fixed, random, and mixed effects models, nested designs, repeated measures designs, fractional designs, Latin squares, diagnostics, and implementation of statistical methods in SAS. Prerequisite: STAT 6337. (3-0) T

STAT 6339 Linear Statistical Models (3 semester hours) Vectors of random variables, multivariate normal distribution, quadratic forms. Theoretical treatment of general linear models, including the Gauss-Markov theorem, estimation, hypotheses testing, and polynomial regression. Introduction to the analysis of variance and analysis of covariance. Prerequisites: STAT 6331 and MATH 2418 or equivalent. (3-0) T

STAT 6341 Numerical Linear Algebra and Statistical Computing (3 semester hours) A study of computational methods used in statistics. Topics to be covered include the simulation of stochastic processes, numerical linear algebra, QR decomposition and least squares regression, SV decomposition and multivariate data, statistical programming languages, and graphical methods. Prerequisite: STAT 5352 or STAT 6337. (3-0) T

STAT 6343 Experimental Design (3 semester hours) This course focuses on the planning, development, implementation and analysis of data collected under controlled experimental conditions. Repeated measures designs, Graeco-Latin square designs, randomized block designs, balanced incomplete block designs, partially balanced incomplete block designs, fractional replication and confounding. The course requires substantial use of computer facilities. Prerequisite: STAT 6338 or equivalent knowledge of fixed and random effects crossed ANOVA designs. (3-0) T

STAT 6344 Probability Theory I (3 semester hours) A measure theoretic coverage of probability theory. Measure, integration, Fubini's theorem, random variables, distribution functions, characteristic functions, independence, laws of large numbers, central limit theorem, three-series theorem, Glivenko-

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Cantelli theorem, conditional probability and expectation, introduction to martingales. Prerequisite: MATH 6301. (3-0) T

STAT 6347 Applied Time Series Analysis (3 semester hours) Methods and theory for the analysis of data collected over time. The course covers techniques commonly used in both the frequency domain (harmonic analysis) and the time domain (autoregressive, moving average models). Prerequisite: STAT 6337 or equivalent. (3-0) T

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STAT 6348 Applied Multivariate Analysis (3 semester hours) The most frequently used techniques of multivariate analysis. Topics include T/T2, MANOVA, principal components, discriminant analysis and factor analysis. Prerequisite: STAT 5352 or STAT 6331. (3-0) T

STAT 6365 Statistical Quality and Process Control (3 semester hours) Statistical methodology of monitoring, testing, and improving the quality of goods and services is developed at the intermediate level. Topics include control charts for variables and attributes, assessment of process stability and capability, construction and interpretation of CUSUM, moving average charts and V-masks, optimal sampling techniques, and evaluation of operating-characteristic curves and average time to detection. Prerequisite: STAT 5351or equivalent. (3-0) T

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STAT 6390 Topics in Statistics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). Topics selected from but not limited to choices such as spatial statistics, nonparametric curve estimation, functional data analysis, statistical learning and data mining, actuarial science, sampling theory, statistical quality and process control, sequential analysis, survival analysis, longitudinal data analysis, categorical data analysis, and clinical trials, for example. (3-0) R

STAT 6V99 Statistical Consulting (1-3 semester hours) Practical experience in collaboration with individuals who are working on problems which are amenable to statistical analysis. Problem formulation, statistical abstraction of the problem, and analysis of the data. Course may be repeated but a maximum of three hours may be counted toward the requirements for the master's degree. Prerequisite: Consent of instructor. ([1-3]-0) T

STAT 7330 Decision Theory and Bayesian Inference (3 semester hours) Statistical decision theory and Bayesian inference are developed at an intermediate mathematical level. Prerequisites: MATH 5302 or equivalent, and STAT 6331. (3-0) T

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STAT 7331 Multivariate Analysis (3 semester hours) Vector space foundations and geometric considerations. The multivariate normal distribution: properties, estimation, and hypothesis testing. Multivariate t-test. Classification problems. The Wishart distribution. General linear hypothesis and MANOVA. Principal components, canonical correlations, factor analysis. Multivariate nonparametric and robust methods. Prerequisite: STAT 6331 or equivalent. (3-0) T

STAT 7334 Nonparametric and Robust Statistical Methods (3 semester hours) Topics chosen from Order statistics, ranks, L-statistics, M-statistics, R-statistics. One- and multi-sample location and scale problems. Nonparametric ANOVA. Pitman asymptotic relative efficiency. Minimax asymptotic variance and minimum bias criteria for robust estimation. Robust confidence limits. Optimal influence curves. Nonparametric/robust density and regression curve estimation. Nonparametric and robust methods for multivariate data. Prerequisite: STAT 6331 or equivalent. (3-0) T

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STAT 7338 Time Series Modeling and Filtering (3 semester hours) Theory of correlated observations observed sequentially in time. Stationary processes, power spectra, stationary model fitting, correlation analysis and regression. Prerequisite: STAT 6331 or equivalent. (3-0) T

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STAT 7345 Advanced Probability and Stochastic Processes (3 semester hours) Taught as a continuation of STAT 6344. Martingales, Kolmogorov's existence theorem, random walk, Markov chains, the Poisson process, the general birth and death process, other Markov processes, renewal processes, Brownian motion and diffusion, stationary processes, and the empirical process. Prerequisite: STAT 6344. (3-0) T

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STAT 7390 Topics in Statistics (3 semester hours) May be repeated for credit as topics vary (9 hours maximum). Topics selected from but not limited to choices such as spatial statistics, nonparametric curve

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estimation, functional data analysis, statistical learning and data mining, actuarial science, sampling theory, statistical quality and process control, sequential analysis, survival analysis, longitudinal data analysis, categorical data analysis, and clinical trials, for example. (3-0) R

STAT 8V02 Individual Instruction in Statistics (1-6 semester hours) May be repeated for credit. ([1-6]-0) S

STAT 8V03 Advanced Topics in Statistics (1-6 semester hours) May be repeated for credit. ([1-6]-0) R

STAT 8V07 Research in Statistics (1-9 semester hours) Open to students with advanced standing, subject to approval of the graduate adviser. May be repeated for credit. ([1-9]-0) S

STAT 8V98 Thesis (3-9 semester hours) May be repeated for credit. ([3-9]-0) S

STAT 8V99 Dissertation (1-9 semester hours) May be repeated for credit. ([1-9]-0) S

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Item #12X

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: **10/17/09**
TO: **Graduate Dean**
FROM: **Euel Elliott**

Please indicate with an X if your department catalog copy has no changes: _____

SCHOOL: **Economic, Political and Policy Sciences**

DEPARTMENT: **CRIMINOLOGY**

BASIS FOR CATALOG CHANGES:

Most changes reflect course renumbering at the direction of the University.. 3 courses are being added for curricula reasons.

NEW PROGRAMS/DEGREES/CERTIFICATES:

Course numbering and changes in credit hour changes should be reflected in the two categories below.

NEW COURSES ADDED:

- CRIM 7342 Qualitative Criminology **(Renumbered from CRIM 6340)**
- CRIM 7351 Advanced Criminology Theory Seminar **(Add only: new to program)**
- CRIM 7381 Special Topics in Criminology **(Add only: new to program)**
- CRIM 8V92 Independent Advanced Research **(Add only: new to program)**

COURSES DELETED:

- CRIM 5310 Research Design **(Changed to EPPS 6310)**
- CRIM 5313 Descriptive & Inferential Statistics **(Split/Changed to EPPS 6313 & EPPS 7313)**
- CRIM 5316 Descriptive & Inferential Statistics **(Split/Changed to EPPS 6316 & EPPS 7316)**
- CRIM 5355 Introduction to Homeland Security **(Changed to PA 5355)**
- CRIM 5356 Pre-emptive Strategies & Tactics **(Changed to PA 5356)**
- CRIM 5357 Info Sharing and Communication **(Changed to PA 5357)**
- CRIM 5358 Soc Networks & Intelligence Led Policing **(Changed to PA 5358)**
- CRIM 5359 Prot Critical Resources & Infrastructure **(Changed to PA 5359)**
- CRIM 6340 Qualitative Criminology **(Changed to CRIM 7342)**
- CRIM 6346 Qualitative Research Methods **(Changed to EPPS 6346)**
- CRIM 6V96 Masters Thesis Research **(Delete only)**
- CRIM 7302 Seminar in Criminology Research **(Delete only)**

OTHER:

- CRIM 6v98 Analytical Writing Research **(Credit hours changed to 1-9 with no max)**

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Approved: _____

School/Department

Department of Computer Science

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http://www.utdallas.edu/dept/cs/

Faculty

Professors: Farokh Bastani, R. Chandrasekaran, Ding-Zhu Du, András Faragó, Gopal Gupta, Dung T. Huynh, Dan Moldovan, Simeon C. Ntafos, Balaji Raghavachari, Hsing-Mean (Edwin) Sha, Ivan H. Sudborough, Bhavani Thuraisingham, Klaus Truemper (Emeritus), , I-Ling Yen , Kang Zhang, Si Qing Zheng.
Associate Professors: Sergey Bereg, Lawrence Chung, Jorge A. Cobb, Ovidiu Daescu, Galigekere R. Dattatreya, Sanda Harabagiu, Vasileios Hatzivassiloglou , Jason Jue, Latifur Khan, Rym Mili, Neeraj Mittal, Ivor P. Page, B. Prabhakaran, Ravi Prakash, Kamil Sarac, Haim Schweitzer, Subbarayan Venkatesan, Yuke Wang, W. Eric Wong
Assistant Professors: Joao Cangussu, Kendra M.L. Cooper, Jing Dong, Xiaohu Guo, Kevin Hamlen, Murat Kantarcioglu, Yang Liu, Ying Liu, Vincent Ng, Weili Wu
Senior Lecturers: Rekha Bhowmik, Tim Farage, Herman Harrison, Sam Karrah, Lawrence King, Greg Ozbirn, Cort Steinhorst, Laurie Thompson, Nancy Van Ness

Deleted: Neeraj Mittal, Kamil Sarac,

Objectives

The Graduate Program in Computer Science provides intensive preparation in the design, programming, theory, and applications of computers. The Department of Computer Science offers courses of study leading to the M.S. in Computer Science, the M.S. in Computer Science with Major in Software Engineering, Ph.D. degree in Computer Science, and the PhD degree in Software Engineering. Training is provided for both academically oriented students and students with professional goals in the many business, industrial or governmental occupations requiring advanced knowledge of computer theory and technology. Courses and research are offered in a variety of subfields of computer science, including operating systems, computer architecture, computer graphics, pattern recognition, automata theory, combinatorics, artificial intelligence, data & network security, natural language processing, database design, computer networks, programming languages, software systems, analysis of algorithms, computational complexity, software engineering, software testing, software reliability, scheduling, visualization, fault-tolerant computing, parallel processing, telecommunications networks, telecommunications software, performance of systems, VLSI, computational geometry, and design automation.

A comprehensive program of evening courses is offered which enables part-time students to earn the master's degree or to select individual courses of interest.

Facilities

The Department of Computer Science has a large number of PCs, Sun Workstations, and several servers for research use. Laboratories are available for parallel processing, distributed systems, software engineering, high-performance computing, graphics, programming languages and systems, telecommunications, CAD and graph visualization, image understanding and processing, artificial intelligence, data mining, natural language processing, speech processing, and web technologies. The Department of Computer Science has an Internet 2 connection and all major computers on campus are linked by an Ethernet network.

In addition to the Computer Science faculty, there are individuals who are involved in computer related work in many other areas of the university, including the several physical and social sciences and in

various areas of business and management. Students majoring in computer science with interest in these important application areas have the opportunity to consult and work with talented faculty from a wide range of disciplines. The department actively participates in a number of interdisciplinary degree programs which include MS and Ph.D. in Computer Engineering, MS and Ph.D. in Telecommunications Engineering, and Ph.D. in Geospatial Information Sciences.

Admission Requirements

The University's general admission requirements are discussed here.

The student entering the Computer Science M.S. program should have an undergraduate preparation equivalent to a baccalaureate in a quantitative science, including calculus and linear algebra. However, special arrangements (requiring more than the minimal number of hours) can be made for students with good undergraduate preparation in other fields. Minimum requirements are:

- Bachelor's degree which includes 2 semesters of calculus and 1 semester of linear algebra.
- GPA of at least 3.0 (last 60 hours). GPA in quantitative courses of at least 3.3.
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Students lacking undergraduate preparation in Computer Science must complete the courses listed below. At the discretion of the graduate adviser, a diagnostic exam may be required. The required prerequisite courses common to all Master's students are:

CS 5301 Advanced Professional and Technical Communication
CS 5303 Computer Science I
CS 5330 Computer Science II
CS 5333 Discrete Structures
CS 5343 Algorithm Analysis and Data Structures
CS 5348 Operating Systems Concepts

Substitution of CS 5303, 5330 by professional experience will be considered. Additional prerequisite courses required for the various degree plans are:

For the Traditional Computer Science and Bioinformatics Tracks:
CS 5349 Automata Theory
CS 5390 Computer Networks
For the Networks and Telecommunications Track:
CS 3341 Probability and Statistics
CS 5390 Computer Networks
For the Intelligent Systems Track:
CS 5349 Automata Theory
For the Major in Software Engineering:
CS/SE 5354 Software Engineering

Degree Requirements

The University's general degree requirements are discussed here.

The student may choose a thesis plan or a non-thesis plan. The thesis plan requires a minimum of 27 hours of courses, plus completion of an approved thesis (six thesis hours). This thesis is directed by a supervising professor and must be approved by the head of the Department of Computer Science. The non-thesis plan also requires a minimum of 33 hours of courses.

By a judicious planning of courses chosen from the computer science curriculum, supervised and approved by the graduate adviser, students may pursue the M.S. degree in Computer Science while emphasizing specific areas of the discipline. Students may also choose to receive the M.S. degree in Computer Science with a Major in Software Engineering. Because of the rapidly changing nature of the computer science discipline, the specific courses required may change by the time of the student's admission. A listing of the required courses will be specified by the student's adviser. Specific degree requirements follow.

Core Requirements (15 hours)

Students are required to complete one of the following:

Traditional Computer Science Track

CS 6363 Design & Analysis of Computer Algorithms
CS 6378 Advanced Operating Systems
CS 6390 Advanced Computer Networks

Two of the following three courses:

CS 6353 Compiler Construction
CS 6360 Database Design
CS 6371 Structure & Design of Programming Languages

Networks and Telecommunications Track

CS 6352 Performance of Computer Systems and Networks
CS 6363 Design & Analysis of Computer Algorithms
CS 6378 Advanced Operating Systems
CS 6385 Algorithmic Aspects of Telecommunication Networks
CS 6390 Advanced Computer Networks

Intelligent Systems Track

CS 6360 Database Design
CS 6363 Design & Analysis of Computer Algorithms
CS 6364 Artificial Intelligence
CS 6375 Machine Learning
CS 6378 Advanced Operating Systems

Bioinformatics Track

CS 6325 Introduction to Bioinformatics
CS 6363 Design & Analysis of Computer Algorithms
CS 6360 Database Design

Two of the following four courses:

CS 6333 Algorithms in Computational Biology
CS 6365 Data and Text Mining for Computational Biology
CS 6383 Computational Systems Biology
CS 6393 Advanced Algorithms in Biology

Major in Software Engineering (M. S. C. S.)

CS/SE 6361 Requirements Engineering
CS/SE 6362 Software Architecture and Design
CS/SE 6367 Software Testing, Validation and Verification

CS/SE 6387 Advanced Software Engineeering Project

One of the following four courses:

CS 6353 Compiler Construction
CS/SE 6360 Database Design
CS 6371 Advanced Programming Languages
CS/SE 6388 Software Project Planning and Management

Students must satisfy the core requirements by either earning a 3.2 minimum grade point average OR by earning a 3.0 minimum grade point average in the five core courses and taking an extra approved elective (beyond the minimum degree requirements of 33 hours) and earning a grade of B or better in this additional elective.

Electives (minimum of 18 hours)

Five [15 credit hours] 6000/7000/8000 level elective CS courses, or six hours of thesis or project courses plus three elective courses [9 + 6 = 15 credit hours], with approval of a graduate adviser; a minimum grade point average of 3.0 is required. Courses that are prerequisites to the student's core requirements are especially recommended. Approved electives must be taken to make a minimum of 33 hours.

While the Department of Computer Science offers both the Master of Science in Computer Science and the Master of Science in Computer Science with Major in Software Engineering degrees, students are not permitted to pursue both degrees.

Doctor of Philosophy

The Department of Computer Science offers Ph.D. degrees in Computer Science and in Software Engineering.

Each degree program is tailored to the student. The student must arrange a course program with the guidance and approval of a faculty member chosen as his/her graduate adviser. Adjustments can be made as the student's interests develop and a specific dissertation topic is chosen.

Admission Requirements

Deleted: CS/SE 6354 Advanced Software Engineering

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The University's general admission requirements are discussed here.

A student may be admitted under two possible options. The student must have:

- A Master's degree in computer science or its equivalent, and
- A GPA of at least 3.5 and GRE of at least 1200 (verbal and quantitative) or 1800 (verbal, quantitative, and analytical) is advisable based on our experience with student success in the program; or
- A B.S. in related area that includes two semesters of calculus and linear algebra with
- GPA of at least 3.5 in the last 60 hours, and
- A GRE of at least 1300 (verbal and quantitative) is advisable based on our experience with student success in the program.

Degree Requirements

The University's general degree requirements are discussed here.

Core requirements:

The core requirements for the Ph.D. degree in Computer Science are the same as the ones for the M.S. in Computer Science or the M.S. in Computer Science with Major in Software Engineering; the core requirements for the Ph.D. degree in Software Engineering are the same as those for the M.S. in Computer Science with Major in Software Engineering.

- Pass a qualifying examination.
  - Pass, with a grade of B or better, courses chosen as follows:

    CS 6382 Theory of Computation; in addition, students pursuing the Ph.D. degree in Software Engineering should take CS/SE 6389 _ Formal Methods and Programming Methodology.

  - Two CS/SE 7000 and above level courses

- Sufficient CS electives for a total of at least 75 hours beyond the baccalaureate degree. At least 9 hours of organized advanced Computer Science electives must be taken at UT Dallas. The student is encouraged to consult with an adviser in choosing electives.

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Dissertation

A dissertation is required and must be approved by the graduate program. A student must arrange for a dissertation adviser willing to guide this dissertation. The student must have a dissertation supervising committee that consists of no less than four members of whom at least three must be from the Computer Science faculty. The dissertation may be in computer science exclusively or it may involve considerable work in an area of application.

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Department of Molecular and Cell Biology

http://www.utdallas.edu/nsm/biology/

Faculty

Professors: Hans Bremer (emeritus), Lee A. Bulla, Santosh R. D'Mello, Rockford K. Draper, Juan E. González, Donald M. Gray, Stephen D. Levene, Betty S. Pace, Lawrence J. Reitzer, C. S. Rupert (emeritus), Li Zhang, Michael Zhang
Associate Professors: Gail A.M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Dennis L. Miller, Stephen Spiro
Assistant Professors: Tianbing Xia, Zhenyu Xuan
Senior Lecturers: Irena Borovkov, Mehmet Candas, Vincent P. Cirillo, Wen-Ju Lin, Robert Marsh, Ruben Ramirez, Scott A. Rippel, Illya Sapoznikov, Wen-ho Yu

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Objectives

The Graduate Program offers training in those aspects of molecular and cell biology that are the bases of modern biological and biomedical sciences.

The Master of Science degree is designed for students who wish to learn the methodology of research in molecular and cell biology and the fundamentals of problem solving in these areas.

The Master of Science degree without thesis is intended for students who wish to acquire a working knowledge of biotechnology, for other students who seek to gain knowledge of modern biology without the intent to seek positions as technical laboratory personnel, and for those students who are seeking additional preparation for admission to professional schools.

The Master of Arts in Teaching degree in Science Education with a specialization in Biology is designed to strengthen the knowledge of high school teachers in fundamental aspects of biology and to bring them up to date on advances in this rapidly developing field. For further information on this program and for course descriptions, see the Science/Mathematics Education section of this catalog.

The Doctor of Philosophy degree with a major in Molecular and Cell Biology is appropriate for students who show a potential for originality in research and is designed to develop a critical and analytical understanding of current developments which will enable them to keep abreast of the rapid advances that are likely to occur in the biological and biomedical fields.

The M.S. and Ph.D. degree plans offer students the opportunity to prepare for academic careers in colleges and universities including medical and dental schools, and for careers in industrial, hospital, public health, environmental and governmental laboratories and organizations.

Specializations

First-year students will normally complete a body of core courses that emphasize fundamental aspects of biochemistry, biophysics, molecular biology, and cell biology. Students may then proceed to advanced course work in any of these four general areas. Elective courses are open to all qualified students as recommended by their supervising committees. First year students are also encouraged to participate in rotations through research laboratories (required for Ph.D.-track students).

In the second year, research is initiated under the supervision of one or more of the Molecular and Cell Biology faculty. The faculty and their research interests are listed below. Prospective students should recognize that it is possible to do research in closely related areas not mentioned in this list, provided a faculty member is prepared to supervise the work.

Gail A.M. Breen, Isolation and characterization of the genes that code for proteins of the mammalian mitochondrion; mitochondrial biogenesis; eukaryotic gene regulation.
Lee A. Bulla, Molecular basis of biopesticides.
John G. Burr, Eukaryotic growth regulation; mechanism of viral oncogenic transformation.
Santosh D'Mello, Molecular control of neuronal apoptosis
Jeff L. DeJong, Eukaryotic transcription; initiation and activation of RNA polymerase II.
Rockford K. Draper, Membrane traffic; protein toxins; bio-nanotechnology
Juan E. González, Cell-cell interactions, role of exopolysaccharides in nodulation of legumes by rhizobia; molecular genetics of plant-microbe interactions.
Donald M. Gray, Study of nucleic acids and single-strand DNA binding proteins.
Ernest M. Hannig, Control of protein synthesis; genetic and biochemical analysis of translation initiation factors; protein-protein interactions.
Stephen D. Levene, Structure and dynamics of nucleic acids and nucleic acid-protein complexes in solution.
Dennis L. Miller, Structure and organization of mitochondrial DNA; mitochondrial gene expression; RNA editing; mitochondrial biogenesis.
Betty S. Pace, Gene therapy, sickle cell disease.
Lawrence J. Reitzer, Regulation of gene expression and metabolism in prokaryotes.
Stephan Spiro, Regulation of bacterial gene expression by environmental signals; genetic and physiological adaptation to stress.
Tianbing Xia, Molecular recognition; RNA structure and RNA-protein interaction; conformational dynamics; femtochemistry
Zhenyu Xuan, Computational biology and bioinformatics
Li Zhang, Molecular mechanisms of cell signaling, heme signaling and oxygen sensing, genomics, and systems biology
Michael Zhang, Computational biology; gene regulation and epigenomics

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Facilities

Major items of equipment used by the faculty and available for graduate student research include a Leica TCS SP2 AOBS confocal microscope system, complete Spectra-Physics femtosecond laser system, Becton Dickson fluorescence activated cell sorter, Veeco MultiMode SPM atomic force microscope, Molecular Dynamics PhosphoImagers, BioRad real-time polymerase chain reaction instruments, Beckman scintillation counters and Optima ultracentrifuges, and a Jasco J-715 spectropolarimeter. Individual laboratories are well-equipped with instrumentation needed for research in molecular and cell biology, including thermal cyclers, spectrophotometers, chromatography and electrophoresis systems, chemical hoods, and mammalian cell culture facilities.

Deleted: ThermoFinnigan LC QDECA XP ion trap mass spectrometer,
Deleted: Perkin Elmer DNA chip reader,

Other shared biology facilities include environmental chambers, a staffed media kitchen with autoclaves and washing machines, a darkroom with an x-ray film developer, and an electronics workshop. There is a modern research animal housing facility on campus, as well as a GE 500 MHz FT multinuclear magnetic resonance spectrometer.

Admission Requirements

The University's general admission requirements are discussed here.

For full participation in the Graduate Program in Molecular and Cell Biology, the student should have a good background in calculus, general physics, organic chemistry, biochemistry, and general biology, including genetics. Entering students not having this background may be required to take some additional course work in their first year or in the summer immediately preceding entry. A minimum GRE score of 1000 (verbal plus quantitative) is advisable based on our experience with student success in the program.

Degree Requirements

The University's general degree requirements are discussed here.

Upon satisfactory completion of the core courses (and, for Ph.D. candidates, a favorable evaluation following the Spring semester as described below), a Supervising Committee is appointed for each student (except non-thesis M.S. students) based upon mutual agreement between student and faculty. The Supervising Committee, with the Supervising Professor as chairperson, will help the student plan an elective course curriculum and will oversee the student's research and thesis or dissertation.

Master of Science

All students seeking the Master of Science degree in Molecular and Cell Biology must satisfactorily complete a total of at least 36 graduate semester hours which must include the following core courses: BIOL 5410, BIOL 5420, BIOL 5430, and BIOL 5440.

M.S. students intending to submit a thesis must, in addition to the core courses specified above, satisfactorily complete a further 20 hours of Biology courses which includes BIOL 6193, BIOL 8398, and a minimum of 6 credit hours of general electives for which a letter grade is assigned. The remainder of the credit hours usually reflects experimental research but may also be based on literature research as determined by mutual agreement of the student and Supervising Committee. For M.S. (thesis) students, the maximum number of Pass/Fail credits allowed within the 36 credit hour minimum is 13 semester credit hours.

M.S. (non-thesis) students must, in addition to the core courses specified, satisfactorily complete a minimum of four general elective courses in Biology (for which a letter grade is assigned) for a minimum of 9 credit hours, up to 11 semester credit hours of special electives, and/or, with approval of the Graduate Adviser, other graduate courses. For non-thesis M.S. students, the maximum number of Pass/Fail credits allowed within the 36 credit hour minimum is 11 semester credit hours.

A Master of Science Degree in Biotechnology is also offered through the Department of Molecular and Cell Biology.

In addition to the above Master of Science Degrees, a Master of Science in Bioinformatics and Computational Biology (BCBM) is offered jointly by the Departments of Mathematical Sciences and Molecular and Cell Biology. This program combines coursework from the disciplines of biology, computer science, and mathematical sciences. Faculty from both Mathematical Sciences (MMS) and Molecular and Cell Biology (MCB) participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments participate in advising students.

See the Department of Mathematical Sciences for more information on this degree program.

Doctor of Philosophy

Item #12Z

All Ph.D. students must satisfactorily complete a total of at least 90 credit hours beyond the bachelor's degree. Generally, all core courses are mandatory. In special cases the requirement for a core course can be substituted, but only with the permission of the instructor and the graduate adviser, and usually only after examination. Students must include a minimum of four general elective courses in Biology (for which a letter grade is assigned) for a minimum of 9 credit hours. After core courses BIOL 5410, BIOL 5420, BIOL 5430 and BIOL 5440 [and, in addition, two laboratory rotations, BIOL 6V02 –(The Art of Scientific Presentation) and BIOL 6193] have been completed, students are evaluated following the Spring semester. The evaluation is based upon performance in the core classes, laboratory rotations, and performance as teaching assistants (if applicable). Students who pass this evaluation must then pass an oral qualifying examination within three semesters to determine the student's aptitude for continuation of dissertation research. A dissertation defense will be conducted after the dissertation has been written. All students are required to submit a minimum of one manuscript for publication in an internationally recognized, peer-reviewed scientific journal. There is no foreign language requirement.

Department of Chemistry

http://www.utdallas.edu/dept/chemistry/

Faculty

Robert A. Welch Chair in Chemistry; Professor of Chemistry: Ray H. Baughman
Cecil and Ida Green Distinguished Chair in Systems Biology; Professor of Chemistry: A. Dean Sherry
Professors: Kenneth J. Balkus, Jr., Rockford K. Draper (Biology), John P. Ferraris, Bruce E. Gnade (Electrical Engineering), Inga H. Musselman,
Associate Professors: Michael C. Biewer, Gregg R. Dieckmann, Jinming Gao (UT Southwestern), Warren J. Goux, Paul Pantano, John W. Sibert
Assistant Professors: Jung-Mo Ahn, Mihaela C. Stefan, Steven O. Nielsen, Jie Zheng
Affiliated Professors: Lee A. Bulla (Biology), Anvar A. Zakhidov (Physics)
Research Professors: Garry E. Kiefer, Duck Joo Yang
Emeritus Professors: Richard A. Caldwell
Senior Lecturers: Sergio Cortes, Sandhya R. Gavva, Claudia Taenzler

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Objectives

The Ph.D. program is designed to produce graduates with a focus on innovation and problem solving in current materials, biotechnology, and industrial process research and development. These graduates, with their broad course background, research skills, and practical attitudes should find ready employment in industry or academic positions. A spectrum of courses provides the student with a broad knowledge of chemistry.

The Master of Science program offers students the opportunity to prepare for positions in industry, for further training in related scientific fields, or for further training in chemistry.

Facilities

The department has the equipment and facilities necessary for routine use by its faculty and students in teaching and research. Larger items include: 270 MHz (2), and 500 MHz multi-nuclear FT-NMR spectrometers; a powder x-ray diffractometer; assorted spectrophotometers utilizing fluorescence, phosphorescence and absorption; three protein synthesizers; gel permeation chromatographs; workstations with molecular modeling software; and scanning tunneling and atomic force microscopes. Chemistry also participates in the Alan G. MacDiarmid NanoTech Institute which houses instrumentation for modern materials science research. Facilities external to chemistry, but readily available to its use, include a library, the computer center, the cleanroom, and well-equipped machine and electronics shops.

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Admission Requirements

The University's general admission requirements are discussed here.

Undergraduate preparation equivalent to the degree of Bachelor of Science in Chemistry is required. The Chemistry program has no other requirements above the general admission requirements beginning on page 24. However, admission is competitive and is decided case by case on the basis of the quality of previous relevant academic work, GRE scores, letters of reference, the student's statement of academic interests and, for foreign students, evidence of fluency in English. Foreign students with TOEFL scores

less than 600 (paper test), 250 (computer test), or 100 (internet test) are admitted only in special circumstances.

Degree Requirements

The University's general degree requirements are discussed here.

Graduate students in chemistry are expected to demonstrate fundamental knowledge of lecture and laboratory skills by completing the following courses with a grade of B or better.

Core Courses (12 hours)

CHEM 5314 Advanced Physical Chemistry
CHEM 5331 Advanced Organic Chemistry I
CHEM 5341 Advanced Inorganic Chemistry I
CHEM 5355 Analytical Techniques I

Master of Science

A minimum of 30 total graduate semester hours is required.
The M.S. degree can be pursued on a full- or part-time basis.

Other Course Requirements

The remaining requirements beyond the 12-hour core listed above may be satisfied in one of the two ways listed below.

1. Presentation and defense of a written master's thesis. The student must complete, as a minimum, 15 credit hours of research or other graduate electives plus CHEM 8398. A Supervising Committee will be appointed to guide the student's thesis work and to assess the completed thesis.

2. Completion of an approved internship in an industrial or governmental laboratory. The student must complete, as a minimum, 18 credit hours of research, chemistry internship or other graduate electives.

Three of the graduate semester hours beyond the core may be fulfilled by taking an approved graduate elective course.

A Supervising Committee must approve an internship in advance. The final written report must be defended before this committee and filed in the Chemistry department office.

Doctor of Philosophy

Normally pursued by full-time students enrolled in a minimum of 9 credit hours of approved graduate level courses per semester.

Other Course Requirements

In addition to the 12-semester hour core course requirements listed above, students seeking the Ph.D. degree must take two upper level elective courses that are approved by the student's faculty research advisor and the Chemistry Graduate Advisor. Ph.D. students are expected to complete these six required courses within the first two years of their enrollment. CHEM 8399 is also required as part of the preparation of the dissertation. Additional courses may be required by the student's Supervisory Committee.

Well-prepared students may request substitution of portions of the course requirements from the Committee on Graduate Studies in Chemistry. At least three organized courses must be taken at the University of Texas at Dallas. The opportunity exists to take elective courses during their second and subsequent years.

Qualifying Examination: Original Research Proposal

All Ph.D. students must take the qualifying examination. In the second year, students seeking the Ph.D. degree are required to write, present, and defend an original research proposal. In addition to providing valuable experience to the student, this exam is used to assess the student's originality and skills in organizing an effective approach to solving a novel problem. The results of this examination will be one criterion upon which admission to doctoral candidacy will be judged.

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Research

Students have the option of completing a thesis Master's degree as part of their doctoral candidacy preparation, unless this requirement has been satisfied at the time of admission. The doctoral research project may be conducted in the same laboratory as the Master's degree research or, in order to gain a broader research experience, in another laboratory. A manuscript embodying a substantial portion of the Ph.D. dissertation research accomplished by the student must be submitted to a suitable professional refereed journal prior to the public seminar and dissertation defense. A public seminar, successful defense of the dissertation, and its acceptance by the Supervising Committee and the Graduate Dean conclude the requirements for the Ph.D.

Representative Research Areas

Within the Chemistry program, opportunities exist for course work and/or research in nanotechnology, biochemistry/biotechnology, organic, inorganic, materials, analytical, and physical chemistry. The opportunity to take course work in several of the other university programs allows the student to prepare for interdisciplinary work. Specific topics within these broad research areas include nanoscience (carbon nanotubes, sensors, actuators, nanoscale devices, synthesis of nanoporous materials); organic solid-state and polymer chemistry (energy storage, electrochromism, light-emitting polymers, solar cells, membrane separations); inorganic solid-state (zeolites, membranes, laser ablation, sensors, fuel cells, electrospinning); biological NMR (structural biology, using NMR active tracers to follow metabolism in cells, isolated tissues and in vivo); supramolecular chemistry (design of novel host-guest systems; biologically responsive MRI agents, design, synthesis and study of macrocyclic receptors with applications in catalysis, materials science, and medicine); scanning probe microscopy (instrument development, image contrast, application to polymer microstructure); bioanalytical and bionano chemistry, synthetic chemistry (macrocycles, small protein domains to study membrane fusion; DNA recognition and modification; metalloprotein function); biochemistry/enzymology (study of oxidative stress; oxidative metabolism of signaling molecules; enzymology of monooxygenation, molecular modeling; and catalysis).

Department of Mathematical Sciences

http://www.utdallas.edu/nsm/math/

Faculty

Professors: Larry P. Ammann, Michael Baron, Sam Efromovich, M. Ali Hooshyar, Wieslaw Krawcewicz, Patrick L. Odell (Emeritus), Istvan Ozsvath, Viswanath Ramakrishna, Ivor Robinson (Emeritus), Robert Serfling, Janos Turi, John W. Van Ness (Emeritus), John Wiorkowski
Associate Professors: Pankaj Choudhary, Mieczyslaw Dabkowski
Assistant Professors: Yan Cao, Tobias Hagge
Adjunct Professors: Jose Carlos Gomez Larranage, Adolfo Sanchez Valenzuela
Affiliated Faculty: Herve Abdi (BBS), Raimund J. Ober (EE), Alain Bensoussan (SOM), Thomas Butts and Titu Andreescu (SME)
Senior Lecturers: Frank R. Allum, Malgorzata Dabkowska, Nermine El Sissi, Anatoly Eydelzon, Bentley Garrett, Yuly Koshevnik, David L. Lewis, Charles R. McGhee, Joanna R. Robinson, William Scott, Paul Stanford

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Objectives

The Mathematical Sciences Department at The University of Texas at Dallas offers graduate study in five majors: applied mathematics, engineering mathematics, mathematics, statistics, and an interdisciplinary degree in Bioinformatics and Computational biology. The degree programs offer students the opportunity to prepare for careers in these disciplines themselves or in any of the many other fields for which these disciplines are such indispensable tools. As other sciences develop, problems which require the use of these tools are numerous and pressing.

In addition to a wide range of courses in mathematics and statistics, the Mathematical Sciences Department offers a unique selection of courses that consider mathematical and computational aspects of engineering, biology and other scientific problems.

The Master of Science degree programs are designed for persons seeking specializations in applied mathematics, engineering mathematics, mathematics, statistics, bioinformatics and computational biology.

The Master of Science degree is available also for those who plan to teach mathematical sciences above the remedial level at a community college or at a college or university. The Master of Science degree is recommended as a minimum, since an earned doctorate is sometimes required.

For information concerning the Master of Arts in Teaching in Mathematics Education, designed for persons who are teaching in grades 6-12, see the Science and Mathematics Education section.

The Doctor of Philosophy degree programs cover two basic areas of concentration: statistics and applied mathematics. They are designed for those who plan to pursue academic, financial or industrial careers.

Facilities

The faculty, staff and students have access to a large network of Sun workstations and servers on campus. In addition, the Department has a classroom equipped with a cluster of 20 high-end Linux PCs that are used for instruction and special research purposes.

Admission Requirements

The University's general admission requirements are discussed here.

Specific additional admission requirements for students in Mathematical Sciences follow. Students lacking undergraduate prerequisites for graduate courses in their area must complete these prerequisites or receive approval from the graduate adviser and the course instructor before registering.

One of the components of a student's academic history which is evaluated when the student is seeking admission to the graduate program is his/her performance on certain standardized tests. Since these tests are designed to indicate only the student's potential for graduate study, they are used in conjunction with other measures of student proficiency (such as GPA, etc.) in determining the admission status of a potential graduate student. Accordingly, there is no rigid minimum cut-off score for admission to the program. However, a student with at least a Graduate Record Examination (GRE) combined score of 1050 with at least 550 on the math portion would have a reasonable probability of admission as a Master's student, assuming that the student's other credentials were in order. Similarly, a student with a GRE score of 1200 (with at least 650 in the quantitative portion) would have a reasonable probability of admission as a Ph.D. student, assuming that all other credentials were in order. Higher standards prevail for students seeking Teaching Assistantships.

Degree Requirements

Master of Science

The University's general degree requirements are discussed here.

Students seeking a Master of Science in Mathematical Sciences must complete a total of 12 three-credit hour courses. In some cases, credit for 3 hours is approved for good mathematics background. The student may choose a thesis plan or a non-thesis plan. In the thesis plan, the thesis replaces two elective courses with completion of an approved thesis (six thesis hours). The thesis is directed by a Supervising Professor and must be approved by the Head of the Mathematical Sciences Department.

Each student must earn a 3.0 minimum GPA in the courses listed for the student's program.

Applied Mathematics Major

MATH 5301-5302 Elementary Analysis I and II (or equivalent)
MATH 6303 Theory of Complex Functions
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6319-6320 Principles and Techniques in Applied Mathematics I and II
MATH 6308 Inverse Problems and their Applications
MATH 6321 Optimization
Plus two guided electives.

Engineering Mathematics Major

MATH 5301-5302 Elementary Analysis I and II (or equivalent)
MATH 6303 Theory of Complex Functions
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6319-6320 Principles and Techniques in Applied Mathematics I and II
MATH 6331 Systems, Signals and Control
MATH 6305 Mathematics of Signal Processing
plus two guided electives.

Mathematics Major

MATH 5301-5302 Elementary Analysis I and II (or equivalent)
MATH 6303 Theory of Complex Functions
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6301 Real Analysis
MATH 6302 Real and Functional Analysis
MATH 6306 Topology and Geometry
MATH 6311 Abstract Algebra I
plus two guided electives.

Statistics Major

Students seeking a Master of Science in Mathematical Sciences with a major in Statistics must complete the following core courses:
STAT 6331 Statistical Inference I
STAT 6337-38 Statistical Methods I, II
STAT 6339 Linear Statistical Models
STAT 6341 Numerical Linear Algebra and Statistical Computing

One course from each of any two of the following sets of courses:
{STAT 6329, STAT 6343, STAT 7334} Stochastic Processes or Experimental Design or Nonparametric and Robust Statistical Methods
{STAT 6348, STAT 7331} Multivariate Analysis
{STAT 6347, STAT 7338} Time Series Analysis

Students must choose remaining courses from among the following electives:
MATH 6301, MATH 6302, MATH 6313, MATH 6331 or any 6300- or 7300-level statistics courses. Also, a maximum of two of the following prerequisite 5000-level courses may be counted as electives: MATH 5301, 5302, Elementary Analysis I, II and STAT 5351, 5352 Probability and Statistics I, II.

Other Requirements

Electives must be approved by the graduate adviser. Typically, electives are 6000- and 7000-level mathematical sciences courses. Courses from other disciplines may also be used upon approval.

Substitutions for required courses may be made if approved by the graduate adviser. Instructors may substitute stated prerequisites for students with equivalent experience.

Master of Science in Bioinformatics and Computational Biology

Master of Science in Bioinformatics and Computational Biology (BCBM) is offered jointly by the Departments of Mathematical Sciences and Molecular and Cell Biology. This program combines coursework from the disciplines of biology, computer science, and mathematical Sciences. The BCBM program seeks to answer the demand for a new breed of scientist that has fundamental understanding in the fields of biology, mathematics, statistics, and computer science. With this interdisciplinary training, these scientists will be well prepared to meet the demand and challenges that have arisen and will continue to develop in the biotechnology arena.

Faculty from both Mathematical Sciences (MMS) and Molecular and Cell Biology (MCB) participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments participate in advising students.

For the Master's degree in Bioinformatics and Computational Biology, beginning students are expected to have completed multivariate calculus, linear algebra, two semesters of general Chemistry, two semester of organic Chemistry, two semesters of general physics, programming in C/C++, and two semesters of biology.

Requirements for completing a degree in BCBM are:

Core courses:

BIO 5410 Biochemistry
BIO 5420 Molecular Biology
BIO 5381 Genomics
STAT 5351 Probability and Statistics I
STAT 5352 Probability and Statistics II
MATH 6341 Bioinformatics

Additional core courses for the Computational Biology track:
MATH 6313 Numerical Analysis
MATH 6343 Computational Biology
MATH 6345 Mathematical Methods in Medicine & Biology

Additional core courses for the Bioinformatics track:

CS 5333 Discrete Structures
CS 5343 Algorithms Analysis and Data Structures
CS 6360 Database Design

Elective: A minimum of 7 semester credit hours of elective, approved by the student's adviser. Typically, electives are 6000- and 7000- level courses in mathematical sciences, biology or computer science. Courses from other disciplines may also be used upon approval.

Doctor of Philosophy

The University's general degree requirements are discussed here.

Each Doctor of Philosophy degree program is tailored to the student. The student must arrange a course program with the guidance and approval of the graduate adviser. Adjustments can be made as the student's interests develop and a specific dissertation topic is chosen. A minimum of 90 semester hours beyond the bachelor's degree is required.

Applied Mathematics Major

MATH 6301 Real Analysis
MATH 6302 Real and Functional Analysis
MATH 6303 Theory of Complex Functions I
MATH 6306 Topology and Geometry
MATH 6311 Abstract Algebra I
MATH 6313 Numerical Analysis
MATH 6315 Ordinary Differential Equations
MATH 6316 Differential Equations
MATH 6318 Numerical Analysis of Differential Equations
MATH 6319-6320 Principles and Techniques in Applied Mathematics I and II
MATH 7313 Partial Differential and Integral Equations I
MATH 7319 Functional Analysis

Statistics Major

MATH 6301 Real Analysis
MATH 6302 Real and Functional Analysis
STAT 6331- 6332 Statistical Inference I, II
STAT 6337- 6338 Statistical Methods I, II
STAT 6339 Linear Statistical Models
STAT 6344 Probability Theory I
STAT 7330 Decision Theory
STAT 7331 Multivariate Analysis
STAT 7334 Nonparametric Statistics
STAT 7338 Time Series Modeling and Filtering
STAT 7345 Stochastic Processes
MATH 6303 Theory of Complex Functions I, or MATH 6313 Numerical Analysis, or
MATH 6315 Ordinary Differential Equations I, or MATH 7319 Functional Analysis

Electives and Dissertation

An additional 18-24 credit hours for Applied Math and 18-24 credit hours for Statistics designed for the student's area of specialization are taken as electives in a degree plan designed by the student and the graduate adviser. This plan is subject to approval by the Department Head. After completion of the first 3 or 4 academic semesters of the course program, the student must pass a Ph.D. Qualifying Examination in order to continue on to the research and dissertation phase of the Ph.D. program.
Finally, a dissertation is required and must be approved by the graduate program. Areas of specialization include:

- **Applied Mathematics**: applied analysis, biomathematics, differential equations, relativity, scattering theory, systems theory, signal processing.

- **Statistics**: statistical inference, applied statistics, statistical computing, probability, stochastic processes, linear models, time series, statistical classification, multivariate analysis, nonparametric and robust statistics, asymptotic theory.

Other specializations are possible, including interdisciplinary topics. There must be available a dissertation research adviser or group of dissertation advisers willing to supervise and guide the student. A dissertation Supervising Committee should be formed in accordance with the U.T. Dallas policy memorandum (87-III.25-48). The dissertation may be in Mathematical Sciences exclusively or it may involve considerable work in an area of application.

Research

Within the Mathematical Sciences programs opportunities exist for work and/or research in applied mathematics, engineering mathematics, mathematics and statistics. The opportunity to take course work in several of the other university programs also allows the student to prepare for interdisciplinary work. Special topics within research areas include functional analysis, operator theory, differential and integral equations, optimization, numerical analysis, system theory and control with application in material and molecular sciences, inverse problems with applications in geosciences and medical sciences, relativistic cosmology, differential geometry, applications of topology to biology, mathematical and computational biology with applications in cardiovascular physiology, neurobiology and cell biology; probability theory, applied probability, stochastic processes, mathematical statistics, statistical inference, asymptotic theory, statistical time series, Bayesian analysis, robust multivariate statistical methods, robust linear models, robust and nonparametric methods, sequential analysis, statistical computing, signal processing, remote sensing, change-point problems, forecasting and applications in their respective areas such as energy finance, semiconductor manufacturing, psychology, actuarial sciences, physical and medical sciences.

For a complete list of faculty and their areas of research, visit the website www.utdallas.edu/nsm/math/faculty .

Item #12CC

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: **10/17/09**
TO: **Graduate Dean**
FROM: **Euel Elliott**

Please indicate with an X if your department catalog copy has no changes: _____

SCHOOL: **Economic, Political and Policy Sciences**

DEPARTMENT: **ECONOMICS**

BASIS FOR CATALOG CHANGES:

Changes reflect course renumbering at the direction of the University.

NEW PROGRAMS/DEGREES/CERTIFICATES:

Course numbering and changes in credit hour changes should be reflected in the two categories below.

NEW COURSES ADDED:

• ECON 6301 Microeconomics Theory I	**(Renumbered from ECON 5301)**
• ECON 6302 Macroeconomics Theory I	**(Renumbered from ECON 5302)**
• ECON 6303 Microeconomic Theory for Applications	**(Renumbered from ECON 5321)**
• ECON 6304 Macroeconomic Theory for Applications	**(Renumbered from ECON 5322)**
• ECON 6305 Mathematical Economics	**(Renumbered from ECON 5309)**
• ECON 6306 Applied Econometrics	**(Renumbered from ECON 5311)**
• ECON 6320 Game Theory for the Social Sciences	**(Renumbered from ECON 5325)**
• ECON 7301 Microeconomics Theory II	**(Renumbered from ECON 6307)**
• ECON 7302 Macroeconomics Theory II	**(Renumbered from ECON 6308)**
• ECON 7309 Econometrics II	**(Renumbered from ECON 6319)**
• ECON 7316 Game Theory	**(Renumbered from ECON 6366)**
• ECON 7363 Public Economics II	**(Renumbered from ECON 6365)**
• ECON 8301 Microeconomics III	**(Renumbered from ECON 6312)**
• ECON 8309 Econometrics III	**(Renumbered from ECON 6319)**
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COURSES DELETED:

• ECON 5301 Microeconomics Theory I	**(Changed to ECON 6301)**
• ECON 5302 Macroeconomics Theory I	**(Changed to Econ 6302)**
• ECON 5309 Mathematical Economics	**(Changed to Econ 6305)**
• ECON 5311 Applied Econometrics	**(Changed to Econ 6306)**

• ECON 5321	Microeconomic Theory for Applications	**(Changed to Econ 6303)**
• ECON 5322	Macroeconomic Theory for Applications	**(Changed to Econ 6304)**
• ECON 5325	Game Theory for the Social Sciences	**(Changed to Econ 6320)**
• ECON 6307	Microeconomics Theory II	**(Changed to Econ 7301)**
• ECON 6308	Macroeconomics Theory II	**(Changed to Econ 7302)**
• ECON 6312	Econometrics III	**(Changed to Econ 8309)**
• ECON 6314	Structural Equation & Multilevel Modeling	**(changed to EPPS 7318)**
• ECON 6316	Spatial Econometrics	**(Changed to EPPS 7368)**
• ECON 6319	Microeconomics Theory III	**(Changed to Econ 8301)**
• ECON 6325	Cost Benefit Analysis	**(Changed to Econ 7304)**
• ECON 6345	Innovation Dynamics & Economic Change	**(Changed to POEC 7327)**
• ECON 6365	International Trade	**(Changed to ECON 6355)**
• ECON 6366	Game Theory	**(Changed to ECON 7316)**
• ECON 7380	Applied Multivariate Analysis	**(changed to EPPS 7380)**
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Approved: _____
School/Department

Electrical Engineering Course Descriptions

EEMF 5283 (PHYS 5283) Plasma Technology Laboratory (2 semester hours) Laboratory will provide a hands-on experience to accompany EE 5383. Topics to include: Vacuum technology [pumps, gauges, gas feed], plasma uses [etch, deposition, lighting and plasma thrusters] and introductory diagnostics. Co-requisite: EEMF 5383. Recommended Co-requisite: EEMF 7171. (0-2) R

EEGR 5300 Advanced Engineering Mathematics (3 semester hours) Advanced mathematical topics needed in the study of engineering. Topics may include advanced differential equations, linear algebra, vector calculus, complex analysis, and numerical methods. Credit does not apply to the 33 hour M.S.E.E. requirement. (3-0) R

EEGR 5301 (CS 5301) Professional and Technical Communication (3 semester hours) EE 5301 utilizes an integrated approach to writing and speaking for the technical professions. The advanced writing components of the course focus on writing professional quality technical documents such as proposals, memos, abstracts, reports, letters, emails, etc. The advanced oral communication components of the course focus on planning, developing, and delivering dynamic, informative and persuasive presentations. Advanced skills in effective teamwork, leadership, listening, multimedia and computer generated visual aids are also emphasized. Graduate students will have a successful communication experience working in a functional team environment using a real time, online learning environment. (3-0) Y

EERF 5305 Radio Frequency Engineering (3 semester hours) Introduction to generation, transmission, and radiation of electromagnetic waves. Microwave-frequency measurement techniques. Characteristics of guided-wave structures and impedance matching. Fundamentals of antennas and propagation. Prerequisite: EE 4301 or equivalent. (3-0) Y

EEMF 5320 Introduction to Devices and Circuits (3 semester hours) This course provides a background in Electrical Engineering for students entering the M.S.E.E. program from other fields of science and engineering. Topics include circuit analysis and simulation, semiconductor device fundamentals and operation, and basic transistor circuits. Credit does not apply to the 33 hour M.S.E.E. requirement. Prerequisite: differential equations. (3-0) R

EECT 5321 Introduction to Circuits and Systems (3 semester hours) Continuation of EE 5320. Topics include analog circuits, digital circuits, digital systems and communication systems. Credit does not apply to the 33 hour M.S.E.E. requirement. (3-0) R

EEDG 5325 (CE 5325) Hardware Modeling Using HDL (3 semester hours) This course introduces students to hardware description languages (HDL) beginning with simple examples and describing tools and methodologies. It covers the language, dwelling on fundamental simulation concepts. Students are also exposed to the subset of HDL that may be used for synthesis of custom logic. HDL simulation and synthesis labs and projects are performed using commercial and/or academic VLSI CAD tools. Prerequisite: EE 3320 or equivalent. (3-0) T

EESC 5350 Signals, Systems, and Digital Communications (3 semester hours) Advanced methods of analysis of electrical networks and linear systems. Laplace transforms, Fourier series, and Fourier transforms. Response of linear systems to step, impulse, and sinusoidal inputs. Convolution, system functions, and frequency response. Z transforms and digital systems. Fundamentals of digital communication systems such as information, digital transmission, channel capacity, modulation and demodulation techniques are introduced. Signaling schemes and performance of binary as well as M-ary modulated digital communication systems are introduced. Overall design considerations and performance evaluation of various digital communication systems are discussed. Prerequisite: EE 3300 or equivalent. (3-0) R

EESC 5360 Introduction to Communications and Signal Processing (3 semester hours) This course is designed to provide the necessary background for someone with a technical degree to enter the M.S.E.E. program in the Communications and Signal Processing concentration. It will focus on linear systems theory, to include Fourier series, Fourier and Laplace transforms, transfer functions, frequency response, and convolution. It will also include introductions to the solution of ordinary differential equations and to communications systems. Credit does not apply to the 33 hour M.S.E.E. requirement. Prerequisites: One year of calculus and one semester of probability theory. (3-0) R

EEGR 5365 Engineering Leadership (3 semester hours) Interpersonal influence and organizational

influence in leading engineering organizations. Leadership is addressed from the point of view of the technical manager as well as from that of the technical professional. Topics include staffing, motivation, performance evaluation, communication, project selection and planning, intellectual property and professional ethics. (3-0) R

EEGR 5381 Curriculum Practical Training in Electrical Engineering (3 semester hours) This course is required of students who need additional training in engineering practice. Credit does not apply to the 33 hour M.S.E.E. requirement. Consent of Graduate Adviser required. (May be repeated to a maximum of 9 hours) (3-0) R

EEMF 5383 (PHYS 5383) Plasma Technology (3 semester hours) Hardware oriented study of useful laboratory plasmas. Topics will include vacuum technology, gas kinetic theory, basic plasma theory and an introduction to the uses of plasmas in various industries. (3-0) Y

EECT 5385 Analog Filters (3 semester hours) This course aims at bridging the intermediate-level and the advanced-level knowledge in analog filter design. It moves from basic theory of analog passive filters to theoretical and practical aspects of active, switched-capacitor, and continuous time filters. For active solutions the focus is on integrated implementations on silicon. Prerequisites: EE 3301 and EE 3111. (3-0) Y

EEGR 5V80 Special Topics In Electrical Engineering (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EEMF 6283 (PHYS 6283) Plasma Science Laboratory (2 semester hours) Laboratory will provide a hands on experience to accompany EE 6383. Experiments will include measurements of fundamental plasma properties and understanding of important plasma diagnostics. Co-requisite: EEMF 6383, recommended co-requisite: EEMF 7171. (2-0) T

EEDG 6301 (CE 6301) Advanced Digital Logic (3 semester hours) Modern design techniques for digital logic. Logic synthesis and design methodology. Link between front-end and back-end design flows. Field programmable gate arrays and reconfigurable digital systems. Introduction to testing, simulation, fault diagnosis and design for testability. Prerequisites: EE 3320 or equivalent and background in VHDL/Verilog. (3-0) T

EEDG 6302 (CE 6302) Microprocessor Systems (3 semester hours) Design of microprocessor based systems including I/O and interface devices. Microprocessor architectures. Use of emulators and other sophisticated test equipment. Extensive laboratory work. Prerequisite: EE 4304 or equivalent and background in VHDL/Verilog. (2-3) Y

EEDG 6303 (CE 6303) Testing and Testable Design (3 semester hours) Techniques for detection of failures in digital circuits and systems. Fault modeling and detection. Functional testing and algorithms for automatic test pattern generation (ATPG). Design of easily testable digital systems. Techniques for introducing built-in self test (BIST) capability. Test of various digital modules, such as PLA's, memory circuits, datapath, etc. Prerequisite: EE 3320 or equivalent and background in VHDL/Verilog. (3-0) Y

EEDG 6304 (CE 6304, CS 6304) Computer Architecture (3 semester hours) Trends in processor, memory, I/O and system design. Techniques for quantitative analysis and evaluation of computer systems to understand and compare alternative design choices in system design. Components in high performance processors and computers: pipelining, instruction level parallelism, memory hierarchies, and input/output. Students will undertake a major computing system analysis and design project. Prerequisite: EE 4304 and C/C++. (3-0) Y

EEDG 6305 (CE 6305) Computer Arithmetic (3 semester hours) Carry look ahead systems and carry save adders. Multipliers, multi-bit recoding schemes, array multipliers, redundant binary schemes, residue numbers, slash numbers. High-speed division and square root circuits. Multi-precision algorithms. The IEEE floating point standard, rounding processes, guard bits, error accumulation in arithmetic processes. Cordic algorithms. Prerequisites: EE 3320 and C/C++. (3-0) Y

EEDG 6306 (CE 6306) Application Specific Integrated Circuit Design (3 semester hours) This course discusses the design of application specific integrated circuits (ASIC). Specific topics include: VLSI system design specification, ASIC circuit structures, synthesis, and implementation of an ASIC digital signal processing (DSP) chip. Prerequisites: EE 3320 (3-0) Y

EEDG 6307 (CE 6307) Fault-Tolerant Digital Systems (3 semester hours) Concepts in hardware and software fault tolerance. Topics include fault models, coding in computer systems, fault diagnosis and fault-tolerant routing, clock synchronization, system reconfiguration, etc. Survey of practical fault-tolerant systems. Prerequisite: EE 6301, EE 3341 or equivalent. (3-0) R

EEDG 6308 (CE 6308, CS 6396) Real-Time Systems (3 semester hours) Introduction to real-time

applications and concepts. Real-time operating systems and resource management. Specification and design methods for real-time systems. System performance analysis and optimization techniques. Project to specify, analyze, design, implement and test small real-time system. Prerequisite: CS 5348. (3-0) R

EEOP 6309 (PHYS 5361) Fourier Optics (3 semester hours) Description of coherent optics using a linear systems approach. The concepts of impulse response and transfer functions for unbounded wave propagation, diffraction, and image formation. Introduction to holography and optical data processing. Prerequisites: EE 3302 and EE 4301 or equivalents. (3-0) R

EEOP 6310 Optical Communication Systems (3 semester hours) Operating principles of optical communications systems and fiber optic communication technology. Characteristics of optical fibers, laser diodes, laser modulation, laser and fiber amplifiers, detection, demodulation, dispersion compensation, and network topologies. System topology, star network, bus networks, layered architectures, all-optical networks. Prerequisite: EE 3350 or equivalent. (3-0) T

EERF 6311 RF and Microwave Circuits (3 semester hours) Analysis and design of RF and microwave circuits. Topics include impedance matching, network theory, S-parameters, transmission line media (waveguide, coax, microstrip, stripline, coplanar waveguide, etc.) and passive component design (power dividers, couplers, switches, attenuators, phase shifters, etc.). Industry-standard microwave CAD tools will be used. Prerequisite: EE 4368 or equivalent. (3-0) R

EEOP 6312 Laser and Modern Optics (3 semester hours) Theory and applications of lasers, including ray and beam optics. Design issues include power maximization, noise properties, spectral purity and high-speed modulation. Particular emphasis on semiconductor lasers and their relevance to optical communications. Prerequisite: EE 4301 or equivalent. (3-0) Y

EEOP 6313 Semiconductor Opto-Electronic Devices (3 semester hours) Physical principles of semiconductor optoelectronic devices: optical properties of semiconductors, optical gain and absorption, wave guiding, laser oscillation in semiconductors, LEDs, physics of detectors, applications. Prerequisite: EE 3310 or equivalent. (3-0) T

EEOP 6314 Principles of Fiber and Integrated Optics (3 semester hours) Theory of dielectric waveguides, modes of planar waveguides, strip waveguides, optical fibers, coupled-mode formalism, directional couplers, diffractive elements, switches, wavelength-tunable filters, polarization properties of devices and fibers, step and graded-index fibers, devices for fiber measurements, fiber splices, polarization properties, and fiber systems. Prerequisites: EE 3300 and EE 4301 or equivalents. (3-0) T

EEOP 6315 Engineering Optics (3 semester hours) Fundamental concepts of geometrical optics, first-order optical system design and analysis, paraxial ray tracing, aperture and field stops. Optical materials and properties; third order aberration theory. Prerequisite: PHYS 2326 or equivalent. (3-0) T

EEGR 6316 Fields and Waves (3 semester hours) Study of electromagnetic wave propagation beginning with Maxwell's equations; reflection and refraction at plane boundaries; guided wave propagation; radiation from dipole antennas and arrays; reciprocity theory; basics of transmission line theory and waveguides. Prerequisite: EE 4301 or equivalent. (3-0) Y

EEOP 6317 Physical Optics (3 semester hours) Study of optical phenomena based primarily on the electromagnetic nature of light; mathematical description of polarized light; Jones and Mueller matrices; interference of polarized waves; interferometers, diffractive phenomena based on scalar formalisms; diffraction gratings; and diffraction in optical instruments. Prerequisite: EE 4301 or equivalent. (3-0) T

EEMF 6319 Quantum Physical Electronics (3 semester hours) Quantum-mechanical foundation for study of nanometer-scale electronic devices. Principles of quantum physics, stationary-state eigenfunctions and eigenvalues for one-dimensional potentials, interaction with the electromagnetic field, electronic
conduction in solids, applications of quantum structures. Prerequisite: EE 3300 or equivalent. (3-0) Y

EEMF 6320 (MSEN 6320) Fundamentals of Semiconductor Devices (3 semester hours) Semiconductor material properties, band structure, equilibrium carrier distributions, non-equilibrium current-transport processes, and recombination-generation processes.. Prerequisite: EEMF 6319 or equivalent. (3-0) Y

EEMF 6321 Active Semiconductor Devices (3 semester hours) The physics of operation of active devices will be examined, including p-n junctions, bipolar junction transistors and field-effect transistors: MOSFETs, JFETS, and MESFETS. Active two-terminal devices and optoelectronic devices will be presented. Recommended co-requisite: EEMF 6320. (3-0) Y

EEMF 6322 (MECH 6322, MSEN 6322) Semiconductor Processing Technology (3 semester hours) Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both

silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T

EEMF 6323 Circuit Modeling of Solid-State Devices (3 semester hours) Provide physical insight into the operation of MOSFETs and BJTs, with particular emphasis on new physical effects in advanced devices. Compact (SPICE-level) transistor models will be derived from basic semiconductor physics; common simplifications made in the derivations of model equations will be detailed to provide an appreciation for the limits of model capabilities. Prerequisites: EEMF 6320 and EEMF 6321. (3-0) R

EEMF 6324 (MSEN 6324) Electronic, Optical and Magnetic Materials (3 semester hours) Foundations of materials properties for electronic, optical and magnetic applications. Electrical and Thermal Conduction, Elementary Quantum Physics, Modern Theory of Solids, Semiconductors and Devices, Dielectrics, Magnetic and Optical Materials properties. Prerequisite: MSEN 5300or equivalent. (3-0) T

EECT 6325 (CE 6325) VLSI Design (3 semester hours) Introduction to MOS transistors. Analysis of the CMOS inverter. Combinational and sequential design techniques in VLSI; issues in static, transmission gate and dynamic logic design. Design and layout of complex gates, latches and flip-flops, arithmetic circuits, memory structures. Low power digital design. The method of logical effort. CMOS technology.. Use of CAD tools to design, layout, check, extract and simulate a small project. Prerequisites: EE 3320, EE 3301 or equivalent. (3-0) Y

EECT 6326 Analog Integrated Circuit Design (3 semester hours) Introduction to MOS transistor, CMOS technology and analog circuit modeling. Basic analog circuits: MOS switches, active resistors, current sources, current mirrors, current amplifiers, inverting amplifier, differential amplifier, cascade amplifier and the output amplifier. Complex circuits: comparators and operational amplifiers. Use of CAD tools to layout and simulate analog circuits. Prerequisite: EE 4340 (3-0) Y

EEOP 6328 Nonlinear Optics (3 semester hours) Survey of nonlinear optical effects; origins of optical nonlinearities; laser-pulse propagation equations in bulk media and optical fibers; the nonlinear optical susceptibility tensor; second-order nonlinear optical effects (second harmonic generation, optical rectification, parametric mixing and amplification); third-order nonlinear optical effects in fiber optic communication systems (self-phase modulation, cross-phase modulation, stimulated Brillouin scattering, stimulated Raman scattering, four-wave mixing, nonlinear polarization mode dispersion); self-focusing and self-defocusing in bulk media; computational methods for nonlinear optics. Prerequisite: EE 4301 or equivalent; EEOP 6310 recommended. (3-0) R

EEOP 6329 Optical Signal Conditioning (3 semester hours) Engineering principles and applications of laser beam modulation and deflection (acousto-optics and electro-optics), harmonic generation and optical parametric processes, optical pulse compression and shaping. Prerequisites: EE 4301 or equivalent and EEOP 6317 recommended. (3-0) R

EERF 6330 RF Integrated Circuit Design (3 semester hours) Introduction to RF and Wireless systems; Basic Concepts of RF Design: Linearity, Distortion, (P1dB, IIP3), Sensitivity, Noise Figure; RF Passives: Q-factors, Impedance Transformation, Matching Network; Transceiver Architectures: Receivers – Heterodyne, Direct downconversion, Image Reject Receivers, Direct conversion transmitter, two-step transmitter; Low Noise Amplifier Design; Mixer Design; Oscillator Design; Basic architectures of Power Amplifiers. Use of Agilent ADS for Design Projects. Prerequisite EE 4340. (3-0). Y

EESC 6331 Linear Systems and Signals (3 semester hours) Systems and control theory: state space, convolution integrals, transfer functions, stability, controllability, observability, and feedback. Prerequisites: EE 2300 and EE 4310. (3-0) Y

EEGR 6332 (MECH 6332) Advanced Control (3 semester hours) Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: EESC 6331. (3-0) R

EEOP 6334 Advanced Geometrical and Physical Optics (3 semester hours) Geometrical optics as a limiting case of the propagation of electromagnetic waves; geometrical theory of optical aberrations; the diffraction theory of aberrations; image formation with partially coherent and partially polarized light; computational methods for physical optics. Other topics may be selected from the following: diffraction theory of vector electromagnetic fields, diffraction of light by ultrasonic waves, optics of metals, Lorenz-Mie theory of the scattering of light by small particles, and optics of crystals. Prerequisite: EEOP 6317. (3-0) R

EEOP 6335 Engineering of Infrared Imaging Systems (3 semester hours) Thermal optics, review of Fourier optics, review of information theory, embedded system design principles, and system modeling.

Prerequisites: EEOP 6309 or 6315 or equivalents. (3-0) T

EEGR 6336 (MECH 6336) Nonlinear Control Systems (3 semester hours) Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: EESC 6331. (3-0) R

EEOP 6338 High-Speed Optical Receivers and Transmitters (3 semester hours) Review of optical communication systems. Definitions of attenuation and dispersion. Architecture of optical transmitters and receivers. Principles of operation of photodetectors (PIN and APD). Application of digital communication theory to the analysis of optical receivers. Definition of sensitivity and dynamic range in optical receivers. Study of high-speed transimpedance and limiting amplifiers. Principles of operation of lasers (DFB and Fabry-Perot). Study of tunable lasers and high-speed external modulators. Direct and externally modulated transmitters. Study of high-speed drivers for laser and modulators. Characteristics of optical transmitters. Prerequisite: EE 3311 or equivalent. (3-0) R

EESC 6340 Introduction to Telecommunications Networks (3 semester hours) Circuit, message and packet switching. The hierarchy of the ISO-OSI Layers. The physical layer: channel characteristics, coding, and error detection. The data link control layer: retransmission strategies, framing, multiaccess protocols, e.g., Aloha, slotted Aloha, CSMA, and CSMA/CD. The network layer: routing, broadcasting, multicasting, flow control schemes. Co-requisite: EESC 6349. (3-0) Y

EESC 6341 Information Theory I (3 semester hours) Self information, mutual information, discrete memoryless sources, entropy, source coding for discrete memoryless channels, homogeneous Markov sources, discrete memoryless channels, channel capacity, converse to the coding theorem, noisy channel coding theorem, random coding exponent, Shannon limit. Prerequisite: EESC 6352. (3-0) R

EESC 6343 Detection and Estimation Theory (3 semester hours) Parameter estimation. Least-square, mean-square, and minimum-variance estimators. Maximum A Posteriori (MAP) and Maximum-Likelihood (ML) estimators. Bayes estimation. Cramer-Rao lower bound. BLUE estimator and Wiener filtering. Prerequisite: EESC 6349. (3-0) R

EESC 6344 Coding Theory (3 semester hours) Groups, fields, construction and properties of Galois fields, error detection and correction, Hamming distance, linear block codes, syndrome decoding of linear block codes, cyclic codes, BCH codes, error trapping decoding and majority logic decoding of cyclic codes, non-binary codes, Reed Solomon codes, burst error correcting codes, convolutional codes, Viterbi decoding of convolutional codes. Prerequisite: EESC 6352. (3-0) R

EEDG 6345 (CE 6345) Engineering of Packet-Switched Networks (3 semester hours) Detailed coverage, from the point of view of engineering design, of the physical, data-link, network and transport layers of IP (Internet Protocol) networks. This course is a masters-level introduction to packet networks. Prior knowledge of digital communication systems is strongly recommended. Prerequisite: EE 3350 or equivalent. (3-0) Y

EEMF 6348 (MSEN 6348) Lithography and Nanofabrication (*3 semester hours*) Study of the principles, practical considerations, and instrumentation of major lithography technologies for nanofabrication of devices and materials. Advanced photolithography, electron beam lithography, nanoimprint lithography, x-ray lithography, ion beam lithography, soft lithography, and scanning probe lithography, basic resist and polymer science, applications in nanoelectronics and biomaterials. (3-0) Y

EESC 6349 Random Processes (3 semester hours) Random processes concept. Stationarity and independence. Auto-correlation and cross-correlation functions, spectral characteristics. Linear systems with random inputs. Special topics and applications. Prerequisite: EE 3302 and EE 3341 or equivalent. (3-0) Y

EESC 6350 Signal Theory (3 semester hours) Signal processing applications and signal spaces, vector spaces, matrix inverses and orthogonal projections, four fundamental subspaces, least squares and minimum norm solutions, the SVD and principal component analysis, subspace approximation, infinite dimensional spaces, linear operators, norms, inner products and Hilbert spaces, projection theorems, spectral properties of Hermitian operators, Hilbert spaces of random variables, linear minimum variance estimation and the Levinson-Durbin algorithm, general optimization over Hilbert spaces, methods and applications of optimization. Prerequisite: EE 3302 or equivalent. (3-0) Y

EERF 6351 Computational Electromagnetics (3 semester hours) Review of Maxwell's equations; numerical propagation of scalar waves; finite-difference time-domain solutions of Maxwell's equations; numerical implementations of boundary conditions; numerical stability; numerical dispersion; absorbing boundary conditions for free space and waveguides; selected applications in telecommunications, antennas, microelectronics and digital systems. Prerequisite: EE 4301 or equivalent. (3-0) R

EESC 6352 Digital Communication Systems (3 semester hours) Digital communication systems are discussed. Source coding and channel coding techniques are introduced. Signaling schemes and performance of binary and M-ary modulated digital communication systems. The overall design considerations and performance evaluations of various digital communications systems are emphasized. Prerequisite: EESC 6349 or equivalent. (3-0) Y

EESC 6353 Broadband Digital Communication (3 semester hours) Characterization of broadband wireline and wireless channels. MAP and ML detection. Intersymbol Interference (ISI) effects. Equalization methods to mitigate ISI including single-carrier and multi-carrier techniques. Equalization techniques and structures including linear, decision-feedback, precoding, zero forcing, mean square-error, FIR versus IIR. Multi-Input Multi-Output (MIMO) Equalization. Implementation issues including complexity, channel estimation, error propagation, etc. Real-world case studies from Digital Subscriber Lines (DSL) and wireless systems. Students work individually or in small teams on project and present their findings to class. Prerequisite: EE 4360 and knowledge of MATLAB. (3-0) T

EERF 6355 RF and Microwave Amplifier Design (3 semester hours) Design of high-frequency active circuits. Review of transmission line theory. RF and microwave matching circuits using discrete and guided wave structures. Detailed study of S-parameters. Design of narrow band, broadband and low noise amplifiers. Detailed study of noise figure, noise parameters and stability of RF and microwave circuits using S-parameters. Prerequisite: EE 4368 or equivalent. (3-0) R

EESC 6360 Digital Signal Processing I (3 semester hours) Analysis of discrete time signals and systems, Z-transform, discrete Fourier transform, fast Fourier transform, analysis and design of digital filters. Prerequisite: EE 3302 or EE 4361 or equivalent. (3-0) Y

EESC 6361 Digital Signal Processing II (3 semester hours) Continuation of EE 6360. Includes advanced topics in signal processing such as: Digital filter structures and finite-word-length effects, digital filter design and implementation methods, multirate digital signal processing, linear prediction and optimum filtering, spectral analysis and estimation methods. Prerequisite: EESC 6360. (3-0) T

EESC 6362 Introduction to Speech Processing (3 semester hours) Introduction to the fundamentals of speech signal processing and speech applications. Speech analysis and speech synthesis techniques, speech enhancement and speech coding techniques including ADPCM and linear-predictive based methods such as CELP. Prerequisite: EESC 6360. (3-0) Y

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EESC 6363 Digital Image Processing (3 semester hours) Image formation, image sampling, 2D Fourier transform and properties, image wavelet transform, image enhancement in spatial and frequency domains, image restoration, color image processing, image segmentation, edge detection, morphological operations, object representation and description, introduction to image compression. Prerequisites: EE 4361 or equivalent and knowledge of C or MATLAB. (3-0) T

EESC 6364 Pattern Recognition (3 semester hours) Pattern recognition system, Bayes decision theory, maximum likelihood and Bayesian parametric classifiers, linear discriminant functions and decision boundaries, density estimation and nonparametric classifiers, unsupervised classification and clustering, multilayer neural networks, decision trees, classifier comparison. Prerequisite: Knowledge of C or MATLAB. Co-requisite: EESC 6349. (3-0) T

EESC 6365 Adaptive Signal Processing (3 semester hours) Adaptive signal processing algorithms learn the properties of their environments. Transversal and lattice versions of the Least Mean Squares (LMS) and Recursive Least Squares (RLS) adaptive filter algorithms and other modern algorithms will be studied. These algorithms will be applied to network and acoustic echo cancellations, speech enhancement, channel equalization, interference rejection, beam forming, direction finding, active noise control, wireless systems, and others. Prerequisites: EESC 6349, EESC 6360 and knowledge of matrix algebra. (3-0) T

EESC 6366 Speech and Speaker Recognition (3 semester hours) Introduction to concepts in automatic recognition methods for speech applications; the primary emphasis is for automatic speech recognition and speaker identification techniques. Topics include speech features for recognition, hidden Markov models for acoustic and language applications, Gaussian mixture models for speaker characterization, robustness issues to address noise and channel conditions for automatic recognition. Co-requisite: EESC 6349. (3-0) Y

EESC 6367 Applied Digital Signal Processing (3 semester hours) Implementation of signal processing algorithms, combination of textual and graphical programming of DSP systems, fixed-point versus floating-point, FPGA/DSP chip architecture, FPGA/DSP software development tools, code optimization, application project. Prerequisites: EE 4361 or equivalent and knowledge of C or MATLAB. (2-3) Y

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EEDG 6370 (CE 6370) Design and Analysis of Reconfigurable Systems (3 semester hours) Introduction to reconfigurable computing, programmable logic: FPGAS, CPLDs, CAD issues with FPGA based design, reconfigurable systems: emulation, custom computing, and embedded application based computing, static and dynamic hardware, evolutionary design, software environments for reconfigurable systems. Prerequisite: EE 3320 or equivalent. (3-0) R

EEMF 6372 Semiconductor Process Integration (3 semester hours) The integration of semiconductor processing technology to yield integrated circuits. The course will emphasize MOSFET design based upon process integration, in particular as it applies to short channel devices of current interest. Process simulation will be used to study diffusion, oxidation, and ion implantation. (3-0) R

EEBM 6373 Anatomy and Human Physiology for Engineers (3 semester hours) This course provides an introduction to anatomy and human physiology for engineers and other non-life-scientists. Topics include nervous system, muscle and cardiac function, digestive system, immune system. (3-0) Y

EEBM 6374 Genes, Proteins and Cell Biology for Engineers (3 semester hours) This course provides an introduction to principles of modern molecular and cellular biology for engineers and other non-life-scientists. Topics include genes, protein structure and function, organization of cells and cellular trafficking. (3-0) Y

EEDG 6375 (CE 6375) Design Automation of VLSI Systems (3 semester hours) This course deals with various topics related to the development of CAD tools for VLSI systems design. Algorithms, data structures, heuristics and design methodologies behind CAD tools. Design and analysis of algorithms for layout, circuit partitioning, placement, routing, chip floor planning, and design rule checking (DRC). Introduction to CAD algorithms for RTL and behavior level synthesis, module generators, and silicon compilation. Prerequisite: CS 5343. Co-requisite: EECT 6325. (3-0) Y

EEBM 6376 Lecture Course in Biomedical Applications of Electrical Engineering (3 semester hours) This course provides an introduction to different areas of biomedical applications of electrical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y

EECT 6378 Power Management Circuits (3 semester hours): Operating principles of rectifiers and different dc-dc converters: switched-mode power converters, charge pumps and linear regulators. Design and analysis of voltage references and frequency compensation techniques for two-stage and three-stage amplifiers. Use of CAD tools to simulate power management circuits. Prerequisite: EECT 6326 or equivalent (3-0) Y

EEGR 6381 (MECH 6381) Numerical Methods In Engineering (3 semester hours) Numerical techniques in engineering and their applications, with an emphasis on practical implementation. Topics will include some or all of the following: numerical methods of linear algebra, interpolation, solution of nonlinear equations, numerical integration, Monte Carlo methods, numerical solution of ordinary and partial differential equations, and numerical solution of integral equations. Prerequisites: CE/EE/MECH 2300 and CE/EE/MECH 3300 or equivalents, and knowledge of a scientific programming language. (3-0) T

EEMF 6382 (MECH 6382) Introduction to MEMS (3 semester hours) Study of micro-electro-mechanical devices and systems and their applications. Microfabrication techniques and other emerging fabrication processes for MEMS are studied along with their process physics. Principles of operations of various MEMS devices such as mechanical, optical, thermal, magnetic, chemical/biological sensors/actuators are studied. Topics include: bulk/surface micromachining, LIGA, microsensors and microactuators in multi-physics domain. (3-0) T

EEMF 6383 (PHYS 6383) Plasma Science (3 semester hours) Theoretically oriented study of plasmas. Topics to include: fundamental properties of plasmas, fundamental equations (kinetic and fluid theory, electromagnetic waves, plasma waves, plasma sheaths) plasma chemistry and plasma diagnostics. Prerequisite: EEMF 6316 or equivalent. (3-0) T

EESC 6390 Introduction to Wireless Communication Systems (3 semester hours) Principles, practice, and system overview of mobile systems. Modulation, demodulation, coding, encoding, and multiple-access techniques. Performance characterization of mobile systems. Prerequisite: EE 3350 or equivalent. (3-0) Y

EESC 6391 Signaling and Coding for Wireless Communication Systems (3 semester hours) Study of signaling and coding for wireless communication systems. Topics which will be covered include digital modulation schemes, digital multiple access technologies, their performance under wireless channel impairments, equalization, channel coding, interleaving, and diversity schemes. Prerequisites: EESC

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Deleted: 6376 Lecture Course in Biomedical Applications of Electrical Engineering (3 semester hours) This course provides an introduction to different areas of biomedical applications of electrical engineering. A special emphasis will be placed on research topics that are actively pursued at UTD. (3-0) Y

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Item 12DD

6352 and EESC 6390. (3-0) T

EESC 6392 Propagation and Devices for Wireless Communications (3 semester hours) Mobile communication fundamentals, models of wave propagation, simulation of electromagnetic waves in the cellular environment, multipath propagation, compensation for fading, mobile and cell antenna designs, problems of interference and incompatibility, design of active and passive cellular components, comparison of analog and digital cellular designs. Prerequisites: EE 4301 or equivalent; EESC 6390. (3-0) R

EESC 6393 Imaging Radar Systems Design and Analysis (3 semester hours) Radar systems, antenna systems, the radar equation, electromagnetic waves scattering from targets, radar signal and noise, detection and extraction of signal from noise or clutter, range and Doppler profiles, radar image formation, real aperture radar imaging, SAR imaging, ISAR imaging, image distortion, super resolution radar imaging techniques, and advanced holographic radar imaging techniques. Prerequisites: EE 3350 and EE 4301 or equivalents. (3-0) T

EERF 6394 Antenna Engineering and Wave Propagation (3 semester hours) Operating principles for microwave antennas used in modern wireless communications and radar systems. Prerequisite: EE 6316 or equivalent. (3-0) T

EERF 6395 Radiofrequency and Microwave Systems Engineering (3 semester hours) Review of RF and microwave systems, such as cellular, point-to-point radio, satellite, RFID and RADAR. Topics include: system architectures, noise & distortion, antennas & propagation, transmission lines & network analysis, active & passive components, modulation techniques and specification flowdown. Prerequisite: EE 4368 or equivalent. (3-0) R

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EERF 6396 Microwave Design and Measurement (3 semester hours) This lecture and lab course covers the fundamentals of microwave component design and measurements, including vector impedance (scattering parameters), scalar measurements and spectrum analysis. Microwave components, such as filters, directional couplers, switches, amplifiers, and oscillators, will be designed and simulated with various CAD tools and then built and measured to compare performance with theory. Prerequisite: EE 4368 or equivalent. (2-1) R

EEDG 6398 (CE 6398, CS 6398) DSP Architectures (3 semester hours) Typical DSP algorithms, representation of DSP algorithms, data-graph, FIR filters, convolutions, Fast Fourier Transform, Discrete Cosine Transform, low power design, VLSI implementation of DSP algorithms, implementation of DSP algorithms on DSP processors, DSP applications including wireless communication and multimedia. Prerequisite: CS 5343. (3-0) Y

EEGR 6V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

EEMF 7171 Current Topics in Plasma Processing (1 semester hour) Discussion of current literature on plasma processing; applications, diagnostics, sources, chemistry and technology. May be repeated for credit. Prerequisite: Knowledge of plasma processing technology (EEMF 5383 or EEMF 6383 preferred) or consent of instructor. (1-0) Y

EEDG 7304 (CE 7304) Advanced Computer Architecture (3 semester hours) Advanced research topics in multi-processor, network and reconfigurable architectures. Focuses on current research in the area of computer system architecture to prepare students for a career in computer architecture research. Course will use articles from current technical literature to discuss relevant topics, such as digital signal processors and VLIW processors. Prerequisites: EEDG 6304, CS 5348, EE 3341 and knowledge of C/C++. (3-0) R

EEMF 7320 (MSEN 7320) Advanced Semiconductor Device Theory (3 semester hours) Quantum mechanical description of fundamental semiconductor devices; carrier transport on the submicron scale; heterostructure devices; quantum-effect devices. Prerequisites: EEMF 6320 and EEMF 6321. (3-0) R

EECT 7325 (CE 7325) Advanced VLSI Design (3 semester hours) Advanced topics in VLSI design covering topics beyond the first course (EE 6325). Topics include: use of high-level design, synthesis, and simulation tools, clock distribution and routing problems, (a)synchronous circuits, low-power design techniques, study of various VLSI-based computations, systolic arrays, etc. Discussions on current research topics in VLSI design. Prerequisite: EECT 6325 or equivalent. (3-0) R

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EECT 7326 Analog Integrated Systems Design (3 semester hours) Introduction to the types of systems environment in which analog integrated circuit design is employed. The topics are A/D and D/A converters, including over-sampled S-D A/D converters, switched capacitor amplifiers, multipliers, wave-shaping circuits, oscillators, PLLs, and the design of filters. Prerequisite: EECT 6326 (3-0) Y

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EECT 7327 Analog to Digital and Digital to Analog Converters (3 semester hours) This course provides the basic and the specific knowledge for the design and the use of data converters. Topics include fundamentals on sampling and quantization, Nyquist-rate and oversampled techniques, circuit design issues, testing, digital calibration and correction. Prerequisite: EECT 6326 and EECT 6325. (3-0) Y

EEDG 7328 (CE 7328) Physical Design of High-Speed VLSI Circuits (3 semester hours) Techniques for the physical design of high-speed VLSI circuits. Topics related to interconnection circuit modeling, performance-driven routing, buffer and wire sizing, placement and floor planning, technology mapping and performance evaluation issues encountered in high-speed VLSI circuit designs. Discussion of state-of-the-art practical industrial design examples. A project related to the development of a prototype CAD tool. Prerequisites: EECT 6325 and knowledge of programming in C. (3-0) T

EECT 7329 Advanced Analog Integrated Circuit Design (3 semester hours) The course will cover, but not be limited to, advanced architectures for voltage references, current references, operational amplifiers (including voltage, current, transconductance, and transresistance), comparators, linear regulators, etc. Emphasis will be on why one topology might be better than another for a given set of specifications or applications. Prerequisite: EECT 6326 (3-0) T

EERF 7330 Advanced RF Integrated Circuit Design (3 semester hours) Power Amplifiers, different classes of linear (A, B, AB, C) and switching power amplifiers (E, G, H), CMOS Integrated power amplifiers, High Efficiency Power Amplifiers (Doherty Power Amplifier); Phase Locked Loops: Basic concepts of PLL, Charge pumps, Type-I and Type-II PLLs, Noise in PLLs, Phase Noise, Frequency multiplication, RF Synthesizer Architectures, Frequency Dividers, Fractional-N PLLs, Delta-Sigma based PLLs, ADPLL; Advanced RF transceivers; Wideband and multiband radio design; Complete link budget analysis for wireless systems. Design project will focus on design of the entire transmitter using Agilent ADS. Prerequisite: RF Integrated Circuit Design. (3-0) Y

EECT 7331 Physics of Noise (3 semester hours) The physics of fluctuation phenomena, generically called Noise. The class will cover the fundamental physical principles underlying generation-recombination, thermal, shot, 1/f noise and other, related fluctuation phenomena. The statistical nature of these physical processes will be developed. The physics of noise in resistors, diodes, bipolar, JFETS, and MOSFETs will be discussed and how to model it in circuits. Approximately two thirds of the class will be devoted to the physics of noise and the rest will cover how to use this knowledge to design low-noise integrated circuits. Prerequisite: EECT 6326. Y

EEOP 7340 Optical Network Architectures and Protocols (3 semester hours) Introduction to optical networks. The ITU Optical Layer. First-generation optical networks. Standards, e.g. SONET/SDH, FDDI. Second-generation optical networks. Broadcast and select networks. The lightpath concept. Wavelength routing networks. Virtual topology design. Photonic packet switching. Advanced solutions and test beds. Prerequisite: EEOP 6340 (3-0) R

EEDG 7V81 Special Topics In Digital Systems (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EEMF 7V82 Special Topics In Microelectronics (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EEOP 7V83 Special Topics in Optics and Fields (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EESC 7V84 Special Topics in Telecommunications (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) R

EESC 7V85 Special Topics in Signal Processing (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EESC 7V86 Special Topics in Wireless Communications (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EEBM 7V87 Special Topics in Biomedical Applications of Electrical Engineering (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EECT 7V88 Special Topics in Circuits and Systems (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

EEGR 8V40 Individual Instruction in Electrical Engineering (1-6 semester hours) (May be repeated for credit.) For pass/fail credit only. ([1-6]-0) R

EEGR 8V70 Research In Electrical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

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EEGR 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

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Graduate Program in Emerging Media and Communication

Master of Arts

The program leading to the M.A. in Emerging Media and Communication focuses on ways in which network technologies are transforming the creation and dissemination of information and content. Providing an interdisciplinary education that connects theory with practice, the program combines the creation of digital content for multiple communication platforms with examination of cultural issues created by emerging technology. The program is intended for (a) professionals in fields such as journalism, design, public relations, and advertising that are powerfully affected by emerging communicative technologies, (b) graduates with degrees in computer science or related fields who wish to expand their occupational potential by gaining expertise in communication, (c) graduates of programs in the humanities, communication, and journalism who wish to expand their occupational potential by gaining expertise in emerging media, and (d) teachers in the humanities and other fields that will be profoundly affected by new modes of communication and information transfer. Students must complete 33 semester credit hours of course work and a capstone project.

Core Course (3 hours)

EMAC 6300 Introduction to the Study of Emerging Media and Communication

Required Courses (15 hours)

EMAC 6361 Writing for Interactive Media
EMAC 6372 Approaches to Emerging Media and Communication
EMAC 6373 Emerging Media Studio
EMAC 6374 Digital Textuality
HUHI 6323 Space, Time, and Culture
or
HUSL 6355 Literature, Science, and Culture

Prescribed Electives (12 hours)

Twelve hours chosen from the following courses:

ATEC 6331 Aesthetics of Interactive Media
EMAC 6371 Community Media
EMAC 6383 Emerging Media Studio II
EMAC 6V81 Special Topics in Emerging Media and Communication HUAS 6330 Studies in the Visual Arts
HUAS 6381 Image/Text Workshop
HUAS 6355 Creating Nonfictions
HUHI 6323 Space, Time, and Culture
HUSL 6355 Literature, Science, and Culture
HUSL 6380 Art & Craft of Translation

Final Project (3 hours)

EMAC 6V91 Advanced Project Workshop

Having completed at least 30 hours of course work, students will complete and present an advanced multi-media project for evaluation by a master's committee.

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Item #12EE

Department of Materials Science and Engineering

http://www.mse.utdallas.edu/index.html

Faculty

Professors: Yves Chabal, Bruce E. Gnade, Moon J. Kim, Robert M. Wallace
Associate Professors: Amy Walker, Jiyoung Kim
Assistant Professors: Christopher Hinkle
Affiliated Faculty: Kenneth J. Balkus (Chemistry), Ray H. Baughman (Chemistry), Cyrus D. Cantrell (Electrical Engineering), Kyeongjae Cho (Physics), Santosh R. D'Mello (Biology), Rockford K. Draper (Biology), John P. Ferraris (Chemistry), Yuri Gartstein (Physics), Robert Glosser (Physics), Juan E. González (Biology), Steven R. Goodman (Biology), Wenchuang Hu (Electrical Engineering), Gil S. Lee (Electrical Engineering), Jeong-Bong Lee (Electrical Engineering), Sanjeev K. Manohar (Chemistry), Inga Holl Musselman (Chemistry), Lawrence J. Overzet (Electrical Engineering), Eric Vogel (Electrical Engineering), Anvar A. Zakhidov (Physics)
Adjunct Faculty: H. Edwards (Texas Instruments), E. Forsythe (Army Research Laboratory), R. Irwin (Texas Instruments), M. Quevedo-Lopez

Objectives

The program leading to the M.S. degree in materials science and engineering provides intensive preparation for professional practice in modern materials science by those engineers who wish to continue their education. Courses are offered at a time and location convenient for the student who is employed on a full-time basis.

The objective of the doctoral program in materials science and engineering is to prepare individuals to perform original, cutting edge research in the broad areas of materials science, including areas such as nano-structured materials, electronic, optical and magnetic materials, bio-mimetic materials, polymeric materials, MEMS materials and systems, organic electronics, and advanced processing of modern materials.

Objectives

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Advanced Electron Microscopy Laboratory

Focused Ion Beam /Scanning Electron Microscopy

The focused ion beam system is a FEI Nova 200 NanoLab which is a dual column SEM/FIB. It combines ultra-high resolution field emission scanning electron microscopy (SEM) and focused ion beam (FIB) etch and deposition for nanoscale prototyping, machining, 2-D and 3-D characterization, and analysis. Five

gas injection systems are available for deposition (e.g. Pt, C, SiO_2) and etching (e.g. Iodine for metals, and a dielectric etch). Nanoscale chemical analysis is done with energy dispersive X-ray spectroscopy (EDS). A high resolution digital patterning system controlled from the User Interface is also available. Predefined device structures in Bitmap format can be directly imported to the patterning system for nanoscale fabrication. The FEI Nova 200 is also equipped with a Zyvex F100 nano-manipulation stage, which includes four manipulators with 10 nm positioning resolution. The four manipulators can be fitted with either sharp whisker probes for electrically probing samples or microgrippers for manipulating nanostructures as small as 10 nanometers. This is the first instrument of its kind in the world that combines a dual beam FIB with the F100 nanomanipulator, providing unparalleled nanofabrication and nanomanipulation.

High-Resolution Transmission Electron Microcopy

The facility operates and maintains two state-of-the-art transmission electron microscopes (TEM), and a host of sample preparation equipments. It also provides microscopy computing and visualization capabilities. Techniques and equipment available includes the following: (i) *High Resolution Structural Analysis* - The high-resolution imaging TEM is a JEOL 2100 F which is a 200kV field emission TEM. Its capability includes atomic scale structural imaging with a resolution of better than 0.19 nm, and in-situ STM/TEM. (ii) *High Resolution Chemical and Electronic Structure Analysis* **-** High resolution analytical TEM is a second JEOL 2100F field emission TEM/STEM equipped with an energy dispersive x-ray spectrometer (EDS), an electron energy loss spectrometer (EELS), and a high angle Z-contrast imaging detector. This instrument performs chemical and electronic structure analysis with a spatial resolution of better than 0.5 nm in EELS mode and is also capable of spectrum imaging and mapping. The image resolution in the chemically sensitive Z-contrast scanning TEM (STEM) mode will be about 0.14 nm. Its capability also includes in-situ cryogenic cooling and heating, and a computer control system for remote microscopy operation.

X-ray Diffraction Suite

A Rigaku Ultima III X-ray Diffractometer system is available for thin film diffraction characterization. The system is equipped with a cross beam optics system to permit either High-resolution parallel beam with a motor controlled multilayer mirror, or a Bragg-Brentano Para-Focusing beam (without the multilayer mirror) which are permanently mounted, pre-aligned and user selectable with no need for any interchange between components. Curved graphite crystal or Ge monochrometers are also available. An integrated annealing attachment permits the *in-situ* examination of film structure up to 1500°C. The instrument enables a variety of applications including in-plane and normal geometry phase identification, quantitative analysis, lattice parameter refinement, crystallite size, structure refinement, residual stress, density, roughness (from reflectivity geometries), and depth-controlled phase identification. Detection consists of a computer controlled scintillation counter. Sample sizes up to 100 mm in diameter can be accommodated on this system. A new Rigaku Rapid Image Plate Diffractometer system is also available for small spot (30mm - 300mm) XRD work. The digital image plate system enables the acquisition of diffraction data over a 204° angle with a rapid laser scanning readout system.An integrated annealing attachment permits the *in-situ* examination of film structure up to 900C on this system. A complete set of new control, database and analysis workstations and software is associated with these new systems.

Wafer Bonding Laboratory

An UHV wafer bonding unit, especially designed to use surface characterization and thin-film deposition techniques to measure and control substrate and interface chemistry within limits necessary to make heterojunction devices, is available to produce integrated heterostructures with well controlled chemistry that are tractable for quantitative nanostructural and properties measurements. This unit is capable of synthesizing interfaces by direct wafer bonding and/or in-situ thin film deposition method, and offers greater flexibility for producing advanced integrated artificial structures. It consists of five interconnected ultra high vacuum (UHV) chambers for in-situ surface preparation and analysis, addition of interface

interlayers by e-beam or UHV sputter deposition, a bonding chamber, and a sample entry and preparation chamber. The base pressure is $2x10^{-10}$ Torr. Orientation of the bonded pairs can be controlled to ~ 0.1 degree prior to bonding. Ex-situ surface preparations using etching and low energy reactive plasma cleaning is done in a cleanroom to protect substrates prior to insertion in the bonding instrument. An atomic force microscopy (AFM) is also available to provide direct measurements of these effects, to supplement the indirect information of RHEED.

Computational Materials Science Laboratory

Materials modeling software tools and hardware facilities are available for nanoscale materials research. Atomistic modeling software tools are used for structure and dynamic analysis of diverse material systems at nanoscales, and the examples include nanoelectronic materials and nanomaterials for renewable energy applications. For quantum mechanical analysis of materials, density functional theory (DFT) software tools (VASP, ABINIT, PWSCF, and SIESTA) are used on local parallel computing cluster. In-house quantum transport modeling software tool is used for I-V calculation of nanoelectronic devices using the non-equilibrium Green's function (NEGF) method. These software and hardware tools are also used for class projects of MSEN 5377.

Cleanroom Research Laboratory

The new cleanroom facility located in the Natural Science and Engineering Research Laboratory (http://www.utdallas.edu/eecs/cleanroom/) is utilized for materials and device research. The facility has 5,000 sq. ft. of class 10,000 space. This facility contains semiconductor processing equipment including optical and e-beam lithography, chemical processing hoods, evaporation and sputter deposition systems, as well as a wide variety of material and processing diagnostics.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to U.T. Dallas graduate engineering students.

Master of Science in Materials Science and Engineering

Admission Requirements

The University's general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in Materials Science and Engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the MSEN program should meet the following guidelines:

- Student has met standards equivalent to those currently required for admission to the Ph.D. or Master's degree programs in Electrical Engineering, Chemistry, Physics, or Biology.
- a grade-point average in graduate-level course work of 3.5 or better on a 4-point scale
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Students who fulfill some of the above requirements, if admitted conditionally, will be required to take graduate level courses as needed to make up any deficiencies.

Degree Requirements

The University's general degree requirements are discussed here.

The MSEN M.S. degree requires a minimum of 33 semester hours.

All students must have an academic advisor and an approved degree plan. These are based upon the student's choice of concentration. Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of the approved course of studies leads to the M.S. degree.

M. S. students undertaking the thesis option must carry out a research project under the direction of a member of the Materials Science and Engineering Affiliated Faculty and complete and defend a thesis on the research project. A Supervisory Committee will be appointed once the faculty member accepts the student for a research project. The rules for the thesis defense are specified by the Office of the Dean of Graduate Studies.

For each of the proposed degree programs, students must pass the following core courses with a grade of B or better:

Note: the presence of a course number in parentheses indicates that this course will be cross-listed with an existing course.

- MSEN 5310 Thermodynamics of Materials
- MSEN 5360 Materials Characterization
- MSEN 6324 (EE 6324) Electronic, Optical and Magnetic Materials
- MSEN 6319 Quantum Mechanics for Materials Scientists

A student may petition for waiver of core courses, and if the Materials Science and Engineering Affiliated Faculty, or a designated committee, finds that the student has mastered the course material, the student may replace that core course with an elective course for a total of twelve semester credit hours.

A minimum of 9 semester credit hours will be required from the Advanced Course List

- MSEN 5340 Advanced Polymer Science and Engineering
- MSEN 5370 Ceramics and Metals
- MSEN (5377) (PHYS 5377) Computational Physics of Nanomaterials
- MSEN 6310 Mechanical Properties of Materials
- MSEN 6330 Phase Transformations
- MSEN 6350 Imperfections in Solids
- MSEN 6377 (PHYS 6377) Physics of Nanostructures: Carbon Nanotubes, Fullerenes, Quantum Wells, Dots and Wires

The remaining credit hours are to be taken from the following list of Specialized Courses (or approved electives from Physics, Chemistry, or Biology):

- MSEN 5300 Introduction to Materials Science
- MSEN 5331 (CHEM 5331) Advanced Organic Chemistry I
- MSEN 5333 (CHEM 5333) Advanced Organic Chemistry II
- MSEN 5341 (CHEM 5341) Advanced Inorganic Chemistry
- MSEN 5344 Thermal Analysis
- MSEN 5353 Integrated Circuit Packaging

- MSEN 5355 (CHEM 5355) Analytical Techniques I
- MSEN 5356 (CHEM 5356) Analytical Techniques II
- MSEN 5361 Fundamentals of Surface and Thin Film Analysis
- MSEN 5371 (PHYS 5371) Solid State Physics
- MSEN 5375 (PHYS 5375) Electronic Devices Based On Organic Solids
- MSEN 5383 (PHYS 5383 and EE 5383) Plasma Technology
- MSEN 5410 (BIOL 5410) Biochemistry of Proteins and Nucleic Acids
- MSEN 5440 (BIOL 5440) Cell Biology
- MSEN 6313 (EE 6313) Semiconductor Opto-Electronic Devices
- MSEN 6320 (EE6320) Fundamentals of Semiconductor Devices
- MSEN 6321 (EE6321) Active Semiconductor Devices
- MSEN 6322 (EE6322) Semiconductor Processing Technology
- MSEN 6340 Advanced Electron Microscopy
- MSEN 6341 Advanced Electron Microscopy Laboratory
- MSEN 6358 (BIOL 6358) Bionanotechnology
- MSEN 6361 Deformation Mechanisms in Solid Materials
- MSEN 6362 Diffraction Science
- MSEN 6371 (PHYS6371) Advanced Solid State Physics
- MSEN 6374 (PHYS6374) Optical Properties Of Solids
- MSEN 7320 (EE7320) Advanced Semiconductor Device Theory
- MSEN 7382 (EE7382) Introduction to MEMS
- MSEN 7V80 Special Topics in Materials Science and Engineering
- MSEN 8V40 Individual Instruction in Materials Science and Engineering
- MSEN 8V70 Research In Materials Science and Engineering
- MSEN 8V98 Thesis

Doctor of Philosophy in Materials Science and Engineering

Admission Requirements

The University's general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in Materials Science and Engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the MSEN program should meet the following guidelines:

- Student has met standards equivalent to those currently required for admission to the Ph.D. or Master's degree programs in Electrical Engineering, Chemistry, Physics, or Biology.
- a grade-point average in graduate-level course work of 3.5 or better on a 4-point scale
- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Students who fulfill some of the above requirements, if admitted conditionally, will be required to take graduate level courses as needed to make up any deficiencies.

Degree Requirements

The University's general degree requirements are discussed here.

The MSEN Ph.D. requires a minimum of 60 semester hours beyond the Master's degree.

All students must have an academic advisor and an approved degree plan. Courses taken without advisor approval will not count toward the 60 semester-hour requirement. Successful completion of the approved course of studies leads to the MSE.

Each doctoral student must carry out original research in the area of Materials Science and Engineering, under the direction of a member of the Materials Science and Engineering Affiliated Faculty, and complete and defend a dissertation on the research project. A Supervisory Committee will be appointed once the faculty member accepts the student for a research project. Students must be admitted to doctoral candidacy by passing a Qualifying Exam, which will be administered at approximately the time that the students have completed their course work. The rules for the dissertation research and defense are specified by the Office of the Dean of Graduate Studies.

For each of the proposed degree programs, students must pass the following core courses with a grade of B or better:

Note: the presence of a course number in parentheses indicates that this course will be cross-listed with an existing course.

- MSEN 5310 Thermodynamics of Materials
- MSEN 5360 Materials Characterization
- MSEN 6319 Quantum Mechanics for Materials Scientists
- MSEN 6324 (EE 6324) Electronic, Optical and Magnetic Materials

A student may petition for waiver of core courses, and if the Materials Science and Engineering Affiliated Faculty, or a designated committee, finds that the student has mastered the course material, the student may replace that core course with an elective course for a total of twelve semester credit hours.

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- MSEN 8V40 Individual Instruction in Materials Science and Engineering
- MSEN 8V70 Research In Materials Science and Engineering
- MSEN 8V98 Thesis
- MSEN 8V99 Dissertation

Department of Geosciences

Faculty

Professors: Carlos L. V. Aiken, David E. Dunn (emeritus),William I. Manton, George A. McMechan, Richard M. Mitterer, John S. Oldow, Emile A. Pessagno, Jr. (emeritus), Dean C. Presnall (emeritus), Robert H. Rutford (emeritus), Robert J. Stern
Associate Professors: Thomas H. Brikowski, James L. Carter (emeritus), John F. Ferguson
Senior Lecturers: William R. Griffin, Ingnacio Pujana

Objectives

The basic objective of the Department of Geosciences Graduate Program is to provide students with a broad fundamental background in geosciences as well as an in-depth emphasis in a particular specialty.

The Master of Science degree (thesis option) is designed for students desiring research experience in a specific area of the geosciences. This degree will prepare the student for professional employment in the energy, mining, or environmental industries or government, as well as those seeking a doctoral degree. The Master of Science degrees (non-thesis options) are designed for students who seek employment in the energy, mining, or environmental industries, and the industrial application of Geospatial Information Sciences (GIS).

The Doctor of Philosophy degree in Geosciences emphasizes basic research in one of the specialties in geosciences and is designed to prepare students for advanced positions in the energy, environmental or mining professions in industry or government, or for positions in academia.

The Doctor of Philosophy degree in Geospatial Information Sciences (GIS) is supported by the Department of Geosciences, the School of Economic, Political and Policy Sciences, and the School of Engineering and Computer Science. The degree reflects geospatial information science origins at the confluence of work in multiple disciplines. The degree focuses on advancement of the technology, its associated theory, and the enhancement of its applications. Graduates of this program will be well suited to advanced positions in the geospatial technology industry and academic positions.

Facilities

Departmental research facilities include: digital imaging petrographic microscope, rock preparation and mineral separation facilities, electronics shop and machine shop. Separate research facilities for computing, hydrology, thermal ionization mass spectrometry, and geophysics are described below.

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Computing Facilities

The Geosciences Department has a large number of networked Windows/PC and unix/linux workstations in several laboratories accessible to the students and faculty. A number of laser printers are available, including a color printer. A large format HP 2500CP printer/plotter is available for creating maps and posters. A variety of software licenses are supported for GIS, remote sensing, image processing, geophysical data processing, graphics and visualization. Large scale computing is supported by two state of the art linux clusters, one with 10 and one with 32 64-bit processors, and 13 terabytes of disk. A GeoWall visualization facility permits immersive interaction with 3-D data.

Hydrology Laboratory

Field equipment for measuring ground and surface water flow and chemistry, including borehole bailers, electric water level meter, FlowProbe hand-held flow meter, Hach DREL 2010 Basic Water Quality Lab (field spectrophotometer, pH and salinity meters), and YSI-85 DO/salinity/conductivity meter. Software for modeling water flow and transport, including general interfaces GMS andWMS, Hydrus-2D (unsaturated flow and transport), TOUGH2 and Tetrad (2-3D multiphase flow and transport), and many public-domain models. Hardware and software for visualizing model results, including Windows and linux workstations.

Geochemical Laboratories

A Perkin-Elmer 6100 DRC ICP-MS and Perkin-Elmer 3300DV ICP-OES are used for determining concentrations of a wide range of elements in materials. A Finnigan MAT 261 equipped with 9 collectors and a secondary electron multiplier is supported by Class 100 clean room facilities with sub-boiling acid distillation apparatus, micro- and semi-microbalances, and vessels for pressure decomposition of refractory silicates. Studies focus on using the evolution of Sr, Nd and Pb as indexes of petrogenetic processes, geochronology, environmental Pb, and evolution of marine Sr.

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Geophysics Facilities

Geophysical research is supported by two Scintrex CG5 Gravimeters a Micro-g FG5 absolute gravimeter; a variety of surveying instruments including a Nikon theodolite and data collector, a TOPCON GPT 3005LW total station electronic distance meter and theodolite, two Laser Atlanta Advantage CI reflectorless laser rangefinders, a Riegl LMP 3800 laser scanner and a Riegl LSM Z620 laser scanner, six dual frequency Leica 530 RTK GPS systems (4 receivers), three dual frequency Topcon HyperLite RTK GPS systems (6 receivers), nine dual frequence Leica SR9500 GPS receiver systems with choke-ring antennas, a Trimble GeoXT GPS system, a Trimble GeoHT GPS system and GPS post-processing software including Leica SKI and Trimble Pathfinder Office. A Geometrics proton-procession total field magnetometer system, An AGI SuperSting R1/IP DC resistivity and induced polarization system is available for near surface electrical conductivity mapping. Seismic and radar equipment include a Bison 9048 48-channel floating point seismic acquisition system with Betsy, hammer, and explosive sources for shallow to deep exploration; and pulse EKKO IV and 1000 ground penetrating radars.

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Admission Requirements

The University's general admission requirements are discussed here.

Applicants are expected to take the GRE General Test (Verbal, Quantitative, and Analytical Writing). A combined score of no less than 1000 on the Verbal and Quantitative portions of the exam is advisable based on our experience with student success in the program. In addition, students should complete and submit a Supplemental Geosciences Application Form which can be obtained from the Geosciences Department Office by mail (FO21, University of Texas at Dallas, 800 W Campbell Rd, Richardson, TX, 75080, USA), telephone (972-883-2401), or e-mail (geosci@utdallas.edu).

Entering students are expected to have completed the equivalent of the University's B.S. degree in Geosciences, as well as a 3-hour scientific programming course. Students whose undergraduate training is in a science other than geology or geophysics are admitted to the program when their previous course work complements or supports their intended research interests. Students may be admitted with some deficiencies but these must be completed during the first 18 graduate hours. It is understood that the minimum course requirements for the intended degree, as specified below, apply to well-prepared students.

Deleted: All entering students with non-geoscience degrees such as physics, math, chemistry or biology should have completed the following undergraduate courses: physical geology, rocks and minerals, structural geology, and sedimentology. All students are expected to have completed a faculty approved field course.

Degree Requirements

The University's general degree requirements are discussed here. Additional requirements are specified below for each degree.

Graduate Certificate in Remote Sensing

The Remote Sensing Certificate is supported by the Department of Geosciences and the School of Economic, Political and Policy Sciences.

The American Society for Photogrammetry and Remote Sensing (1997) defined remote sensing as the art, science, and technology of obtaining reliable information about physical objects and the environment, through the process of recording, measuring and interpreting imagery and digital representation of energy patterns derived from non-contact sensor systems.

Remote sensing is a powerful set of software and hardware, computer-based techniques for extraction and presentation of information represented by raster and vector spatial data acquired via non-contact sensors. It provides reliable and cost-effective means of studying the environment for protection, natural resources management and urban planning. Government and non-government organizations continuously seek qualified professionals to use remote sensing for a wide range of applications.

Pre-requisites and Admission

- B.S. or B.A. Degree. Competence in personal computers, especially Windows-based, is expected.
- Application for admission to UTD Graduate School as "non-degree or degree seeking"
- Only B.S. or B.A. transcripts are needed. No GRE score, or reference letters are needed for non-degree seeking students.
- On-line registration is at: www.utdallas.edu/admissions

Course Requirements

The Graduate Certificate in Remote Sensing is obtained by completing 15 hours of courses. Students must complete the following courses: GEOS 5325 Introduction to Remote Sensing, GISC 6381 Introduction to GIS, GEOS 5326 or GISC 7365 Remote Sensing Digital Image Processing, GISC 7366 Applied Remote Sensing and GEOS 7327 or GISC 7367 Remote Sensing Workshop.

Master of Science in Geosciences

Thesis Option

All students seeking the Master of Science degree (thesis option) must satisfactorily complete the following requirements (a minimum of 36 graduate semester hours):

- GEOS 5307, GEOS 5327, GEOS 5375, and GEOS 5387
- A minimum of 15 hours of additional graduate courses.
- A minimum of nine semester hours of thesis research including GEOS 8398 and submit an acceptable thesis.

In addition to the above requirements, students seeking the M.S. degree (thesis option) must submit, no later than the second semester of enrollment, an acceptable degree plan and a research proposal to their supervising committee. Upon completion of the thesis research, the M.S. degree candidate will publicly defend the thesis.

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Non-Thesis Option

All students seeking the Master of Science degree (non-thesis option) must satisfactorily complete a minimum of 36 graduate semester hours including the specified Geosciences courses below.

- GEOS 5307, GEOS 5327, GEOS 5375, and GEOS 5387
- A minimum of 21 hours of additional graduate courses, to be selected in consultation with the graduate advisor.
- Research: An 8000 level, 3-hour research course.

In addition to the above requirements, students seeking the M.S. degree (non-thesis option) must submit, no later than the second semester of enrollment, an acceptable degree plan.

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Master of Science in Geographic Information Sciences

The Master of Science in Geographic Information Sciences is a professional program that is offered jointly by the School of Economic, Political and Policy Sciences and the School of Natural Sciences and Mathematics. The program focuses on the use of Geographic Information Systems (GIS) and associated technologies such as remote sensing and global positioning systems for managing spatially referenced information. Students are provided with the concepts underlying GIS, the skills for implementing GIS projects in public and private sector organizations, and the ability to use GIS in pure or applied research in substantive areas. Prospective students should apply using established procedures to either Geosciences or the School of Economic, Political and Policy Sciences depending on their background.

For the Master's degree in Geographic Information Sciences, beginning students are expected to have completed college Mathematics through Calculus and at least one programming or computer applications course or possess equivalent knowledge. Students must have the equivalent of GISC 6381 Geographic Information Systems Fundamentals and GISC 6382 Applied GIS, or they must take these courses at UTD in addition to the 30 credit hours required for the MGIS. Additional details of the curriculum can be found under "Master of Science in Geographic Information Sciences," in the School of Social Sciences section of the catalog.

Doctor of Philosophy in Geosciences

All students seeking a Doctor of Philosophy degree in Geosciences must satisfactorily complete the following requirements (90 graduate hours minimum).

-
- GEOS 5307, GEOS 5327, GEOS 5375, and GEOS 5387
- A minimum of 30 hours of Geosciences graduate courses to be specified by the student's research supervisory committee and the Graduate Advisor.
- A minimum of 40 hours of additional graduate courses or research.
- A minimum of nine semester hours of thesis research including GEOS 8399 and submit an acceptable dissertation.

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In addition to the above course requirements, students seeking the Ph.D. degree must submit an acceptable degree plan and research proposal describing the intended project to be completed for the dissertation. Students entering with a Master's should complete this proposal in the third semester; students entering without a Master's have until the fourth semester. An oral qualifying examination covering the broad background and detailed knowledge relating to the student's specialization and research proposal will be held in the same semester that the proposal is submitted. After satisfactory

performance on the Qualifying Examination, the student will complete and publicly defend the dissertation.

Also, see the University's general degree requirements. Please note that more detailed instructions for Geosciences Graduate students are given in the "Guideline for Graduate Students - Geosciences" that is available in the office of the Department Head.

Doctor of Philosophy in Geospatial Information Sciences

The Doctor of Philosophy in Geospatial Information Sciences is an advanced degree offered jointly by the School of Natural Sciences and Mathematics, the School of Economic, Political and Policy Sciences and the Eric Jonsson School of Engineering and Computer Science. Geospatial information is a unifying theme across a wide range of disciplines and the unique organization of this program permits a diverse range of expertise to the prospective student. The Ph.D. in GIS is intended to go beyond the M.S. in GIS degree in terms of analysis, the creation of new technology and the novel application of geospatial information technology. This program will prepare students for leadership positions in academy, industry or government.

Individual students can concentrate in particular discipline areas. The Geosciences component focuses on remote sensing and mapping technologies, including global positioning satellite and three-dimensional laser ranging based data capture as well as other imaging technologies. In particular, these methodologies are applied to geological, hydrological and environmental problems associated with the physical Earth.

It is expected that students will enter this program with diverse educational backgrounds. Applicants may have Bachelors, Masters or other advanced degrees in any relevant field including computer science, economics, engineering, geography, geology, information system management, resource management, geographical information science and possibly others. At least a Bachelors degree from an accredited (or equivalent) institution with an undergraduate/graduate grade point average of 3.25 or better is required. A GRE score of 1150 or higher is desirable. Fluency in written and spoken English is required. (Please see detailed degree requirements under "Doctor of Philosophy in Geospatial Information Sciences," listed in the School of Social Sciences section of the catalog.)

Graduate Programs in Arts & Humanities

http://www.utdallas.edu/dept/ah/

Faculty

Professors: Charles R. Bambach, Richard Brettell, David F. Channell, Milton A. Cohen, Fred Curchack, R. David Edmunds, Ming Dong Gu, Dennis M. Kratz, Thomas Linehan, Enric Madriguera, Adrienne L. McLean, Mihai Nadin, Zsuzsanna Ozsvath, John J. Pomara, Stephen G. Rabe, Tim Redman, R. Clay Reynolds, Thomas Riccio, Robert X. Rodriguez, Rainer Schulte, Theresa M. Towner, Frederick Turner, Marilyn Waligore
Associate Professors: J. Michael Farmer, Pamela Gossin, Midori Kitagawa, Shelley Lane, Patricia Michaelson, Venus O. Reese, Nils Roemer, Erin A. Smith, Dean Terry, Daniel Wickberg, Michael Wilson
Assistant Professors: Matt Bondurant, Susan Briante, Matthew Brown, Sean Cotter, Frank DuFour, Monica Evans, Eric Farrar, Todd Fechter, Jonathan Frome, Shari Goldberg, John Gooch, Charles Hatfield, Jessica Murphy,Cihan Muslu, Michelle Nickerson, Peter Park, David Parry, Monica Rankin, Natalie Ring, Mark Rosen, Eric Schlereth, Charissa Terranova, Marjorie Zielke**Senior Lecturers**: Bruce Barnes, Lisa Bell, Kelly P. Durbin, Maria Engen, Kathryn C. Evans, Dianne Goode, Michele Hanlon, Peter Ingrao, Janet Johnson, Thomas Lambert, Kathy Lingo, Mary Medrick, Greg L. Metz, Chris Ryan, Monica M. Saba, Jeffrey Schulze, Betty Wiesepape, MaryAnn Young
Emeritus Professors: Joan Chandler, Esteban R. Egea, S. Michael Simpson, Gerald L. Soliday, Deborah Stott

Objectives

The School of Arts and Humanities is committed to interdisciplinary programs that investigate the linkages between the arts and the humanities by fusing critical with creative thinking, theoretical with practical endeavors. Rather than identifying fixed disciplinary areas, the program emphasizes the interrelationship of broad areas of interest.

Within the Graduate Program in Arts and Technology, most courses are offered under the rubric of Arts and Technology (ATEC), but the degree plan also includes courses in Aesthetic Studies (HUAS), History of Ideas (HUHI), and Studies in Literature (HUSL).

Within the Graduate Program in Emerging Media and Communication, most courses are offered under the rubric of Emerging Media and Communication (EMAC), but the degree plan also includes courses in Arts and Technology (ATEC), Aesthetic Studies (HUAS), History of Ideas (HUHI), and Studies in Literature (HUSL).

Within the Graduate Program in the Humanities, most courses are offered within the three main areas of concentration: Aesthetic Studies (HUAS), History of Ideas (HUHI), and Studies in Literature (HUSL), and students seeking the M.A. or Ph.D. degrees in humanities must take courses in all three areas. The fourth area and other courses, including core courses required of all students, are offered under the rubric Humanities (HUMA).

Within the Graduate Program in History, most courses are offered within History (HIST) and History of Ideas (HUHI) but students may also take courses in Aesthetic Studies (HUAS) and Studies in Literature (HUSL).

Within the Graduate Program in Latin American Studies, required courses are offered within Latin American Studies (LATS) and elective courses are drawn from Aesthetic Studies (HUAS), History (HIST), History of Ideas (HUHI), and Studies in Literature (HUSL).

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All our graduate programs are designed to provide students a flexible, interdisciplinary context within which to pursue a program of study built on connections among specific courses and the areas of concentration. Offerings include not only seminars stressing the interpretation and criticism of specific works and issues but also ensembles, studios, and workshops in which the activity of creation and/or performance becomes the primary means of learning.

Facilities

The School of Arts & Humanities provides specialized facilities for academic research and creative expression. The Jonsson Building contains technologically rich environments for studies in Rhetoric, Computer Graphics, Professional Communication, Musical Instrument Digital Interface, and Art & Technology. The Visual Arts Building houses a Media Room as well as studios for painting, photography, sculpture, and other arts. Performance venues for drama and music include the University Theatre and the Jonsson Performance Hall.

Admission Requirements

The University's general admission requirements are discussed here.

Each application is considered on its individual merits. Normally students applying for admission to the Graduate Program in Arts and Technology should have a previous academic degree (B.A. or B.S.) in an appropriate field (i.e., Art, Computer Science), a grade point average of 3.3 (especially in upper-division undergraduate work), and evidence of previous course work and/or expertise in the creative arts and digital technology.

Normally students applying for admission to the Graduate Program in Emerging Media and Communication should have a previous academic degree (B.A. or B.S.) in an appropriate field (i.e., Art, Computer Science, Communication), a grade point average of 3.3 (especially in upper-division undergraduate work), and evidence of previous course work and/or expertise in the creative arts, communications, and/or digital technology.

Normally students applying for admission to the Graduate Program in Humanities should have previous academic degrees (B.A. or M.A.) in arts and humanities fields and a grade point average of 3.3 (especially in upper-division undergraduate or graduate work).

Normally students applying for admission to the Graduate Program in History should have a previous degree (B.A. or B.S.) in history or related disciplines and a grade point average of 3.3 (especially in upper-division undergraduate work).

Normally students applying for admission to the Graduate Program in Latin American Studies should have a previous degree (B.A. or B.S.) in arts and humanities fields, demonstrated interest and experience in Latin American studies and a grade point average of 3.3 (especially in upper-division undergraduate work).

The School of Arts and Humanities does not require the Graduate Record Examination for admission to graduate programs.

Full-time and Part-time Students

Students can pursue the graduate degrees in humanities on a full- or part-time basis. Full-time students normally register for nine or more semester hours per term. The school takes care to accommodate part-time study by scheduling both day and night classes, thus allowing students flexibility in organizing individual schedules.

Degree Requirements

The University's general degree requirements are discussed here.

The approach to graduate education in the School of Arts and Humanities is flexible. Within the specific degree requirements listed below, each student plans a program of studies in consultation with an assigned faculty adviser.

Courses meeting degree requirements are normally chosen from the core courses and the areas of concentration within the School of Arts and Humanities. To have courses taken outside the school applied to one of its degrees, students must seek prior approval from the School's Associate Dean for Graduate Studies. They may also petition to have appropriate transfer courses applied to reduce the required number of hours for a degree at U.T. Dallas. The School's Associate Dean for Graduate Studies may require students with background deficiencies in interdisciplinary work to take additional courses at the undergraduate or graduate level to remedy those deficiencies.

Active involvement in the process of artistic creation and performance is basic to the design of the Aesthetic Studies area of concentration. Therefore, students working in the Graduate Program in the Humanities at the M.A. level with an emphasis on Aesthetic Studies are required to take at least one ensemble/workshop, and those working toward a Ph.D. with an emphasis on this area are required to take at least one additional ensemble/workshop. Students undertaking creative projects for master's portfolios or doctoral dissertations must demonstrate their competency as artists by including in their degree plans a minimum number of studios, ensembles, or workshops related to a proposed medium: two for the M.A. and four for the Ph.D.

Research

The research interests of the faculty reflect the interdisciplinary mission of the School. In addition to the research activities of individual faculty, six centers and institutes that promote interdisciplinary research are located within the School: The Center for Translation Studies; the Ackerman Center for Holocaust Studies; the Confucius Institute; the Institute for Interactive Arts and Engineering; the Center for the Interdisciplinary Study of Museums, and the Center for Values in Medicine, Science and Technology. Since the School combines the Humanities and the Arts, many faculty are engaged in the creation and performance of artistic works in music, drama, literature and the visual arts.

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Item #12II

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: NOVEMBER 10, 2009
TO: GRADUATE DEAN
FROM: MICHAEL WILSON, ARTS & HUMANITIES

BASIS FOR CATALOG CHANGES:

NEW PROGRAMS/DEGREES/CERTIFICATES

M.A. in Latin American Studies

NEW COURSES ADDED

ATEC 6300, ATEC 6332, ATEC 6333, ATEC 6334, ATEC 6335, ATEC 6343, ATEC 6345, ATEC 6352, ATEC 6353, ATEC 6354, ATEC 6355, ATEC 6374, ATEC 6375, ATEC 6376, ATEC 6382, ATEC 6383, ATEC 6384, ATEC 6385, ATEC 6390, ATEC 6397, ATEC 6398, ATEC 6V95, ATEC 7331
EMAC 6300, EMAC 6374, EMAC 6V91
HIST 6301, HIST 6324, HIST 6326, HIST 6327, HIST 6332, HIST 6333, HIST 6335, HIST 6350, HIST 6360, HIST 6365, HIST 6370, HIST 6390, HIST 6395, HIST 6397, HIST 6398, HIST 6399
HUAS 6310, HUAS 6312, HUAS 6317, HUAS 6333, HUAS 6334, HUAS 6336, HUAS 6337, HUAS 6339, HUAS 6347, HUAS 6348, HUAS 6354, HUAS 6355, HUAS 6380, HUAS 6381, HUAS 6383, HUAS 6385, HUAS 6390, HUAS 6397, HUAS 6398, HUAS 7305, HUAS 7320, HUAS 7330, HUAS 7340, HUAS 7350, HUAS 7360, HUAS 7380
HUED 6304
HUHI 6315, HUHI 6320, HUHI 6323, HUHI 6327, HUHI 6329, HUHI 6332, HUHI 6334, HUHI 6335, HUHI 6336, HUHI 6337, HUHI 6338, HUHI 6341, HUHI 6343, HUHI 6344, HUHI 6346, HUHI 6349, HUHI 6395, HUHI 6396, HUHI 6397, HUHI 6398, HUHI 6399, HUHI 7313, HUHI 7314, HUHI 7315
HUMA 6300, HUMA 6330, HUMA 6331, HUMA 6333, HUMA 6390, HUMA 6393, HUMA 6395, HUMA 7V81
HUSL 6313, HUSL 6314, HUSL 6345, HUSL 6373, HUSL 6374, HUSL 6375, HUSL 6376, HUSL 6380, HUSL 6381, HUSL 6383, HUSL 6384, HUSL 6385, HUSL 6386, HUSL 6388, HUSL 6389, HUSL 6392, HUSL

6393, HUSL 6394, HUSL 6395, HUSL 7308, HUSL 7309, HUSL 7350, HUSL 7360, HUSL 7372
LATS 6300, LATS 6390, LATS 6399

COURSES DELETED

ATEC 5349, ATEC 7301
EMAC 5300, EMAC 7301, EMAC 7V81
HIST 5311, HIST 7399, HIST 8303, HIST 8305, HIST 8398
HUAS 6395, HUAS 6396, HUAS 7301, HUAS 7304, HUAS 7310, HUAS 7350, HUAS 7351, HUAS 7352, HUAS 7353, HUAS 7354
HUED 8304
HUHI 7320, HUHI 7345, HUHI 7355, HUHI 7375, HUHI 7379, HUHI 7386
HUMA 5300, HUMA 7320, HUMA 7321, HUMA 7323, HUMA 7330, HUMA 7331, HUMA 7332, HUMA 7333, HUMA 7334, HUMA 7335
HUSL 7321, HUSL 7323, HUSL 7333, HUSL 7334, HUSL 7335, HUSL 7384, HUSL 7385

CHANGES TO EXISTING COURSES

ATEC 6341, ATEC 6351, ATEC 6V81, ATEC 7V81, ATEC 7V82
EMAC 6361, EMAC 6372, EMAC 6V81, EMAC 6383
HUAS 6303, HUAS 6305, HUAS 6315, HUAS 6318, HUAS 6320, HUAS 6330, HUAS 6331, HUAS 6340, HUAS 6373, HUAS 6375, HUAS 7355, HUAS 7390
HUHI 6300, HUHI 6301, HUHI 6305, HUHI 6313, HUHI 6314, HUHI 6325, HUHI 6340, HUHI 6345, HUHI 6347, HUHI 6348, HUHI 7332, HUHI 7355, HUHI 7340, HUHI 7368, HUHI 7387, HUHI 7391, HUHI 7393, HUHI 7397, HUHI 7399
HUMA 6V81, HUMA 7390
HUSL 6304, HUSL 6308, HUSL 6309, HUSL 6310, HUSL 6315, HUSL 6330, HUSL 6340, HUSL 6350, HUSL 6355, HUSL 6360, HUSL 6370, HUSL 6372, HUSL 6390, HUSL 6396, HUSL 6398, HUSL 6399, HUSL 7322, HUSL 7370, HUSL 7390, HUSL 7391

OTHER Due to extensive renumbering across the curriculum, there are changes on every page of the A&H sections of the catalog.

Item #12II

Approved:_____
School/Department

Graduate Program in History

Master of Arts

The program leading to the M.A. in History is designed both for individuals wishing to enhance their knowledge of and skills at the study of the past and for those intending to pursue a doctorate in a related field. Thus, students seeking the M.A. in History have two options, a “research” or a “professional” option. Students with plans for doctoral study should choose the research option.

Students in the research option must complete thirty-six semester hours of course work, demonstrate reading proficiency in an approved foreign language, and successfully complete a master’s thesis.

Core Course (3 hours)

HIST 6301 Historiography
Students are expected to complete this course as early as possible in their programs.

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Electives in History (HIST) or History of Ideas (HUHI) (24 hours)

Twenty-four hours chosen from graduate courses in HIST or HUHI, at least fifteen of which must be in HIST courses. Normally no more than six hours of independent study are applicable to the degree plan.

Elective Course (3 hours)

Three hours in any organized course outside of History (HIST) and History of Ideas (HUHI), but normally in the Humanities Graduate Program.

Thesis (6 hours)

HIST 6398 Master’s Thesis

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Having completed thirty hours of course work, students must write and present a thesis in history for evaluation by a master’s committee.

Students in the professional option in History must complete thirty-six semester hours of course work, including HIST 6301 and normally all in organized HIST and HUHI courses. They are not required to complete a thesis or meet a foreign-language requirement, and they receive a terminal degree.

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Graduate Program in the Humanities

Master of Arts

The program leading to the M.A. in Humanities is designed both for individuals wishing to enhance their knowledge and skills and for students intending to pursue a doctorate in a humanistic field. Thus, students seeking an M.A. in Humanities have two options, a “research” or a “professional” option. Students with plans for doctoral study should choose the research option.

Students in the research option must complete thirty-three semester hours of course work, demonstrate reading proficiency in an approved foreign language, and successfully complete a portfolio.

Core Course (3 hours)

HUMA 6300 Interdisciplinary Approaches to the Arts and Humanities.
Students are expected to complete this course as early as possible in their programs.

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Elective Courses (30 hours)

Thirty semester hours, of which at least twenty-seven hours are normally in organized courses. Eighteen of these hours are divided among organized courses in Aesthetic Studies (6 hours), History of Ideas (6 hours), and Studies in Literature (6 hours). The remaining hours must be taken in the student’s major area of concentration (Aesthetic Studies, History of Ideas, or Studies in Literature), the exception being students pursuing a general Humanities degree. Normally no more than three hours of independent study are applicable to the degree plan. Independent studies do not count toward the 18 hour minimum in the major required for certification to teach at either a two or four year college/university. M.A. students are restricted to courses numbered at the 5000- and 6000-level.

Foreign Language

The research M.A. degree requires demonstrated reading proficiency in an approved foreign language. Students can demonstrate proficiency by passing a translation examination in an approved language (e.g., French, German, classical Greek, Italian, Latin, or Spanish). Intensive review courses (HUMA 6320-6323) and the advanced language workshops (HUMA 6330-6333), which students may take to prepare for the examination, do not count toward minimum course requirements for the degree. Any students wishing to satisfy the requirement with languages other than those listed above must secure the approval of the School’s Associate Dean for Graduate Studies. Students must satisfy the M.A. language requirement before or as they submit their master’s portfolio proposals to the Graduate Studies Committee.

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Portfolio

Two substantial pieces of work (two research papers or a creative project plus a scholarly essay) originating in or completed for graduate courses are revised and presented in a portfolio for evaluation by a master’s committee.

Students in the professional option in Humanities must complete thirty-three hours of coursework, all normally in organized courses and distributed as in the research option above. They are not required to complete a portfolio or meet a foreign language requirement, however, and they receive a terminal degree.

Master of Arts in Teaching

To earn the M.A.T. in Humanities, a degree specifically designed for practicing teachers, students must complete a total of thirty-six semester hours of course work. While most courses are the same as those for other students in the school, some courses are concerned specifically with the school classroom. It is possible for students who are particularly interested in English and History to design their degree programs so that their work in these areas can be focused and set in an interdisciplinary context. The M.A.T. degree does not require demonstration of reading proficiency in a foreign language.

Normally students applying for admission to the M.A.T. program should have a teaching certificate. Students may be teaching full-time while they are pursuing the degree.

Core Courses (6 hours)

HUED 6300 Teaching of the Humanities in the Secondary School
HUMA 6300 Interdisciplinary Approaches to the Arts and Humanities

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Specialization (15 hours)

Fifteen hours in organized courses at the 5000- or 6000-level in one of these areas of concentration: Aesthetic Studies or History of Ideas or Studies in Literature.

Professional Development (6 hours)

Six hours in education courses in addition to HUED 6300. Three hours may be taken as independent study to prepare for the casebook.

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Elective Courses (6 hours)

Six hours of electives at the 5000- or 6000-level in any organized courses outside the area of specialization.

Casebook: HUED 6304 (3 hours)

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The casebook consists of two parts, a critical essay on an interdisciplinary topic as well as a curriculum plan that adopts that topic to the candidate's teaching level in twenty to thirty lesson plans.

Doctor of Philosophy

Students seeking a Ph.D. in the Humanities will normally complete a minimum of sixty semester hours beyond a master's degree or its equivalent, demonstrate advanced proficiency in a foreign language, pass qualifying examinations, and complete and defend a dissertation. In addition to meeting the general university criteria for admission to graduate study, students earning an M.A. degree in the Humanities from UT Dallas must obtain the formal endorsement of their portfolio committees to proceed into the doctoral program. Students who have completed pertinent graduate work at other institutions (thirty hours of humanities courses, language training, and written work roughly equivalent to the portfolio here) may qualify for a Master of Arts equivalency upon admission to the graduate program. Students admitted with an M.A. equivalent must take HUMA 6300.

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Courses (42 hours)

Forty-two semester hours of which at least thirty-three are normally in organized courses. Eighteen of these hours are divided among organized courses in Aesthetic Studies (6 hours), History of Ideas (6 hours), and Studies in Literature (6 hours). The remaining hours may be in one or more of the three areas, and normally no more than nine hours of independent study are applicable to the degree. At least fifteen hours of doctoral coursework must be taken in courses numbered at the 7000-level.

Foreign Language

Students admitted to the Ph.D. program from universities other than UT Dallas must pass a translation examination in an approved foreign language (e.g., French, German, classical Greek, Italian, Latin, or Spanish) during their first year in the Ph.D. program. Part-time students admitted from other universities, however, may have two calendar years to meet this initial requirement. All Ph.D. students must then demonstrate active use of the foreign language at an advanced level in two courses. For this purpose, they may undertake readings and research in regular organized courses, they may meet one half the requirement by taking the Art and Craft of Translation (HUSL 6380) once, or they may arrange to demonstrate active use of the language as part of an independent study. Students wishing to satisfy the requirement with languages other than those listed above must secure the approval of the school's Associate Dean for Graduate Studies.

Students must satisfy the Ph.D. foreign-language requirement prior to taking qualifying examinations.

Doctoral Field Examinations

After completing all the above requirements, students proceed to the doctoral field examinations, a sequence consisting of three written sections and one oral section. The examining committee, composed of three regular members of the faculty, oversees definition and preparation of the three examination fields within guidelines established by the program. At least seven days before the exams themselves, the faculty members submit examination questions to the Arts and Humanities office, which schedules and administers the examination. The maximum time allowed for a student's completion of the examination sequence is twenty business days.

Dissertation (18 hours minimum)

Students are formally advanced to Ph.D. candidacy when they have successfully completed the qualifying examinations and received final approval for dissertation topics. A student may submit a preliminary dissertation proposal for consideration during the oral section of the qualifying examination. In any case, after that examination, a four-person supervising committee is formed, normally from the examining committee plus another regular faculty member proposed by the student, to oversee dissertation work. The supervising committee must then approve a formal dissertation proposal before the student submits it to the Graduate Studies Committee for final approval.

Each candidate then writes a doctoral dissertation, which is supervised and defended according to general university regulation. Every student must register for a minimum of nine hours of dissertation credit in two successive semesters and must maintain continuous enrollment thereafter for at least three semester hours during consecutive long semesters until the degree is completed. Any exception to this requirement is granted only by petition to the school's Associate Dean for Graduate Studies.

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Certificate in Holocaust Studies

The Ackerman Center for Holocausts Studies

The Certificate in Holocaust Studies (Certificate) is offered to MA, MAT, and PhD students in the School of Arts and Humanities (A & H) from The Ackerman Center for Holocaust Studies (Center) at UT Dallas. Students who wish to pursue the Certificate must do so in coordination with A & H's requirements for graduation from their specified program. Graduates of this 15 credit hours certificate will have a critical understanding of the Holocaust as well as modern Jewish culture, the history of anti-Semitism, and the major contemporary philosophical, aesthetic, and analytical responses to this major event.

In order to begin work toward the Certificate, each student must complete a registration form, and is required to be advised each semester by Professor Zsuzsanna Ozsvath or Professor Nils Roemer. In addition, each semester, Certification students must also meet with their academic counselor provided to them by A & H. Certificates can only be awarded to those students who have their advising forms completed from both the School of Arts and Humanities and the UT Dallas Ackerman Center for Holocaust Studies. The Certificate will be awarded in addition to the diploma earned in the student's chosen field after graduation.

The Requirements:

Each student seeking a Certificate in Holocaust Studies must complete 15 Graduate credit hours (hours) chosen from the "Holocaust Certification Courses" below. Students must take 12 of the 15 required hours in organized classes. The remaining 3 hours of coursework may be completed either in an organized class, or by independent study with the permission of the student's Center Advisor. Independent study courses must focus on topics relating to: German history, philosophy, and literature; Interwar Germany; Jewish Studies; or other Holocaust-related topics. Students may not take "Foundation Courses" by independent study.

NOTE: Students enrolled in the professional option of the MA degree may not take an independent study course.

Special Requirements for MAT Students Enrolled in HUAS Degree Plans

MAT students with a concentration in HUAS must take an additional 6 to 9 hours beyond their required 36 hours for the Holocaust Certification unless they receive prior special permission from the Associate Dean for Graduate Studies.

Holocaust Certification Courses

I. Foundation Courses:

HUHI ~~6338~~: The Holocaust

AND

(HUSL 6378: Literature and the Holocaust

(6 hours)

(As new courses are developed, students may substitute a required course with the permission of the Center's Director.)

II. German history, philosophy, and literature:

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HUSL 6375: German Literature and ideas 1870-1960 (3 hours) **OR**

HUSL 6376: Literature of Weimar Germany **(3 hours)**

(As new courses are developed, students may substitute a required course with the permission of the Center's Director.)

III. Jewish Studies:

HUSL 6374: Modern Jewish Literature Across Cultures

AND

HUHI 6336: Modernity, Culture, and the Jews

(6 hours)

(As new courses are developed, students may substitute a required course with the permission of the Center's Director.)

Students with Existing Course Credit:

Students who have completed a minimum of 9 credit hours, as of the date of application for the Holocaust Certificate, may apply their hours toward the above requirements as long as those classes have been taken within the last 24 credit hours or 12 months of prior coursework. The student, however, must be current in their requirements for graduation, and should be prepared to furnish the Center advisor a completed, up-to-date advising form from their A & H Academic Advisor.

Certificate Registration:

Certificate registration forms are available on the table in front of the Arts and Humanities Office as well as online at www.utdalllas.edu/holocaust. Please contact the Center office at 972-883-2100, or by email: holocauststudies@utdallas.edu if you have any questions. Please submit Certification enrollment forms to the Arts and Humanities Office located at JO 4.510.

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(3 hours)¶

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Weimar Germany. (3 hours)

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Graduate Program in Latin American Studies

Master of Arts

The program leading to the M.A. in Latin American Studies allows students to acquire expertise in multiple aspects of Latin America. Building on the unique interdisciplinary structure of the School of Arts and Humanities, the program has an integrated curriculum that connects literary, historical, cultural, and visual studies. Students seeking the M.A. in Latin American Studies have two options, a "research" or a "professional" option. Students with plans for doctoral study should choose the research option.

Students pursuing the research option must complete thirty-six semester hours of course work, demonstrate reading proficiency in an approved foreign language, complete an approved internship or study abroad, and successfully complete a capstone project. Normally no more than six hours of independent study are applicable to the degree plan.

Core Course (3 hours)

LATS 6300: Introduction to Latin American Studies
Students are expected to complete this course as early as possible in their program.

Prescribed Electives (15 hours)

Prescribed electives are selected from the following courses:
HIST 6360: Latin American History
HIST 6365: Mexican History
HUAS 6334: Iberian Culture and Music
HUHI 6315: Thought, Culture, and Society in Latin America
HUSL 6373: Topics in Latin American Literature
HUSL 6380: The Art & Craft of Translation
HUSL 6396: Spanish Language, Literature, and Culture

Free Elective Courses (9 hours)

These three courses may be selected from other courses related to Latin America and/or the students' area of concentration. Students may take approved courses on Latin America topics in the School of Economic, Political, and Policy Sciences and the School of Interdisciplinary Studies.

Free electives must be approved by the Associate Dean for Graduate Studies.

Internship or Study Abroad (3 hours)

Students will also complete a minimum of 3 semester credit hours in an approved study abroad immersion program or a comparable internship program established in partnership with UT Dallas and businesses and/or non-for-profit agencies in the Dallas-Fort Worth area.

LATS 6390: Internship in Latin American Studies

Capstone Project (6 hours)

LATS 6399: Capstone Project in Latin American Studies
Having completed thirty hours of course work, students must write and present a capstone project on a topic of their choice in Latin American Studies, either a research thesis or final project.

Item #12LL

Students pursuing the professional option in Latin American Studies must complete thirty-six semester hours of course work, including LATS 6300 and 15 hours of prescribed electives, demonstrate reading proficiency in an approved foreign language, and complete an approved internship or study abroad. They are not required to complete a capstone project and they receive a terminal degree. Normally no more than six hours of independent study are applicable to the degree plan.

Master of Arts in International Management Studies

Degree Requirements

The University's general degree requirements are discussed here.

The M.A. degree is obtained by completing satisfactorily a 36-hour program beyond prerequisite courses for School of Management graduate programs. The program provides students the opportunity to learn in-depth the fundamentals of (1) functional areas of management, (2) international management, and (3) cultural, sociopolitical and geographical constraints affecting international business decisions. It also provides educational opportunities for the student with non-business undergraduate training to prepare for a career in the management of international trade and industry.

The School of Management encourages all students studying for the M.A. degree to master one foreign language. However, equally important is direct experience of business practices in a foreign country. In the past, U.T. Dallas has organized study abroad opportunities in Russia, China, Hong Kong, Singapore, Vietnam, Thailand, Indonesia, and India. Foreign study courses, usually offered between semesters, vary in length from two to three weeks and are generally taken as part of an Area Studies course.

Students must maintain a 3.0 grade point average in both core courses and in aggregate courses to qualify for the M.A. degree.

Business Core Courses (8 hours)

AIM 6201 Financial Accounting
MKT 6301 Introduction to Marketing Management
FIN 6301 Financial Management

International Management Core Courses (17 hours)

The following 4 courses:

IMS 5200 Global Business
IMS 6310 International Marketing Management
IMS 6360 International Strategic Management
IMS 6365 Cross Cultural Communications and Management

Plus 6 hours from the following:

IMS 6202 International Business Transactions
IMS 6220 International Corporate Finance or FIN6366 International Financial Management
BPS 6332 Strategic Leadership
IMS6312 International Advertising
IMS6314 Global E-Business Marketing

Electives (11 hours)

An additional eleven semester hours of elective courses in the School of Management are required. Four hours from Area Studies (IMS 7250-55) are recommended. International courses from other Schools may be taken with permission of the appropriate Program Director.

Students seeking the M.A. degree are encouraged to complete the Business Core courses by the end of the fall semester before beginning the International Management Core courses. Students are strongly advised to start with the first course in the sequence, Global Economy, and to continue through to the last course, International Business Management, which serves as a capstone for the International Management curriculum.

Item #12NN

Department of Mechanical Engineering

http://ecs.utdallas.edu/ME/

Faculty

Professors: Andrew J. Blanchard, Cyrus D. Cantrell III, Yves .J. Chabal, Bruce E. Gnade, Matthew J. Goeckner, Louis R. Hunt (Emeritus), Moon J. Kim, Mario Rotea, Mark W. Spong, Mathukumalli Vidyasagar, Robert M. Wallace
Associate Professors: Gerald O. Burnham, Kyeongjae Cho, Jiyoung Kim, Jeong-Bong Lee
Assistant Professors: Fatemeh Hassanipour, Walter Hu
Visiting Assistant Professors: Greg Lee.

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Objectives

The program leading to the M.S.M.E. degree prepares both recent baccalaureate graduates and experienced mechanical engineers for advanced micro-scale and nano-scale mechanical and thermal design and development. It is designed to serve the needs of engineers who wish to continue their education. Courses are offered at a time and location convenient for the student who is employed on a full-time basis.

Facilities

The Engineering and Computer Science Building and the new Natural Science and Engineering Research Laboratory provide extensive facilities for research on micro-scale and nano-scale systems. A Class 10000 microelectronics clean room facility, including e-beam lithography, sputter deposition, PECVD, LPCVD, etch, ash and evaporation, is available for student projects and research.

In addition to the facilities on campus, cooperative arrangements have been established with many local industries to make their facilities available to U.T. Dallas graduate engineering students.

Master of Science in Mechanical Engineering

Admission Requirements

The University's general admission requirements are discussed here.

A student lacking undergraduate prerequisites for graduate courses in mechanical engineering must complete these prerequisites or receive approval from the graduate adviser and the course instructor.

A diagnostic exam may be required. Specific admission requirements follow.

The student entering the M.S.M.E. program should meet the following guidelines:

- An undergraduate preparation equivalent to a baccalaureate in mechanical engineering from an accredited engineering program,

- A grade point average in upper-division quantitative course work of 3.0 or better on a 4-point scale, and

- GRE scores of 500, 700 and 4 for the verbal, quantitative and analytical writing components, respectively, are advisable based on our experience with student success in the program.

Applicants must submit three letters of recommendation from individuals who are able to judge the candidate's probability of success in pursuing a program of study leading to the master's degree. Applicants must also submit an essay outlining the candidate's background, education and professional goals. Students from other engineering disciplines or from other areas of science or mathematics may be considered for admission to the program; however, some additional course work may be necessary before starting the master's program.

Degree Requirements

The University's general degree requirements are discussed here.

The M.S.M.E. requires a minimum of 33 semester hours.

All students must have an academic advisor and an approved degree plan. These are based upon the student's choice of concentration (Microelectromechanical Systems or Mechanical Systems Engineering). Courses taken without advisor approval will not count toward the 33 semester-hour requirement. Successful completion of an approved course of studies leads to the M.S.M.E. degree.

The M.S.M.E. program has both a thesis and a non-thesis option. All part-time M.S.M.E. students will be assigned initially to the non-thesis option. Those wishing to elect the thesis option may do so by obtaining the approval of a faculty thesis supervisor.

All full-time, supported students are required to participate in the thesis option. The thesis option requires six semester hours of research, a written thesis submitted to the graduate school, and a formal public defense of the thesis. The supervising committee administers this defense and is chosen in consultation with the student's thesis adviser prior to enrolling for thesis credit. Research and thesis hours cannot be counted in a M.S.M.E. degree plan unless a thesis is written and successfully defended.

M.S.M.E.

One of the two concentrations listed below, subject to approval by a graduate adviser, should be used to fulfill the requirements of this program. Only grades of B or better are acceptable in the five required core courses, MECH 6305, MECH 6340, MECH 6301, MECH 6310, and MECH 6331.

Microelectromechanical Systems

This concentration emphasizes the mechanical and thermal design, fabrication and testing of micro-scale and nano-scale microelectromechanical systems.

Each student electing this concentration must take four prescribed elective courses and two free electives to make a total of 33 hours.

The prescribed elective courses for this concentration are MECH 6382, MECH 6302, MECH 6315, MECH 6320, MECH 6321, MECH 6322, MECH 6381, MECH 6385, MSEN 5300, MECH 6310, MSEN 5340,

MSEN 5353, MSEN 6310, MSEN 6361, and PHYS 6377.

Mechanical Systems Engineering

This concentration is focused on the fundamental principles, design, fabrication and analysis of complex mechanical systems.

Each student electing this concentration must take four prescribed elective courses and two free electives to make a total of 33 hours.

The prescribed elective courses for this concentration are MECH 6302, MECH 6315, MECH 6320, MECH 6321, MECH 6332, MECH 6336, MECH 6381, MECH 6385, MSEN 6310, MSEN 6361, and PHYS 6377.

Mechanical Engineering Course Descriptions

MECH 6301 (Same As MSEN 6310) **Mechanical Properties of Materials** (3 semester hours) Phenomenology of mechanical behavior of materials at the macroscopic level and the relationship of mechanical behavior to material structure and mechanisms of deformation and failure. Topics covered include elasticity, viscoelasticity, plasticity, creep, fracture, and fatigue. Prerequisite: MECH 3301 or equivalent. (3-0) Y

MECH 6302 Dynamics of Complex Structures (3 semester hours) Design, development, manufacturing and analysis of large, complex mechanical systems. Prerequisite: MECH 3302 or equivalent. (3-0) Y

MECH 6305 CAD Technology (3 semester hours) Introduction to computer-aided design. Principles of geometrical modeling. Curve and surface fitting in an automated environment. CAD/CAM simulation of manufacturing. Computer-aided solid modeling. Prerequisites: MECH 3305 or equivalent. (3-0) Y

MECH 6310 Intermediate Fluid Mechanics (3 semester hours) Ideal fluid flow including potential flow theory. Computer solutions in ideal fluid flow. Viscous flow and boundary layer theory. Introduction to turbulence. Prerequisite: MECH 3310 or equivalent. (3-0) Y

MECH 6315 Advanced Fluid Mechanics (3 semester hours) A mechanically and mathematically sophisticated introduction to the fundamentals of fluid mechanics. This course is intended to provide the beginning graduate student with a broad background in the fundamentals of fluid mechanics and an introduction to the various flow regimes. After completing this course, the student should be prepared to take subsequent courses in a broad range of engineering disciplines, such as mechanical, bioengineering, aerospace, and civil engineering. Derivation of the governing equations of motion. An introduction to viscous, inviscid, turbulent, and boundary-layer flows. Prerequisite: MECH 3310 or equivalent. (3-0) T

MECH 6320 Conductive Heat Transfer (3 semester hours) Introduction to fundamentals of conductive heat transfer with an emphasis on numerical and analytical solutions. Steady and transient one- and multi-dimensional thermal conduction. Emphasis on analytical methods, numerical techniques and approximate solutions. Prerequisite: MECH 3320 or equivalent. (3-0) T

MECH 6321 Convective Heat Transfer (3 semester hours) A rigorous and advanced development of the fundamentals of convective heat transfer and its applications. Convection (forced and free) in laminar and turbulent, internal and external flows. Analogy between momentum and heat transfer. Scaling laws and modeling. Prerequisite: MECH 3320 or equivalent. (3-0) T

MECH 6322 (EEMF 6322, MSEN 6322) Semiconductor Processing Technology (3 semester hours) Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T

MECH 6331 Systems and Control Theory (3 semester hours) Systems and control theory: state space, convolution integrals, transfer functions, stability, controllability, observability, and feedback. Prerequisites: MECH 2300 and MECH 4310 or equivalents. (3-0) Y

MECH 6332 (EEGR 6332) Advanced Control (3 semester hours) Modern control techniques in state space and frequency domain: optimal control, robust control, and stability. Prerequisite: MECH/EE 6331. (3-0) R

MECH 6336 (EEGR 6336) Nonlinear Control Systems (3 semester hours) Differential geometric tools, feedback linearization, input-output linearization, output injection, output tracking, stability. Prerequisite: MECH/EE 6331. (3-0) R

MECH 6340 Intermediate Mechanical Vibrations (3 semester hours) Fundamental phenomena of multi-degree discrete and continuous systems. Matrix methods of solution of discrete systems. Determination of natural frequencies and mode shapes of discrete and continuous systems. Passive methods of vibration control. Applications of finite element methods to analysis of mechanical vibrations. Prerequisite: MECH 3302. (3-0) Y

MECH 6361 Deformation Mechanisms in Solid Materials (3 semester hours) Linear elastic fracture mechanics, elastic-plastic fracture mechanics, time dependent failure, creep and fatigue, experimental analysis of fracture, fracture and failure of metals, ceramics, polymers and composites. Failure analysis related to material, product design, manufacturing and product application. Prerequisite: MECH 6301. (3-0) T

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MECH 6381 (EEGR 6381) Numerical Methods In Engineering (3 semester hours) Numerical techniques in engineering and their applications, with an emphasis on practical implementation. Topics will include some or all of the following: numerical methods of linear algebra, interpolation, solution of nonlinear equations, numerical integration, Monte Carlo methods, numerical solution of ordinary and partial differential equations, and numerical solution of integral equations. Prerequisites: CE/EE/MECH 2300 and CE/EE/MECH 3300 or equivalents, and knowledge of a scientific programming language. (3-0) T

MECH 6382 (EEMF 6382) Introduction to MEMS (3 semester hours) Study of micro-electro-mechanical devices and systems and their applications. Microfabrication techniques and other emerging fabrication processes for MEMS are studied along with their process physics. Principles of operations of various MEMS devices such as mechanical, optical, thermal, magnetic, chemical/biological sensors/actuators are studied. Topics include: bulk/surface micromachining, LIGA, microsensors and microactuators in multi-physics domain. (3-0) T

MECH 6385 Computational Modeling of Mechanical Systems (3 semester hours) Modeling of mechanisms, thermal systems and fluid flow using the finite-element method. Prerequisite: MECH 6381 or equivalent. (3-0) T

MECH 6V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

MECH 7V80 Special Topics In Mechanical Engineering (1-6 semester hours) (May be repeated to a maximum of 9 hours.) For letter grade credit only. ([1-6]-0) S

MECH 8V70 Research In Mechanical Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

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MECH 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

Graduate Programs in Management

http://som.utdallas.edu/

Faculty

Professors: Ashiq Ali, Alain Bensoussan, Ramaswamy Chandrasekaran, William Cready, Rachel Croson, Milind Dawande, Theodore Day, Gregory Dess, Adolf J.H. Enthoven, David L. Ford, Jr., Varghese S. Jacob, Constantine Konstans, Stan Liebowitz, Sumit Majumdar, David Mauer, Vijay Mookerjee, B.P.S. Murthi, Shun Chen Niu, Mike Peng, Hasan Pirkul, Suresh Radhakrishnan, Srinivasan Raghunathan, Ram C. Rao, Brian Ratchford, Michael Rebello, Sumit Sarkar, Suresh P. Sethi, Chelliah Sriskandarajah, Kathryn Stecke, John Wiorkowski, Harold Zhang
Associate Professors: Mark Anderson, Indranil Bardhan, Norris Bruce, Metin Cakanyildirim, J. Richard Harrison, Ernan Haruvy, Ganesh Janakiraman, Surya Janakiraman, Robert Kieschnick, Nanda Kumar, Seung-Hyun Lee, Zhiang (John) Lin, Livia Markoczy, Stan Markov, Syam Menon, Ramachandran Natarajan, Ozalp Ozer, Ashutosh Prasad, Orlando Richard, Young Ryu, Jane Salk, David Springate, Eric Tseng, Yexiao Xu, Eric Zheng.
Assistant Professors: Jayatirtha Asundi, Nina Baranchuk, Octavian Carare, Huseyin Cavusoglu, Zhonglan Dai, Kutsal Dogan, Rebecca Files, Xianjun Geng, Umit Gurun, Todd Kravet, Xu Li, Elisabeth Ngah-Kiing Lim, Xiaohui Liu, Volkan Muslu, Valery Polkovnichenko, Roberto Ragozzino, Gonca Soysal, Andrei Strijnev, Upender Subramanian, Mark Vargus, Minhua Wan, Yu Wang, Kelsey Wei, Yuanping Ying, Wei Yue, Alejandro Zentner, Jun Zhang, Qin Zhang, Feng Zhao, Yibin Zhou.
Senior Lecturers: Joachim Adler, Art Agulnek, Shawn Alborz, Frank Anderson, John Barden, George Barnes, Abhijit Biswas, Ron Blair, Daniel Bochsler, Tiffany Bortz, LeeAnn Butler, Mary Chaffin, Mary Beth Goodrich, Maria Hassenhuttl, Jonathon Hochberg, Jennifer Johnson, Marilyn Kaplan, Jackie Kimsey, Chris Linsteadt, Diane S. McNulty, Radha Mookerjee, Madison Pedigo, Joseph Picken, Nataliya Polkovnichencko, Matt Polze, Carolyn Reichert, Robert Robb, Tracey Rockett, Mark Salamasick, Phil Sanchez, Michael Savoie, Avanti Sethi, Jeanne Sluder, Charles Solcher, Lou Thompson, Mark Thouin, Amy Troutman, John Watson, Habte Woldu, Laurie Ziegler
Clinical Faculty: David Cordell, Tevfik Dalgic, Forney Fleming, Charlie Hazzard, Rob Hicks, Peter Lewin, Holly Lutze, John McCracken, Kumar Nair, Divakar Rajamani, Rajiv Shah, Fang Wu
Visiting Faculty: Usman Ghani, Francisco Szekely

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Objectives

The **Master of Business Administration** degree provides students with a broad managerial education drawing from all business disciplines. It is obtained by completing the program course requirements of 53 hours beyond the prerequisites. U.T. Dallas offers several distinct approaches to obtaining an MBA. These include (1) the Cohort MBA Program, a full-time program in which students are admitted as a group each Fall and take their required classes together in a fixed sequence, (2) the Professional MBA Program for students attending school part-time, with classes largely meeting in the evening, and (3) the Global MBA Online with all core and elective courses available by distance learning, online.

Each of these MBA programs consists of 29 hours of required core courses and 24 hours of elective course work, which may include an optional concentration in a selected area of business study. Courses in the Global MBA Online use audio streaming lectures supported by downloadable presentations, online text-based conferences, bulletin board and e-mail exchanges, and teleconferences.

The M.A. in International Management Studies degree provides knowledge of and training in international management, which includes trade across national boundaries, management practices within foreign nations, and management on a global basis. The program provides students the opportunity to learn in-depth the fundamentals of (1) functional areas of management, (2) international management, and (3) cultural, sociopolitical, and geographical constraints affecting international business

decisions. In the past, the School has organized study abroad opportunities in Russia, China, Hong Kong, Singapore, Vietnam, Thailand, Indonesia, and India. Foreign study courses, usually offered between semesters, vary in length from two to three weeks and are generally taken as part of an Area Studies course. Many classes for this degree must be taken via distance learning.

The **M.S. in Accounting and Information Management** provides a tailored educational experience that encourages (1) a globally-oriented, interdisciplinary focus, (2) a balanced conceptual and pragmatic approach, (3) development of written and oral communication skills, (4) a refinement of research and analytical skills that result in enhanced decision-making abilities, and (5) a commitment to life-long learning. The Accounting and Information Management Program is a leader in developing the professional skills that are needed for the core services identified by the Institute of Certified Public Accountants as being fundamental to the future of the profession. Students are offered a choice among seven concentrations that relate to these core services including financial analysis, audit and professional services, taxation services, information management services, international services, management consulting, and internal audit. Upon completion of the M.S. in Accounting and Information Management, students may sit for the Uniform CPA Examination, provided they meet the educational requirements.

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The **M.S. in Information Technology and Management** bridges the gap between the pure information technologist and the business professional. By providing a technology intensive program with a business focus, the program prepares graduates to apply information technology to business problems and create efficient and effective solutions. The degree requires a minimum of 36 credit hours, consisting of basic business courses, IT foundation courses, IT elective courses, and free electives. The business core courses are designed to provide incoming students with the context to better appreciate and understand the complex issues that occur at the interface between IT and business. The IT foundation courses cover the essentials of IT knowledge that any student must possess. The IT elective courses provide in-depth knowledge of the technology and technology management issues. In addition, students may choose approved electives that maximize their individual educational and professional goals. The program also offers opportunities for students to concentrate in specific tracks such as '*Enterprise Systems*', *'Business Intelligence',* '*Healthcare Systems*', and '*Information Security*' depending on their interests and goals.

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The **M.S. in Management and Administrative Sciences** degree provides students the opportunity for specialized education in a specific management discipline built upon a core of business courses. It is obtained by completing the program course requirements of 36 hours beyond all prerequisites. The program consists of 10 hours of business core courses, and the remaining hours as elective courses. Potential concentration areas for students include: accounting, enterprise systems, internal audit, corporate finance, investments, marketing, e-commerce, information systems, operations and supply chain, organizations, strategy and international topics. The classes for this degree are largely offered in the evenings.

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The M.S. in Healthcare Management prepares students for roles in the leadership and management of the US healthcare industry. The 36 credit hour program integrates a thorough grounding in advanced business management theory and practice with an understanding of the structure, operation and financing of the US healthcare system. The curriculum is customized to accommodate the needs of two different audiences: the Professional Track for healthcare administrators and those desiring a management career in healthcare; and the Executive Track, for physicians and senior level healthcare executives.

Deleted: The evening programs, MBA, M.A., and M.S., serve primarily employees of the companies in the Dallas/Fort Worth Metroplex. The daytime, full-time, Cohort MBA program enrolls students selected from local, national, and international applicants. The Global MBA Online serves students seeking a flexible schedule or who live too far from campus as well as students emphasizing international management and information technology.¶

The Professional Track classes are offered on a semester-long basis in the evenings, with core business classes also offered online. Admission may be in Fall, Spring, or Summer semesters.. The Executive Track is delivered in a different format, consisting of nine 4-day residential classes. A different class is offered every two months and classes may be started at any time and taken in any order. The Executive curriculum is jointly taught by faculty from the University of Texas at Dallas School of Management and the University of Texas Southwestern Medical Center. The Executive program is entirely supported by participant fees and special admission requirements apply. For information, contact the program office at (972) 883-6252.

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The **M.S. in Finance** is designed for students with or without previous educational background in finance. Candidates in the M.S. in Finance choose one of four concentrations: Financial Analysis, Financial Management, Financial Risk Management, and Financial Engineering. The Financial Analysis concentration is designed for students interested in pursuing a career as a financial analyst and completing the Chartered Financial Analyst (CFA) examinations. The Financial Management concentration allows students to tailor their course work for careers in a range of activities: e.g., corporate finance, investment banking, venture capital, private equity, commercial banking, insurance, etc. The Financial Risk Management concentration is designed for students interested in a career in financial risk management and one of the financial risk management certifications. The Financial Engineering concentration is designed for students with the quantitative ability to purse a career applying quantitative methods to investment and risk management problems. Because several of these concentrations designed to best prepare students for certain certifications, students are required to complete all the course work in a particular concentration to graduate with that concentration.

The **M.S. in Supply Chain Management** (SCM) will explore the key issues associated with the design and management of industrial supply chains. It will entail concepts dealing with the improvement of supply chain operations towards lower costs, faster delivery, higher quality and bigger variety. The ultimate objective is using SCM to mold traditional business operations into competitive weapons for today's global economy. Students will acquire not only fundamental knowledge of business management but also analytical decision-making skills (especially for complex systems) along with real-life experiences gained through projects with area companies.

The School of Management also offers **Executive Education** degree programs. Executive Education MBA programs are offered for students with several years of experience. These include (1) the Executive MBA Program with classes meeting for two days (Friday and Saturday) every other week, (2) the Executive MBA with emphasis in Project Management that highlights managing complex projects, (3) the Healthcare Management Executive MBA for physicians and senior level healthcare executives interested in learning how to improve the leadership and management of their organizations, and (4) Global Leadership Executive MBA primarily delivered by distance learning with a focus on international management. Students in Executive Education programs are assessed program related fees beyond those charged to other graduate students to cover the additional costs of unique scheduling, events, and services associated with these programs. Each of these programs requires 53 credit hours to graduate.

Leaders in high tech firms often need expertise in both engineering and management. Through a unique combined master's level degree program, graduate students may earn an **M.S.E.E.** degree from the Jonsson School of Engineering and Computer Science in combination with an **MBA**, an **M.S**. or an **M.A**. degree from the School of Management. This combined degree program is ideal for students interested in managing new technologies, from conceptualization and development to introduction and production. Students must meet the admission requirements in both schools and have an advisor in both schools. The combination of M.S.E.E. and MBA degrees can be earned by completing a minimum of 68 graduate hours, compared to 86 hours if completing the two degrees separately. The combination of M.S.E.E. and M.S. or M.A. degrees can be earned by completing a minimum of 51 credit hours beyond prerequisites, compared to 69 hours if completing the two degrees separately. See page XX in the Electrical Engineering section for details.

The **Ph.D. in International Management Studies** provides the opportunity to conduct research in the analysis of international business, emphasizing a strong foundation in theory and research in organizations and strategy. International Management Studies focuses on the analysis of organizations, industries, and markets as interdependent systems, stressing structural, strategic, environmental, and international considerations and their implications for management. Topics such as corporate strategy, international business, multinational management, organization design and change, technological and industrial development, and managerial decision making are examined using management theories and empirical methods.

Deleted: organizational design and change,

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The **Ph.D. in Management Science** provides the opportunity to conduct research in a functional business area to contribute to the knowledge in that field with respect to its intellectual content or professional practice. The School of Management defines Management Science as the use of economics, behavioral science, mathematics, and statistics, to conduct rigorous scientific research. It encompasses both theory and empirical analysis. Management Science embraces areas of specialization like marketing, finance, accounting, organizational behavior, management strategy and public policy, and decision sciences. It has no clear boundaries among the various areas, and places emphasis on science and is not constrained by the culture of individual disciplines. It is this underlying orientation of science and integration that distinguishes Management Science from other philosophies and approaches to the study of management.

Both doctoral programs offer preparation for academic and/or research positions in universities, with organizations such as the World Bank, and in industry, both in the United States and in other countries.

Facilities

The School of Management is located in a new facility at the corner of University Parkway and Drive A. This 200,000 square foot building opened in the Fall of 2003. The three wings, arranged around a courtyard, provide classrooms, meeting rooms, and office space. State-of-the-art wireless access to the internet will be available throughout the facility.

Admission Requirements to Master's Programs

The University's general admission requirements are discussed here.

Evening and Online programs (MBA, Global MBA Online, M.A., M.S)

Admissions to the evening programs are based on a consideration of the applicants' entire record. The following factors are considered in arriving at an admission decision:

- a bachelor's degree from an accredited institution in the United States, or its equivalent, as determined by the Dean of Graduate Studies,
- international applicants must submit a TOEFL score of at least 550 on the paper test (or 215 on the computerized test) that is less than two years old,
- undergraduate GPA, calculated on the last 60 hours of academic course work,
- honors and achievements,
- personal essay outlining academic interests and goals
- letters of recommendations (3),
- work experience,
- competitive GMAT performance based on a score that is less than seven years old
- personal characteristics that add to the diversity of the class, such as country of citizenship, gender, multilingual skills, involvement in extracurricular and community activities and socioeconomic history.

Applications are due in the Admissions Office 90 days prior to registration for international students and 45 days prior to registration for all other students. Students are admitted 3 times per year and can start their studies during any one of the three semesters.

Students may apply for the Dean's Excellence Award which provides financial support in the form of scholarships.

The Global MBA Online has the same admission requirements and tuition as the traditional MBA. And the Online program follows the same academic calendar as the rest of the University. These students receive priority registration for online courses.

Full-time (Cohort) MBA program: In addition to the factors required for admission to the evening programs, admission to the Full-time, Cohort MBA program requires the capability to perform well in a fast-paced, team-oriented curriculum Applicants are admitted based on a composite evaluation of the submitted measures of performance which include the GMAT, GPA, recommendation letters, and work experience, as well as initiative and interest suggested through essays. The Admission Committee seeks academic and professional excellence. Applications completed by May 1 will be considered for financial support. International applications are due June 1 and domestic applications by July 1. Students are admitted each fall.

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Executive MBA programs: Admissions are based on academic transcripts, a personal essay, letters of recommendation, and knowledge of elementary calculus and basic financial accounting. Also, approximately 10 years of business experience with relevant managerial experience, the ability to use a DOS-based personal computer, with Windows, for word processing and spreadsheets (possession of a laptop computer with modem and Internet access is required), and corporate endorsement and support in the case of employed participants. The GMAT is encouraged, but not required. Applications are due by June 30, and students are admitted each fall.

Master of Science in Healthcare Management: The M.S. in Healthcare Management is customized to accommodate the needs of two different audiences: the Professional Track for healthcare administrators and those desiring a management career in healthcare; and the Executive Track, for physicians and senior level healthcare executives. The admission requirements for the Professional Track are the same as those listed above for all other School of Management evening and online degree programs.

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For physicians, admission to the Executive Track requires an MD or DO degree from an accredited school of medicine or school of osteopathy, a copy of a current unrestricted license to practice medicine in the U.S., and medical school and undergraduate transcripts. For healthcare executives, the requirements include seven or more years of senior management experience in a U.S. healthcare organization; a baccalaureate degree with an undergraduate GPA of 3.0 or higher; the ability to successfully perform graduate level work as evidenced by either a Master's degree or higher from a U.S. accredited college or university or by providing an acceptable GMAT score; two confidential letters of reference from professional colleagues; a written statement of professional objectives; and a personal or telephone interview at the option of the program director.

Non-Degree Seeking Students: Students may be admitted as non-degree seeking students. To be admitted as a non-degree seeking student, students will have to meet all the admission requirements specified for degree seeking students including relevant test scores (GMAT/GRE, TOEFL). Students who want to switch to degree-seeking status, will have to apply to the degree program. If they are admitted, at most six credits taken as a non-degree seeking student can be transferred to the degree program.

Conditional acceptance to the School may be granted with the recommendation of the Admissions Committee and the concurrence of the Dean of Graduate Studies. At the time of their acceptance, the students will be informed of the conditions they need to satisfy to become regular students. The students can be in conditional status for only one semester and need to fulfill the stipulated conditions by the end of the semester. Conditionally accepted students will be restricted to:

- taking at most six credits during the semester,
- enrolling in courses from a pre-specified list.

Substitutions and Transfers of Credit

Substitutions of program requirements may be granted in recognition of previous coursework taken in a specific business program area. Substitutions are approved by the appropriate Program Director through a process which allows a student to skip a core course and take the next higher level course in that area with no reduction in the overall program hour requirements.

Transfers of credit may be granted for equivalent graduate coursework taken at other universities with a grade of B or better within the past six years. The appropriate Program Director initiates such transfers which must be approved by the Dean of Graduate Studies. The total number of transfers of credit toward the completion of a master's degree cannot exceed twelve hours toward the M.A. and M.S. degree, and fifteen hours toward the MBA degree.

Applications for approval of substitutions and transfers of credit may be obtained in and submitted to the School of Management Advising Office.

Prerequisites for Graduate Programs

Knowledge of calculus and competence in personal computing are requirements for the programs. Students who have not completed an undergraduate calculus course at the level of MATH 1325 or higher may satisfy the prerequisite by completing MATH 5304 Applied Mathematical Analysis for Non-majors. Competence in personal computing may be demonstrated in one of three ways: having completed BA 3351 with a grade of B or better, having completed an equivalent course at another university with a grade of B or better, or passing an exam. A modest fee is required to take the exam. Degree credit is not earned for program prerequisites; however, the grade achieved in MATH 5304 will count toward the student's grade point average. For the M.A. in International Management Studies, FIN 6301 has a prerequisite of OPRE 6301, its equivalent, or consent of instructor. Prerequisites must be satisfied within the first twelve hours of graduate study as a degree-seeking student.

SCHOOL OF MANAGEMENT

The School of Management was established in 1975 as the academic unit responsible for (1) the Master of Science (M.S.) degree in Management and Administrative Sciences; (2) the Master of Arts (M.A.) degree in International Management Studies; (3) the Doctor of Philosophy (Ph.D.) degrees in Management Science and in International Management Studies; and (4) an upper-division program leading to a Bachelor of Science (B.S.) degree in Business Administration.

The School added a Master of Business Administration (MBA) degree in 1983, and in 1992, in conjunction with U.T. Dallas's expansion to include a full undergraduate program, lower-division instruction was initiated. The Master of Science in Accounting started in 1994 and the name changed to Master of Science in Accounting and Information Management in 2001. In 1996, the School added the Cohort MBA, a full-time MBA program in which students take all of their courses together in a fixed sequence.

In 1997, the School formed a strategic alliance with The University of Texas Southwestern Medical Center at Dallas to offer a Master of Science in Medical Management for medical doctors. In 2007, the program was split into two parts and renamed the Master of Science in Healthcare Management Executive Track in 2007 (for medical doctors) and the Master of Science in Healthcare Management Professional Track for all other healthcare professionals.

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To help bridge the gap between business and information technology, the School established the Master of Science in Information Technology and Management in 2003. . In Fall, 2008, the school added two new masters degree programs, the M.S. in Finance and the M.S. in Supply Chain Management.

Since its inception, the School of Management has offered a range of degree options and program formats designed to serve the diverse needs of a student population primarily composed of working adults, but also including traditional full-time graduate students and, more recently, residential undergraduate students.

The graduate programs in the School of Management stress the theory and use of applied sciences for successful management and administration of private and public institutions. Courses provide an opportunity to gain integrated and detailed knowledge of the functional areas of management as well as analytical tools for effective appraisal and decision making. Seminars and research on specific projects are designed to develop creativity and to stimulate the student toward an integrated application of the acquired knowledge.

With over 35 years of operating history and with the rapid development in the "Telecom Corridor" area surrounding the campus, U.T. Dallas's School of Management has become a major provider of management education to many global corporations.

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The School of Management's mission is to meet the challenges of a rapidly changing, technology-driven, global society by partnering with the business community to:

- deliver high quality management education to a diverse group of undergraduate and graduate students and practicing executives;
- develop and continuously improve programs advancing management education and practice; and,
- conduct world-class research enhancing cutting-edge management knowledge.

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The School creates enduring knowledge for a changing world. Grounded in research and experience, our educational programs provide the managerial and technical skills to address evolving business challenges.

Item #12QQ

DEGREES OFFERED

Master of Arts in International Management Studies (M.A.)
Master of Business Administration (MBA)
Master of Science in Accounting and Information Management (M.S.)
Master of Science in Information Technology and Management (M.S.)
Master of Science in Management and Administrative Sciences (M.S.)
Master of Science in Healthcare Management – Executive Track (M.S.)
Master of Science in Healthcare Management – Professional Track (M.S.)
Master of Science in Finance (M.S.)
Master of Science in Supply Chain Management (M.S.)

Doctor of Philosophy in International Management Studies (Ph.D.)
Doctor of Philosophy in Management Science (Ph.D.)

Project Management (Certificate)
Organizational Behavior and Coaching (Certificate)
Supply Chain Management (Certificate)
Sourcing (Certificate)
Product Lifecycle Management (Certificate)
Lean 6 Sigma (Certificate)
Business Intelligence and Data Mining (Certificate)

Healthcare Management (Certificate)

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Master of Science in Accounting and Information Management

Degree Requirements

The University's general degree requirements are discussed here.

At least 36 hours of the management course work beyond prerequisite courses is required, including 12 hours of basic business core courses and 24 hours of graduate accounting and information management courses. The M.S. in Accounting and Information Management degree is designed for students either with or without previous educational background in accounting and business. Within the M.S. in Accounting and Information Management degree program, the candidate may select one of seven concentrations based on their previous experience and future aspirations. Concentrations include (I) Financial Analysis, (II) Audit and Professional, (III) Taxation, (IV) Managerial, (V) Information Management, (VI) International Services, and (VII) Internal Audit. Students must maintain a 3.0 grade point average in both core courses and in aggregate to qualify for the M.S. in Accounting and Information Management degree.

Basic Business Core (12 credit hours)

Each candidate must satisfactorily complete the following three courses.
AIM 6344 Financial Statement Analysis
MECO 6303 Business Economics or FIN 6301 Financial Management
OPRE 6301 Quantitative Introduction to Risk and Uncertainty in Business

And complete one of the following two courses
AIM 6343 Accounting Information Systems
OPRE 6302 Operations Management

Accounting Foundation* (9 hours)

Each candidate must satisfactorily complete the following three accounting foundation courses:

AIM 6330 Intermediate Financial Accounting I
AIM 6332 Intermediate Financial Accounting II
AIM 6341 Planning, Control, and Performance Evaluation
* students that have already taken foundation courses (or their undergraduate equivalents) may replace them with AIM electives

(I) Financial Analysis Concentration (15 hours)

AIM 6333 Advanced Financial Reporting
AIM 6334 Auditing
AIM 6345 Business Valuation
AIM 6346 Financial Dimensions of Mergers and Acquisitions
AIM 6351 Individual Taxation

(II) Audit and Professional Concentration (15 hours)

AIM 6333 Advanced Financial Reporting
AIM 6334 Auditing

AIM 6351 Individual Taxation
AIM 6352 Corporate Taxation
AIM 6377 Corporate Governance and Accounting

(III) Taxation Concentration (15 hours)

AIM 6334 Auditing
AIM 6351 Individual Taxation
AIM 6352 Corporate Taxation
AIM 6354 Partnership Taxation
AIM 6356 Tax Research

(IV) Managerial Concentration (15 hours)

AIM 6333 Advanced Financial Reporting
AIM 6334 Auditing
AIM 6342 Strategic Cost Management
AIM 6347 Current Topics in Advanced Cost Management
AIM 6351 Individual Taxation

(V) Information Management Concentration* (15 hours)

AIM 6336 Information Technology Audit and Risk Management or AIM 6338 Integrated Accounting Information Systems Analysis and Design**
AIM 6347 Current Topics in Advanced Cost Management
AIM 6349 Information Technology Strategy and Management
AIM elective
AIM elective
* the IT security and Enterprise System course-sets can be followed in this concentration
** course not chosen may be used as elective

(VI) International Services Concentration (15 hours)

AIM 6342 Strategic Cost Management
AIM 6362 International Accounting
AIM 6377 Corporate Governance and Accounting
AIM elective
AIM elective

(VII) Internal Audit Concentration (15 hours)

AIM 6336 Information Technology Audit and Risk Management
AIM 6380 Internal Audit
AIM 6383 Forensic Accounting Investigations or AIM 6384 Analytical Reviews Using Audit Software
AIM guided elective**
AIM guided elective**
* course not chosen may be used as elective
** to be approved by Director of Endorsed Internal Audit Program

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Additional information about courses within each concentration may be obtained in the SOM advising office as well as information about the requirements for the CPA exam.

Master of Science in Biotechnology

Faculty

The following faculty members work with and teach students in the M.S. in Biotechnology degree program:

Professors: Larry P. Ammann (Mathematics), Ray H. Baughman (Chemistry), Lee A. Bulla (Molecular and Cell Biology), Santosh R. D'Mello (Molecular and Cell Biology), Rockford K. Draper (Molecular and Cell Biology), Sam Efromovich (Mathematics), Steven R. Goodman (Molecular and Cell Biology), Donald M. Gray (Molecular and Cell Biology), Donald A. Hicks (EPPS), M. Ali Hooshyar (Mathematics), Stephen D. Levene (Molecular and Cell Biology), Betty S. Pace (Molecular and Cell Biology), Lawrence J. Reitzer (Molecular and Cell Biology)
Associate Professors: Mark C. Anderson (SOM), Gregg R. Dieckmann (Chemistry), Gail A. Breen (Molecular and Cell Biology), Ovidiu Daescu (Computer Science), David L. Deeds (SOM), Ernest M. Hannig (Molecular and Cell biology), Warren J. Goux (Chemistry), Robert L. Kieschnick (SOM), J B Lee (Electrical Engineering), Dennis L. Miller (Molecular and Cell Biology), Paul Pantano (Chemistry)
Assistant Professors: Wenchuang Hu (Electrical Engineering), Jung-Mo Anh (Chemistry), Yan Cao (Mathematics), Pankaj K. Choudhary (Mathematics), Mieczyslaw K Dabkowski (Mathematics), Ying Liu (Computer Science), Nirup M. Menon (SOM)
Senior Lecturers: Joseph C. Picken (SOM), Robert L. Robb (SOM)

Objectives

The M.S. degree in biotechnology is intended to prepare students for careers in biotechnology and biomedicine and to assist currently employed professionals in enhancing their career opportunities.

Biotechnology captures the exciting possibilities made possible by the decoding of the human genome and by the advances in bioanalytical instrumentation, and the field is projected for rapid growth. The M.S. in Biotechnology is designed so that students may enter the program with a wide range of prior disciplinary backgrounds, prepare for and take the four core courses, and, by choice from a wide range of approved electives, tailor the remainder of the degree program to their career opportunities. In this manner, students may develop areas of additional depth in fields such as:

- molecular and cell biology
- chemistry
- engineering and computer science
- health care policy
- management and business administration

The M.S. in Biotechnology requires 36 hours of courses, typically twelve courses of three semester hours each. Students may also elect to prepare and defend a thesis; more than 36 hours may be required for such a program.

The M.S. in Biotechnology is administered by the Department of Molecular and Cell Biology. Students seeking further information or advisement should contact the Molecular and Cell Biology Department office.

Core Courses

The core consists of four courses – BIOL 5376 Applied Bioinformatics, or CS 6325 Introduction to Bioinformatics, BIOL 5381 Genomics, BIOL 6373 Proteomics, and BIOL 6384 Biotechnology Laboratory.

Students enrolled in the M.S. in Biotechnology M.S.program will have priority for enrollment in BIOL 6384. Students who can demonstrate that they have acquired the material and/or skills in a core course may petition the Committee on Biotechnology for permission to substitute an approved elective course.

Program Policies

The program is open to all students who hold a bachelors degree, although those with laboratory science, mathematics, computer science, or engineering degrees are particularly encouraged to apply. In general, students will not be admitted to the MS in Biotechnology program if they require more than two courses in order to be ready to take the core courses.

Every student admitted to the M.S. in Biotechnology program shall consult with the program advisor(s) and develop a mutually agreed degree plan. All requests for deviations from the degree program described in this catalog shall be discussed first with a program advisor, who will forward the request to the Committee on Biotechnology for decision.

There are no formal prerequisites for most of the core courses, and a student, after obtaining consent of the program advisor, may attempt one or more core courses. However, the level of the BIOL core courses is such that most students will want to have mastered the material in the following courses:

General Chemistry (two semesters, with lab)
Organic Chemistry (two semesters, with lab)
BIO 2311 Introduction to Modern Biology I (with workshop)
BIOL 3361 Biochemistry or BIOL 6352 Modern Biochemistry I
BIOL 3301 Classical and Molecular Genetics or BIOL 6V31 Molecular Genetics

The four core courses should be taken in the following order: BIOL 5376 Applied Bioinformatics, BIOL 5381 Genomics, BIOL 6373 Proteomics, BIOL 6384 Biotechnology Laboratory. Consent of instructor is required for core courses taken out of this sequence.

BIOL 6384 Biotechnology Laboratory is a skills based course. Students must show that they have adequate laboratory skills in order to enroll in BIOL 6384.

Also available are four 1-SCH summer preparatory courses for students who do not have the background in both biology and mathematics that is required for success in the core courses. Students with a strong math background, who need access to modern biology, should take BIOL 5V00-06A (Biology Preparation – MS in Biotechnology I), BIOL 5V00-06M (Biology Preparation – MS in Biotechnology II), and MATH 5V06-06M (Mathematics Preparation – MS in Biotechnology II). Students with a strong biology background, who need access to mathematics/statistics, should take MATH 5V06-06A (Mathematics Preparation – MS in Biotechnology I), BIOL 5V00-06M (Biology Preparation – MS in Biotechnology II), and MATH 5V06-06M (Mathematics Preparation – MS in Biotechnology II).

Students who elect to prepare and defend a thesis must satisfy the MS thesis procedures specified by the department of their thesis supervisor.

Electives

As a general rule, any UTD graduate course that is approved by the advisor as being relevant to the student's tailored degree plan may be taken as an elective for the Biotechnology M.S. program. Students should consult the program advisor for the current list of recommended electives.

A joint program in Bioinformatics and Computational Biology, administered through the Mathematical Sciences Department, is also available, and courses offered within that program are also available as electives.

Master of Science Program in Applied Cognition and Neuroscience

http://bbs.utdallas.edu//

Faculty

Professors: Hervé Abdi, Peter Assmann, James C. Bartlett, W. Jay Dowling, George M. Gerken (emeritus), Richard M. Golden, Susan W. Jerger, William F. Katz, Aage R. Møller, Alice O'Toole,
Associate Professors: Marco Atzori, Lawrence J. Cauller, Michael Kilgard, Lucien T. Thompson
Assistant Professors: Daniel Krawczyk, Christa McIntyre
Distinguished Scholar in Residence: James Jerger

Objectives

The Master of Science in Applied Cognition and Neuroscience (ACN) program is an applied multidisciplinary program which incorporates and integrates methodologies from such diverse fields as psychology, neuroscience, and computer science. The *Cognition and Neuroscience specialization area* provides a flexible multidisciplinary curriculum for studying the mind and brain which is designed to be adaptable to the individual student's interests. Students enrolling in the Cognition and Neuroscience specialization area with backgrounds in psychology and neuroscience will have the opportunity to gain the diverse skills needed to collect and interpret behavioral and neurophysiological data. The *Computational Modeling/Intelligent Systems specialization area* provides advanced training applicable to developing mathematical and computer simulation models of the brain and behavior as well as the development of artificially intelligent systems. The *Human Computer Interaction specialization area* provides excellent preparation for work in areas involving human computer interactions, such as usability engineering issues associated with the design and evaluation of user-friendly web-based systems. The *Neurological Diagnosis and Monitoring specialization area* provides advanced training and preparation for using functional brain imaging methodologies such as: EEG, SPECT, PET, and fMRI for both clinical and experimental investigations. All four specialization areas provide excellent preparation for doctoral work in the Cognition and Neuroscience area as well as medical school.

Career Opportunities

The Master of Science in Applied Cognition and Neuroscience (ACN) program is a multidisciplinary program which should be of interest to business professionals interested in retraining or continuing education and are currently working full-time in a professional-level job. Business professionals in different fields should pursue the appropriate 'specialization area' within the ACN degree program. Many courses in the ACN program are offered periodically as evening courses which meet either once or twice a week. A few representative career opportunities in the Applied Cognition and Neuroscience Area are listed as follows.

- Software development professionals, whose focus is the development of web sites, can acquire advanced training in the design and evaluation of web-site effectiveness using

advanced behavioral science methodologies through the *Human-Computer Interaction specialization area.*

Psychological counselors and Education professionals (e.g., high school science teachers, adult literacy educators) will greatly benefit from the basic neuroscience and psychological science courses offered in the *Cognition and Neuroscience specialization area.*

Medical Health professionals (e.g., Electroneurodiagnostic Technologists, MRI Technicians. Radiologists) who are working in the area of brain imaging technology will find the *Neurological Diagnosis and Monitoring specialization area* relevant for improving their knowledge and understanding of functional brain imaging technologies such as: EEG, SPECT, PET, and fMRI.

Software development professionals interested in the area of the implementation of complex mathematical algorithms in software. Such mathematical algorithms are now widely embedded in a variety of software programs for the purposes of providing "intelligent assistance" to the end-user. Software development professionals interested in continuing education in the area of artificial intelligence and artificial neural network modeling should consider the *Intelligent Systems specialization area* in the ACN program.

Facilities

In addition to numerous individual faculty research labs, the Applied Cognition and Neuroscience Program utilizes several facilities which are shared among faculty and graduate students in the School of Behavioral and Brain Sciences. The Computational Systems Laboratory consists of a network of workstations which are used for computationally intensive models of perceptual, cognitive, and neural processes as well as high-volume data analyses. The Computational Systems Laboratory can be accessed remotely by graduate students and faculty members. The Neuroscience Laboratory facilities are located in Green Hall and the Multipurpose Building at the Richardson campus as well. The Callier Center for Communication Disorders, located adjacent to the University of Texas Southwestern Medical School, provides access to brain imaging laboratories and speech, hearing, and language laboratories.

Admission Requirements

The University's general admission requirements are discussed here.

Admission to the Applied Cognition and Neuroscience Program is based on a review of the applicant's GPA, letters of recommendation, and narrative description of interests and career goals. Both GRE math and verbal scores are required to be considered for admission.

Students with strong academic records, who are in the process of completing their undergraduate degree at UTD, may be admitted as *Fast-track Students.* Fast-track students may accelerate completion of the degree requirements of the Master of Science Program in Applied Cognition and Neuroscience at UTD by completing up to 12 credits of specified fast-track graduate coursework at UTD as an undergraduate. Fast-track credit hours may be used to fulfill requirements for the student's undergraduate UTD degree as well as satisfy course requirements for the masters' degree in Applied Cognition and Neuroscience. Applications to the Graduate Program in Applied Cognition and Neuroscience can be submitted as soon as the student is an undergraduate at UTD with no more than 45 credit hours remaining.

Degree Requirements

The University's general degree requirements are discussed here.

All students in the program are required to regularly review their degree plans with their program advisor. In all areas of specialization students complete 6 hours of approved core courses, 6 hours of approved methods courses, 6 hours of approved advanced elective courses, 12 hours of coursework in an approved specialization area, and 6 hours of internship courses. A grade of "B" is the required passing grade for coursework used to fulfill the core course and methods course requirements of the degree. Coursework used to fulfill the advanced elective requirement may be taken pass/fail. Internship coursework must be taken pass/fail.

Required Core Courses (18 hours)

- *Select two of the following approved core courses (6 hours).*
  ACN 6330 Cognitive Science I
  ACN 6395 Cognitive Psychology
  ACN 6340 Cellular Neuroscience
  ACN 6344 Functional Human Neuroanatomy
  ACN 6346 Systems Neuroscience

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Select at least one approved quantitative methods course approved by the Program Head or from the following approved list of quantitative methods courses (3 hours).
ACN 6312 Research Methods in Behavioral and Brain Sciences – Part I
ACN 6313 Research Methods in Behavioral and Brain Sciences – Part II
ACN 6314 Research Methods in Behavioral and Brain Sciences – Part III
ACN 6351 Quantitative Methods in Neuroscience
ACN 6348 Neural Net Mathematics
ACN 6347 Intelligent Systems Analysis
ACN 6349 Intelligent Systems Design

Select at least one methods course (3 hours).

Select two advanced elective courses: These courses may be chosen from either the Graduate Program in Human Development and Communication Sciences or the Applied Cognition and Neuroscience Program or the courses may be chosen from outside the School of Behavioral and Brain Sciences with approval from the ACN program head. Advanced elective courses may be taken pass/fail or for a grade.

Area of Specialization (12 hours)

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The following four specialization areas have been approved for the Applied Cognition and Neuroscience program but alternative specialization area proposals may be submitted for consideration to the Applied Cognition and Neuroscience program head.

Cognition and Neuroscience Specialization Area

Students selecting this specialization area are approved to select any four courses from the ACN program (i.e., courses with the prefix ACN) or the Cognition and Neuroscience Area of the Graduate Program in Human Development and Communication Sciences (i.e., courses with the prefix HCS).

Human-Computer Interactions Specialization Area

Students selecting this specialization area should take two of the following three courses: ACN 6341 Human Computer Interactions I, ACN 6342 Human Computer Interactions II, and ACN 6343 Human

Computer Interactions Lab. Students pursuing the *behavioral sciences track* should additionally take two courses from the Cognition and Neuroscience Specialization Area course selections. Students pursuing the *user-interface development track* should take: CS 5343 Algorithm Analysis and Data Structures and CS 6354 Software Engineering. Note that the prerequisites for CS5343 are: CS5303 Computer Science I (or equivalent) and CS 5333 Discrete Structures. Students specializing in the Human Computer Interactions area should regularly review the Arts and Technology courses offered in the School of Arts and Humanities which have the course prefix ATEC and discuss relevant course offerings with the ACN Program Head.

Computational Modeling/Intelligent Systems Specialization Area

Students pursuing the *computer simulation modeling track* should take four courses from the Cognition and Neuroscience Specialization Area which include at least one of the following courses: ACN 7335 Computational Neuroscience, ACN 7367 Speech Perception Lab, ACN 6322 Computational Models of Language Understanding. Students pursuing the *mathematical modeling track* will satisfy the advanced elective requirement in this specialization area by taking the sequence: ACN 6346 Neural Net Mathematics, ACN 6347 Intelligent Systems Analysis and ACN 6349 Intelligent Systems Design and one additional course from the Cognition and Neuroscience Specialization Area course selection. Note that STAT 5351, linear algebra, multivariable calculus, and ACN 5314 Cognitive and Neural Modeling Lab are recommended prerequisites for: ACN 6346. The following Computer Science and Electrical Engineering courses are pre-approved electives for students specializing in the Intelligent Systems area who have the appropriate prerequisite background in computer science and/or electrical engineering: CS6320 (Natural Language Processing), CS 6321 (Discourse Processing), CS6364 (Artificial Intelligence), CS6373 (Intelligent Systems), CS6375 (Machine Learning), CS6384 (Computer Vision), EE6362 (Speech Processing), EE6363 (Digital Image Processing), EE6364 (Pattern Recognition), and EE 6365 (Adaptive Signal Processing).

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Neurological Diagnosis and Monitoring Specialization Area

Students should take ACN 6344 Functional Human Neuroanatomy and ACN 6346 Systems Neuroscience. Students should also choose at least 2 of the following courses as specialization area electives: ACN 6310 Fundamentals of Functional Brain Imaging, ACN 6373 Intraoperative Monitoring I, ACN 6374 Intraoperative Monitoring II, ACN 7315 Statistical Analysis of Brain Imaging Data, ACN 7329 Functional Brain Imaging Practica, ACN 6372 Pathophysiology of Disorders of the Nervous System, and ACN 7330 Advanced Functional Brain Imaging.

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Internships (6 hours)

The internship requirement is satisfied by enrolling in 6 credit hours of ACN 7V71 Industry Internship, ACN 7V72 Research Internship, and/or HCS 8V80 Research in HCS. Students whose immediate post-graduate goals are graduate school and medical school should fulfill the Internship Requirement by taking six credit hours of HCS 8V80 in order to obtain research experience. Students not intending to pursue graduate or medical school training immediately after receiving their ACN masters degree should discuss internship opportunities with the Program Head during their second semester of enrollment in the ACN program.

Materials Science and Engineering Course Descriptions

CORE COURSES

MSEN 5310 Thermodynamics of Materials (*3 semester hours*) Fundamental laws of thermodynamics, theory of solution, thermodynamic identities and their uses, chemical reactions, phase equilibria. Electrochemistry. Thermodynamics of modern materials, kinetics. (3-0) R

MSEN 5360 Materials Characterization (*3 semester hours*) Survey of atomic and structural analysis techniques as applied to surface and bulk materials. Physical processes involved in the interaction of ions, electrons and photons with solids; characteristics of the emergent radiation in relation to the structure and composition. (3-0) R

MSEN 6319 Quantum Mechanics for Materials Scientists (*3 semester hours*) Quantum-mechanical foundation for study of nanometer-scale materials. Principles of quantum physics, stationary-states for one-dimensional potentials, symmetry considerations, interaction with the electromagnetic radiation, scattering, reaction rate theory, spectroscopy, chemical bonding and molecular orbital theory, solids, perturbation theory, nuclear magnetic resonance. Prerequisite: EE 5300 or equivalent. (3-0) Y

MSEN 6324 (EE 6324) Electronic, Optical and Magnetic Materials (*3 semester hours*) Foundations of materials properties for electronic, optical and magnetic applications. Electrical and Thermal Conduction, Elementary Quantum Physics, Modern Theory of Solids, Semiconductors and Devices, Dielectrics, Magnetic and Optical Materials properties. Prerequisite: MSEN 5300 or equivalent. (3-0) T

ADVANCED COURSE LIST

MSEN 5340 Advanced Polymer Science and Engineering (*3 semester hours*) Polymer structure-property relations, Linear and nonlinear viscoelasticity. Dynamic mechanical analysis, time-temperature superposition, creep and stress relaxation. Mechanical models for prediction of polymer deformation, rubber elasticity, environmental effects on polymer deformation, instrumentation for prediction of long term properties. (3-0) R.

MSEN 5370 Ceramics and Metals (*3 semester hours*) Emphasis on structure-property relationships: chemical bonding, crystal structures, crystal chemistry, electrical properties, thermal behavior, defect chemistry. Chemical and physical properties of metals and alloys. Topics include: powder preparation, sol-gel synthesis, densification, toughening mechanisms, crystal structure, thermodynamics, phase diagrams, phase transformations, oxidation, mechanical, electrical and magnetic properties. (3-0) R

MSEN 5377 (PHYS 5377) Computational Physics of Nanomaterials (*3 semester hours*) This course introduces atomistic and quantum simulation methods and their applications to modeling study nanomaterials (nanoparticles, nanowires, and thin films). The course has three main parts: basic theory of materials (thermodynamics, statistical mechanics, and solid state physics), computational methods to model materials systems, and applications to practical problems. There are three main themes of the course: structure-property relationship of nanomaterials; atomistic modeling for atomic structure optimization; and quantum simulations for electronic structure study and functional property analysis. (3-0) R

MSEN 6310 (MECH 6301) Mechanical Properties of Materials (*3 semester hours*) Phenomenology of mechanical behavior of materials at the macroscopic level and the relationship of mechanical behavior to material structure and mechanisms of deformation and failure. Topics covered include elasticity, viscoelasticity, plasticity, creep, fracture, and fatigue. (3-0) Y

MSEN 6330 Phase Transformations (*3 semester hours*) Thermodynamic, diffusion processes, kinetic, and structural aspects of metallic phase transformations: surface energy and interfaces, solidification, diffusionless phase transformation, mechanisms and rate-determining factors in oxidation and thin film

deposition; nucleation theory, precipitations from solid solution, order-disorder phenomena, and applications of phase diagrams. (3-0) R

MSEN 6350 Imperfections in Solids (*3 semester hours*) Point defects in semiconductors, metals, ceramics, and nonideal defect structures; nonequilibrium conditions produced by irradiation or quenching; effects of defects on electrical and physical properties, effects of defects at interfaces between differing materials. (3-0) R

MSEN 6377 (PHYS 6377) Physics of Nanostructures: Carbon Nanotubes, Fullerenes, Quantum Wells, Dots and Wires (*3 semester hours*) Electronic bands in low dimensions. 0-d systems: fullerenes and quantum dots. Optical properties, superconductivity and ferromagnetism of fullerides. 1-d systems: nano-wires and carbon nanotubes (CNTs). Energy bands of CNTs: chirality and electronic spectrum. Metallic versus semiconducting CNT: arm-chair, zigzag and chiral tubes. Electrical conductivity and superconductivity of CNTs, thermopower. Electromechanics of SWCNT: artificial muscles. Quantum wells, FETs and organic superlattices: confinement of electrons and excitons. Integer and fractional quantum Hall effect (QHE). (3-0) R

SPECIALIZED COURSE LIST

MSEN 5300 (PHYS 5376) Introduction to Materials Science and Engineering (*3 semester hours*) This course provides an intensive overview of materials science and engineering and includes the foundations required for further graduate study in the field. Topics include atomic structure, crystalline solids, defects, failure mechanisms, phase diagrams and transformations, metal alloys, ceramics, polymers as well as their thermal, electrical, magnetic and optical properties. (3-0) R.

MSEN 5331 (CHEM 5331) Advanced Organic Chemistry I (*3 semester hours*) Modern concepts of bonding and structure in covalent compounds. Static and dynamic stereochemistry and methods for study. Relationships between structure and reactivity. Prerequisite: CHEM 2325 or equivalent. (3-0) Y

MSEN 5333 (CHEM 5333) Advanced Organic Chemistry II *(3 semester hours)* Application of the principles introduced in CHEM 5331, emphasizing their use in correlating the large body of synthetic/preparative organic chemistry. Prerequisite: MSEN 5331/CHEM 5331. (3-0) R

MSEN 5341 (CHEM 5341) Advanced Inorganic Chemistry (3 semester hours) Physical inorganic chemistry addressing topics in structure and bonding, symmetry, acids and bases, coordination chemistry and spectroscopy. Prerequisite: CHEM 3341, or consent of instructor. (3-0) Y.

MSEN 5344 Thermal Analysis *(3 semester hours)* Differential scanning calorimetry; thermogravimetric analysis; dynamic mechanical and thermomechanical analysis; glass transition; melting transitions, relaxations in the glassy state, liquid crystalline phase changes. (3-0) S

MSEN 5353 Integrated Circuit Packaging (*3 semester hours*) Basic packaging concepts, materials, fabrication, testing, and reliability, as well as the basics of electrical, thermal, and mechanical considerations as required for the design and manufacturing of microelectronics packaging. Current requirements and future trends will be presented. General review of analytical techniques used in the evaluation and failure analysis of microelectronic packages. (3-0) R

MSEN 5355 (CHEM 5355) Analytical Techniques I (*3 semester hours*) Study of fundamental analytical techniques, including optical spectroscopic techniques and energetic particle and x-ray methods including SEM, EDS, STM, AFM, AES, XPS, XRF, and SIMS. (3-0) Y

MSEN 5356 (CHEM 5356) Analytical Techniques II (*3 semester hours*) Study of statistical methods (standard tests, statistical process control, ANOVA, experimental design, etc.) and problem solving

techniques for dealing with ill-defined analytical problems. Prerequisite: CHEM 5355 or MSEN 5355 or consent of instructor. (3-0) Y

MSEN 5361 Fundamentals of Surface and Thin Film Analysis (*3 semester hours*) Survey of materials characterization techniques; Rutherford backscattering; secondary ion mass spectroscopy; ion channeling; scanning tunneling and transmission microscopy; x-ray photoerlctron and Auger electron spectroscopy; x-ray and electron diffraction. (3-0) R

MSEN 5371 (PHYS 5371) Solid State Physics *(3 semester hours)* Symmetry description of crystals, bonding, properties of metals, electronic band theory, thermal properties, lattice vibration, elementary properties of semiconductors. Prerequisites: PHYS 5400 and 5421 or equivalent. (3-0) Y

MSEN 5375 (PHYS 5375) Electronic Devices Based On Organic Solids (*3 semester hours*) Solid state device physics based on organic condensed matter structures, including: OLEDs (organic light emitting diodes), organic FETs, organic lasers, plastic photocells, molecular electronic chips. (3-0) R

MSEN 5383 (PHYS 5383 and EE 5383) Plasma Technology (*3 semester hours*) Hardware oriented study of useful laboratory plasmas. Topics will include vacuum technology, gas kinetic theory, basic plasma theory and an introduction to the uses of plasmas in various industries. (3-0) Y

MSEN 5410 (BIOL 5410) Biochemistry of Proteins and Nucleic Acids *(4 semester hours)* Chemistry and metabolism of amino acids and nucleotides; biosynthesis of nucleic acids; analysis of the structure and function of proteins and nucleic acids and of their interactions including chromatin structure. Prerequisite: biochemistry or equivalent. (4-0) Y

MSEN 5440 (BIOL 5440) Cell Biology *(4 semester hours)* Molecular architecture and function of cells and subcellular organelles; structure and function of membranes; hormone and neurotransmitter action; growth regulation and oncogenes; immune response; eukaryotic gene expression. Prerequisites: BIOL 5410 and BIOL 5420, or the equivalent, or permission of the instructor. (4-0) Y

MSEN 6313 (EE 6313) Semiconductor Opto-Electronic Devices (*3 semester hours*) Physical principles of semiconductor optoelectronic devices: optical properties of semiconductors, optical gain and absorption, wave guiding, laser oscillation in semiconductors; LEDs, physics of detectors, applications. Prerequisite: EE 3310 or equivalent. (3-0) T

MSEN 6320 (EE 6320) Fundamentals of Semiconductor Devices (3 semester hours) Semiconductor material properties, band structure, equilibrium carrier distributions, non-equilibrium current-transport processes, and recombination-generation processes. Prerequisite: EE 6319 or equivalent. (3-0) Y

MSEN 6321 (EE 6321) Active Semiconductor Devices (*3 semester hours*) The physics of operation of active devices will be examined, including bipolar junction transistors and field-effect transistors: MOSFETs, JFETS, and MESFETS. Special-purpose MOS devices including memories and imagers will be presented. Prerequisite: EE 6320. (3-0) Y

MSEN 6322 (EE 6322, MECH 6322) Semiconductor Processing Technology (*3 semester hours*) Modern techniques for the manufacture of semiconductor devices and circuits. Techniques for both silicon and compound semiconductor processing are studied as well as an introduction to the design of experiments. Topics include: wafer growth, oxidation, diffusion, ion implantation, lithography, etch and deposition. (3-0) T

MSEN 6340 Advanced Electron Microscopy (*3 semester hours*) Theory and applications of scanning and transmission electron microscopy; sample preparation, ion beam and analytical techniques. (3-0) Y

MSEN 6341 Advanced Electron Microscopy Laboratory (*3 semester hours*) Lab support for MSEN 6340. (0-3) Y

MSEN 6358 (BIOL 6358) Bionanotechnology *(3 semester hours)* Protein, nucleic acid and lipid structures. Macromolecules as structural and functional units of the intact cell. Parallels between biology and nanotechnology. Applications of nanotechnology to biological systems. (3-0) Y

MSEN 6361 (MECH 6361) Deformation Mechanisms in Solid Materials (*3 semester hours*) Linear elastic fracture mechanics, elastic-plastic fracture mechanics, time dependent failure, creep and fatigue, experimental analysis of fracture, fracture and failure of metals, ceramics, polymers and composites. Failure analysis related to material, product design, manufacturing and product application. Pre-requisites: MSEN 5300 or MECH 6301/MSEN 6310. (3-0) Y

MSEN 6362 Diffraction Science (*3 semester hours*) Structure of materials: cryatal, amorphous, liquid crystals, Diffraction theory; scattering and diffraction experiments; x-ray topography; X-ray camera including XRD, textured structures, crystal structure analysis; disordered crystals; quasi-crystals. (3-0) S

MSEN 6371 (PHYS 6371) Advanced Solid State Physics *(3 semester hours)* Continuation of MSEN 5371/PHYS 5371, transport properties of semiconductors, ferroelectricity and structural phase transitions, magnetism, superconductivity, quantum devices, surfaces. Prerequisite: MSEN 5371/PHYS 5371 or equivalent. (3-0) R

MSEN 6374 (PHYS 6374) Optical Properties of Solids (*3 semester hours*) Optical response in solids and its applications. Lorentz, Drude and quantum mechanical models for dielectric response function. Kramers-Kronig transformation and sum rules considered. Basic properties related to band structure effects, excitons and other excitations. Experimental techniques including reflectance, absorption, modulated reflectance, Raman scattering. Prerequisite: MSEN 5371/PHYS 5371 or equivalent. (3-0) T

MSEN 7320 (EE 7320) Advanced Semiconductor Device Theory (*3 semester hours*) Quantum mechanical description of fundamental semiconductor devices; carrier transport on the submicron scale; heterostructure devices; quantum-effect devices. Prerequisite: EE 6320. (3-0) R

MSEN 7382 Introduction to MEMS (*3 semester hours*) Study of fabrication techniques for micro-electro-mechanical and micro-opto-mechanical devices and systems and their applications. Techniques for both silicon, non-silicon processing and emerging new micromachining processes are studied as well as their process physics. Topics to include: bulk and surface micromachining, electroplating-based micromachining and micro devices packaging. (3-0) Y

MSEN 7V80 Special Topics in Materials Science and Engineering (1-6 semester hours) For letter grade credit only. (May be repeated to a maximum of 9 hours.) ([1-6]-0) S

MSEN 8V40 Individual Instruction in Materials Science and Engineering (1-6 semester hours) (May be repeated for credit.) For pass/fail credit only. ([1-6]-0) R

MSEN 8V70 Research In Materials Science and Engineering (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) R

MSEN 8V98 Thesis (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

MSEN 8V99 Dissertation (3-9 semester hours) (May be repeated for credit.) For pass/fail credit only. ([3-9]-0) S

Doctor of Philosophy in Economics

http://www.utdallas.edu/epps/eco/

Faculty

Professors: Daniel G. Arce M., Kurt J. Beron, Rachel Croson, Catherine Eckel, James Murdoch, Todd Sandler, Barry J. Seldon, Donggyu Sul
Associate Professors:, Nathan Berg, Susan Williams McElroy, Kevin Siqueira
Assistant Professors: Rodney Andrews, Chetan Dave, Xin (Sherry) Li

Mission

The mission of the Ph.D. in Economics is to provide a cutting-edge education in economic theory, the development of a rigorous toolkit of mathematical and econometric techniques, and in various research areas in economics. This education allows students to think critically about how to approach the analysis of economic problems and to contribute to the knowledge base of the discipline

Facilities

Students have access to the computing facilities in the School of Economic, Political and Policy Sciences and the University's Computing Center. The School has two computing laboratories which have over 50 computers that are network linked and equipped with major social science software packages, including E-Views, R, Rats, SPSS and STATA. A computerized geographic information system, the Lexis Nexis Database, and WestLaw are also available for student use. The University's Computing Center provides personal computers and UNIX Workstations. Many important data and reference materials are also available online via the library's and school's memberships in numerous organizations.

Admission Requirements

The University's general admission requirements are discussed here.

Applicants will be judged and evaluated by the existing admission standards as set forth by the University in its Graduate Catalog. These standards include a bachelor's degree from an accredited institution or its equivalent, fluency in written and spoken English, a grade average of 3.25 or better in upper-division and graduate course work in economics and related courses, submission of official Graduate Record Examination (GRE) scores: GRE scores in the verbal and quantitative components of the exams should total to at least 1200. Students may also wish to consider submitting their score from the writing component of the GRE test as additional evidence of their writing skills. A score of at least 4.5 in analytical writing is considered desirable.

Standardized tests scores are only one of the factors taken into account in determining admission. Given the demands that will be placed on the student in his/her study of economics, a strong background in calculus, linear algebra, and mathematical statistics is highly desirable.

Students should submit all transcripts, three letters of recommendation, and a one-page essay outlining the applicant's background, education, and personal objectives.

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Item #12VV

Prerequisites

Students who lack the necessary background to start the program are advised to take courses at the School of Economic, Political and Policy Sciences to strengthen their preparation, but they will not receive credit towards their Ph.D. program. The following courses may be used to gain the prerequisite knowledge (i) ECON 3310 Intermediate Microeconomics; (ii) ECON 3311 Intermediate Macroeconomics; (iii) ECON 4351 Mathematical Economics; (iv) EPPS 7316 Advanced Regression Analysis or ECON 4355 Econometrics; (v) EPPS 7313 Basic and Inferential Statistics or equivalent. It is also necessary to have had undergraduate courses in calculus and matrix or linear algebra. Additional math courses, such as differential equations, mathematical statistics and real analysis, are useful.

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Degree Requirements

The University's general degree requirements are discussed here.

Students seeking the Ph.D. in Economics must (i) complete core courses with an average GPA of 3.00; (ii) pass comprehensive exams in micro- and macroeconomic theory and in econometrics (although the econometrics exam will be waived for students who complete each of the required econometrics courses with a grade of A- or better); (iii) be certified in two research areas within the science of Economics; and (iv) submit an approved dissertation. The following paragraphs elaborate on these requirements.

Students are required to complete the following core courses:

ECON 6301 Microeconomics Theory I
ECON 7301 Microeconomics Theory II
ECON 8301 Microeconomics Theory III
ECON 6302 Macroeconomics Theory I
ECON 7302 Macroeconomics Theory II
ECON 6305 Mathematical Economics
ECON 6311 Statistics for Econometrics
ECON 6309 Econometrics I
ECON 7309 Econometrics II
ECON 8309 Econometrics III

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In addition, they are required to register for the following courses at the appropriate stages of their study:
ECON 7V01 Survey/Research Seminar
ECON 8V01 Dissertation Seminar

In order to assure that the student progresses satisfactorily, each student is required to consult with the Director of Graduate Studies (DGS) of Economics Programs prior to registration in every semester.

For research area certification, the student must select the two research areas, preferably during the second year of study, and advise the (DGS) of the selection. The DGS will, in conjunction with the Economics Curriculum Committee, advise the student regarding the appropriate certification requirements. The general guidelines for certification consist of (i) making a grade of B or better in three courses within each area; (ii) writing an acceptable research paper in one area.

The submission of an approved dissertation will complete the course of study for the Ph.D. degree in Economics. The procedure for approval of the dissertation is outlined in the U.T.Dallas Graduate Catalog. See Graduate Registration Requirements.

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School of Arts and Humanities

The School of Arts and Humanities offers five graduate degree programs: Arts and Technology, Emerging Media and Communication, History, Humanities, and Latin American Studies.

Graduate Program in Arts and Technology (M.A., M.F.A.)

The interdisciplinary Graduate Program in Arts and Technology focuses on the creation, application, and implications of technologically sophisticated interactive communication. Students may focus on either Games and Interactive Narrative or Digital Arts and Design.

Graduate Program in Emerging Media and Communications (M.A.)

The interdisciplinary Graduate Program in Emerging Media and Communication focuses on ways in which digital technology is transforming the dissemination of information and art. The program enables students to analyze, employ and produce technologically mediated communication.

Graduate Program in History (M.A.)

The Graduate Program in History fosters advanced understanding of the processes by which interpretations of the past are made, disseminated and evaluated.

Graduate Program in the Humanities (M.A., M.A.T., Ph.D.)

The interdisciplinary Graduate Program in Humanities fosters integrated study and practice of the arts, literature, history, and philosophy. Combining the activities of established disciplines in the arts and humanities into one enterprise, the program enables students to take a broad view of human achievement in these areas.

Graduate Program in Latin American Studies (M.A.)

The interdisciplinary program in Latin American Studies allows students to acquire expertise in multiple aspects of Latin America. The curriculum connects literary, historical, cultural, and visual studies.

DEGREES OFFERED

Master of Arts in Arts and Technology
Master of Fine Arts in Arts and Technology

Master of Arts in Emerging Media and Communication

Master of Arts in History

Master of Arts in Humanities
Master of Arts in Humanities Major in Aesthetic Studies
Master of Arts in Humanities Major in History of Ideas
Master of Arts in Humanities Major in Studies in Literature

Master of Arts in Teaching in Humanities Major in Aesthetic Studies
Master of Arts in Teaching in Humanities Major in History of Ideas
Master of Arts in Teaching in Humanities Major in Studies in Literature

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Doctor of Philosophy in Humanities
Doctor of Philosophy in Humanities Major in Aesthetic Studies
Doctor of Philosophy in Humanities Major in History of Ideas
Doctor of Philosophy in Humanities Major in Studies in Literature

Certificate in Holocaust Studies

Master of Arts in Latin American Studies

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Item #12XX

New Program Request Form for Bachelor's and Master's Degrees

Directions: An institution shall use this form to propose a new bachelor's or master's degree program. In completing the form, the institution should refer to the document *Standards for Bachelor's and Master's Programs,* which prescribes specific requirements for new degree programs. Note: This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval, and (3) if applicable, a member of the Board of Regents or (designee), certifying that criteria have been met for staff-level approval. Note: An institution which does not have preliminary authority for the proposed program shall submit a separate request for preliminary authority. That request shall address criteria set in Coordinating Board rules Section 5.24 (a).

Information: Contact the Division of Academic Affairs and Research at 512/427-6200 for more information.

Administrative Information

1. Institution: **The University of Texas at Dallas**

2. Program Name – Show how the program would appear on the Coordinating Board's program inventory (*e.g., Bachelor of Business Administration degree with a major in Accounting*):

Master of Science in Systems Engineering & Management

3. Proposed CIP Code: 14.2701, Systems Engineering

4. Brief Program Description – Describe the program and the educational objectives:

The current business environment requires that engineers in industry and government be trained to be good managers and leaders, and to be good stewards of corporate or government resources. Conversely, managers in industry need a better appreciation and understanding of technology and how to manage large and complex engineering projects. They are all also expected to be cognizant of the broader impact of their management and engineering activities on their companies and the society at large.

Traditional areas of study in engineering have involved the study of "small" systems – micro-, nano-, info-, and bio- systems. However, there has over the years been a large and growing unmet need, as evidenced by discussions with our industry partners at Texas Instruments, Raytheon, EDS-HP, Rockwell and others, as well as, presentations at conferences, such as those organized by the MIT Enterprise Systems Division, June 15th 2009, for formalized education in engineering and management of increasingly complex "macro" systems with a large number of inter-dependent parts that have a very significant organizational or societal impact. These

areas are at the intersection of the traditionally separate disciplines of engineering and management.

According to the National Center for Education Statistics, which defines the national Classification of Instructional Programs (CIP) codes, Systems Engineering is a "program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of total systems solutions to a wide variety of engineering problems, including the integration of human, physical, energy, communications, management, and information requirements as needed, and the application of requisite analytical methods to specific situations."[1] The International Council on Systems Engineering (INCOSE) provides further detail on the difference between systems engineering and traditional specialty engineering: "Systems engineering is concerned with the overall process of defining, developing, operating, maintaining, and ultimately replacing quality systems. Where other engineering disciplines concentrate on the details of individual aspects of a system (electronics, mechanics, ergonometric, aerodynamics, software, etc.), systems engineering is concerned with the integration of all of these aspects into a coherent and effective system. Systems engineers concentrate their efforts on the aspects of the engineering process (requirements definition, top-level functional designs, project management, life cycle cost analysis...) that serve to organize and coordinate other engineering activities. The systems engineer is the primary interface between management, customers, suppliers, and specialty engineers in the systems development process."[2]

The need for systems engineers has come to the attention of the national press. A 2008 article on the aging systems engineering workforce commented that systems engineering involves "accurately assessing at the outset whether the technological goals are attainable and affordable, then managing the engineering to ensure that hardware and software are properly designed, tested and integrated", and goes on to say, "Without [systems engineering], projects can turn into chaotic, costly failures."[3]

The objective of the UT Dallas Master of Science degree program in Systems Engineering & Management (MS in SEM) is to produce graduates who will be capable of undertaking challenging projects that will encompass wide ranging scientific, engineering and management disciplines. In other words, the objective of the program is to develop an "integrated systems engineering and systems management" skill set among the students who go through this program.

This program is targeted towards engineers with a number of years of industry experience, as well as towards graduates with a fresh bachelor's degree.

The MS in SEM degree will require a total of 36 credit hours consisting of 12 courses in the non-thesis option or 10 courses plus 6 hours of thesis credit for the thesis option.

[1] National Center for Education Statistics, http://nces.ed.gov/ipeds/cipcode/cipdetail.aspx?y=55&cip=14.2701

[2] International Council on Systems Engineering, http://www.incose.org/educationcareers/careersinsystemseng.aspx

[3] Philip Taubman, "Top Engineers Shun Military; Concern Grows," New York Times, June 25, 2008.

The program being proposed here has enough flexibility built into it to accommodate different backgrounds among incoming students, allowing students to pick up areas in which they are deficient, while still guaranteeing core competency in systems engineering and engineering management.

Course Requirements (see Table 3 page 8)

Required Courses: Students will be required to take at least 4 courses (a total of 12 credit hours) from an offered set of 8 courses in Systems Engineering (SYSM). Two of the courses must be from IA and two from IB in Table 3. Thus the 4 required courses contribute a total of 12 credit hours towards the MS degree.

Prescribed Elective Courses will consist of an additional 4 distinct courses (a total of 12 credit hours) from a core set of 20 courses (Table 3), which have not already been taken towards the required 4 courses. At least two of these courses must be chosen from either IA or IIA in Table 3.

Free Elective Courses: For the free electives students will be able to take any 4 additional and distinct courses of the remaining 12 core courses that have not already been taken as required courses or prescribed elective courses. Students will also be able to take additional free elective courses that are already being offered in management or in engineering that will allow "concentration" or "specialization" in specific industry sectors.

5. Administrative Unit – Identify where the program would fit within the organizational structure of the university (e.g., The Department of Electrical Engineering within the College of Engineering):

A joint program between

The Erik Jonsson School of Engineering and Computer Science (ECS), and

The School of Management (SOM)

6. Proposed Implementation Date – Report the first semester and year that students would enter the program:

Fall Semester 2010

7. Contact Person(s) – Provide contact information for the person who can answer specific questions about the program:

Name: Dr. Mark W. Spong
Title: Dean, ECS
E-mail: mspong@utdallas.edu
Phone: 972-883-2974

Dr. Hasan Pirkul
Dean, SOM
hpirkul@utdallas.edu
972-883-6813

Program Information

I. Need

Note: Complete I.A and I.B only if preliminary authority for the program was granted more than four years ago. This includes programs for which the institution was granted broad preliminary authority for the discipline.

A. Job Market Need – Provide short- and long-term evidence of the need for graduates in the job market.

Systems Engineering & Management (SEM) is an interdisciplinary field between Engineering and Management that focuses on the engineering & management of complex engineering projects. For large, complex projects, SEM deals with issues such as automatic control of machinery, logistics and the coordination of different teams, work processes and tools to handle such projects. It overlaps with both technical and human centered disciplines, such as Control Engineering and Project Management.

Data compiled by the Greater Dallas Chamber of Commerce (GDC), and the Texas Workforce Commission (TxWFC) in 2007 across various High-tech Sectors that are relevant to SEM, excluding the Defense, Energy and Healthcare Sectors, indicates an engineering population in the DFW Metroplex well in excess of 200,000. Even if 5 % of these engineers are conservatively assumed to be Systems Engineers that translates to about 10,000. Again, if we were to conservatively assume that these 10,000 professionals renew their skills every 10 years, which creates a potential Total Available Market (TAM) of 1000 engineers and managers every year that would need SEM training every year in the DFW area alone. Of this population of engineers, the MS SEM Program is targeted towards engineers with 4 to 5 years of experience.

Again, using the GDC and TxWFC data, DFW area represents about 40 % of the state's high-tech population, not including the defense, energy and healthcare sectors, significantly larger than any other city in the state. DFW area is already the 4th largest in the country by population and GDP. It is also home to the headquarters of about 25 large corporations, and also home to major divisions of a large number of companies not head-quartered in the region. Cumulative job growth, as well as population growth in the DFW area, over the next 10 years, is expected to be twice the national average.

Also according to the Bureau of Labor Statistics (BLS) and the American Electronics Association (AeA) – "Contrary to the hype about rampant outsourcing, high-tech has many job openings, as demonstrated by the BLS's 2.5 % unemployment rate for computer scientists and under 2% for engineers."[1]

While interests in this new discipline have been verified in discussions with local companies – TI, EDS-HP, Raytheon, Rockwell and others – along with an initial interest in potential commitment of employees to send through this program, specific hard numbers to indicate potential future job market for this discipline are provided above.

[1] *William T. Archey, President& CEO, American Electronics Association (AeA), April 24, 2007, Cyberstates 2007.*

Because the field of Systems Engineering & Management comprises a wide range of engineering disciplines, it potentially represents a large portion of the engineering population. The graduates of the UT Dallas SEM program will be employed by large corporations in various industries, and to mention just a few examples – defense, aerospace, and space systems; transportation; telecom and computers networks and systems integration and services; semiconductors and electronics; healthcare systems; sustainable and intelligent energy systems; etc.

B. Student Demand – Provide short- and long-term evidence of demand for the program.

The American Society for Engineering Education reports that the Master's enrollment in industrial and manufacturing engineering grew steadily from around 5,000 in 1999 to more than 6,300 in 2008.[4] Based upon the assumption that many industrial engineering students have a systems focus, student demand for systems engineering and closely related fields is growing at a slower rate than will probably be necessary for replacement of engineers who are now nearing retirement age. However, student demand is a trailing, not a leading, indicator of perceived job opportunities.

Several local industry representatives have been contacted and subsequently confirmed their interest in this program. Sample letters of support from some of those representatives are included in Appendix 1.

Also, over the last several years, SMU and other local universities began offering engineering-only focused courses. SMU offers an MS in Systems Engineering. No programs in the North Texas Region exist that combine systems engineering and systems management, leveraging the strengths of both the School of Engineering and the School of Management, except perhaps a dual-track program in MS Engineering Systems (MSES) and MBA launched in May 2009 by the University of North Texas (UNT) or the UNT MS in Engineering Systems program that has a 15-hour management curriculum offered at their home campus and at the Collin Higher Education Center in McKinney; however, this program is a traditional engineering technology program. Similarly, the Systems Engineering programs offered by SMU and UT Austin are offered only through their engineering schools and do not provide any business education.

A summary chart of data from the Coordinating Board's PREP online database comparing programs from other Texas schools that could even remotely be considered similar to the proposed UTD Program is provided below, showing significant interest in this general area.

				Declared Majors				Degrees Awarded		
	Institution	**Program Name**	**CIP Code**	**2005**	**2006**	**2007**	**2008**	**05-'06**	**06-'07**	**07-'08**
1	Tx A&M	Industrial Engineering	14350100	441	548	621	755	42	42	57
2	Tx Tech	Engineering Management	14999901	32	27	48	58	11	18	12
3	UT Arlington	Engineering Management	14999901	28	29	33	31	10	9	12
4	UT Austin	Engineering Management	14999901	-	-	-	-	33	20	34
5	UT Pan Am	Engineering Management	14999901	-	-	10	14	-	1	2

[4] *Profiles of Engineering Colleges*, American Society for Engineering Education, 2009

6	Lamar U	Engineering Management	14999901	5	8	2	1	1	3	1
7	U of H	Ops Mgmt & Supervision	52020500	211	209	226	282	121	75	86
8	UNT	Engineering Technology	15000000	53	34	38	32	7	9	7

The highly popular program at Texas A&M is in the area of Industrial Engineering, which might be thought of as a subset of the Systems Engineering & Management Program being proposed by UTD. The Texas A&M program, while highly popular, is offered only out of the engineering school and does not include any management disciplines that are so crucial in the mid- to upper- management of large projects.

The same is true of the Engineering Management degrees offered by Texas Tech, UT Arlington, UT Pan American and Lamar University – all offered entirely out of schools of engineering. This is true also of the traditional Engineering Technology program offered by the University of North Texas. The degree offered by UT Austin, is out of the Engineering School also, but does incorporate some business oriented courses.

The degree offered by the University of Houston is in the area of Operations Management and Supervision, which again could be thought of as a subset of the broad area of Systems Engineering and Management. Also, the program is offered entirely out of the Business School, with no engineering involvement.

The UTD proposed program will be unique in that, both advanced engineering and advanced management education will be provided together in MS in SEM, leveraging the strengths of two very quantitatively strong and highly ranked programs in the Schools of Management and Engineering. Students will not be required to pursue an MBA to get the complementary business education. The program is unique in that it is a true 50/50 collaboration between the two schools.

C. Enrollment Projections – Use this table to show the estimated cumulative headcount and full-time student equivalent (FTSE) enrollment for the first five years of the program. (*Include majors only and consider attrition and graduation*.)
Based upon strong interests expressed by a number of area companies such as Texas Instruments, Rockwell, Raytheon, EDS-HP and other members of the SOM and ECS Advisory Boards, we expect to have a commitment from these companies to send students through the program at any given point in time. These discussions suggest the following progression for enrollment:.

Table - 1(#)

Year	1	2	3	4	5
Headcount	20	45	55	65	75
FTSE	15	30	45	55	60

(#) Table-1 assumes, students graduating in 2 years and attrition rate of 10 %. This attrition is anticipated to be primarily due to industry participants in the program

moving elsewhere, since these are expected to be senior, as well high-performing people in member companies.

II. Quality

A. **Degree Requirements** – Use this table to show the degree requirements of the program. *(Modify the table as needed; if necessary replicate the table for more than one option.)*

1. **Course Requirements:** The MS in SEM degree (non-thesis option) will require a total of *12 courses for a total of 36 credit hours*.

Table – 2 SEM Non-Thesis Option Degree Requirements

Category	Semester Credit Hours	Clock Hours
General Education Core Curriculum *(bachelor's degree only)*	N/A	
Required Courses	12	
Prescribed Electives	12	
Free Electives	12	
Other *(Specify, e.g., internships, clinical work)*	(if not included above)	
TOTAL	36	

2. **Thesis Option:** An alternative to 36 credit hours required for the MS SEM degree, would be to take 30 credit hours of courses and, in addition, write a Master's Thesis, in lieu of the remaining 6 credit hours.

B. **Curriculum** – Use these tables to identify the required courses and prescribed electives of the program. Note with an asterisk (*) courses that would be added if the program is approved. *(Add and delete rows as needed. If applicable, replicate the tables for different tracks/options.)*

Again, the program being proposed here has enough flexibility built into it to accommodate different backgrounds among incoming students, allowing students to choose areas in which they are deficient, rather than having them all go through a prescribed set of courses.

The Core Curriculum will consist of 20 Courses **(Table - 3)**.

1. All Courses listed below are 3 credit hours each

2. Courses with (*) are new courses
3. All non-asterisked courses already exist and are being offered under other prefixes.
4. Students who have taken other existing courses with other prefixes will be allowed to transfer to this program.

Table - 3

Prefix & Number	Core Curriculum	Credit
IA		
SYSM6301	Systems Engineering Architecture & Design (*)	3
SYSM6302	Quantitative Risk, Probability, Stochastic Processes	3
SYSM6303	Systems Engineering Risk & Decision Analysis	3
SYSM6304	Dynamic Systems Modeling & Analysis (*)	3
IB		
SYSM6305	Systems Project Management	3
SYSM6306	Engineering Economics	3
SYSM6307	Human Factors in Complex Organizations	3
SYSM6308	Manufacturing and Service Systems Planning and Analysis	3
IIA		
SYSM6309	Dynamics of Complex Structures	3
SYSM6310	Systems and Control Theory	3
SYSM6311	Software Maintenance, Evolution and Re-engineering	3
SYSM6312	Advanced Requirements Engineering	3
SYSM6313	Software Testing, Validation, Verification	3
SYSM6314	Modeling and Simulation of Engineering Systems	3
IIB		
SYSM6315	Entrepreneurship	3
SYSM6316	Innovation within the Corporation	3
SYSM6317	The Management of High Tech Products (*)	3
SYSM6318	Marketing Management, Marketing Systems Analysis	3
SYSM6319	Business Economics	3
SYSM6320	Strategic Management	3

a) ***Required Courses*****:** Students will be required to take at least 2 courses from Group IA and at least 2 courses from Group IB (a total of 6 credit hours) out of an offered set of 4 courses from Groups IA and IB**.** Thus the 4 required courses contribute a total of 12 credit hours towards an MS degree.

b) ***Prescribed Elective Courses*** will consist of an additional 4 distinct courses (a total of 12 credit hours) from the core curriculum of 20 courses, which have not already been taken towards the required 4 courses. At least two of these prescribed elective courses must be in Group IA or IIA.

c) ***Free Elective Courses*:** For the free electives, students will be able to take any 4 additional and distinct courses of the remaining 12 core courses that have not already been taken as required courses or prescribed elective courses. They may also take additional free elective courses that are already being offered in engineering or in management that will allow "concentration" or "specialization" in specific industry sectors.

Total Semester Credit Hours:
12 (Required) +12 (Prescribed Electives) +12 (Free Electives) = 36

d) ***Thesis Option:*** Alternatively, students who choose the thesis option will be able to substitute 6 hours of free electives with a written thesis in addition to the 12 required credit hours and 12 prescribed elective credit hours.

C. **Academic Council** – Due to the unique nature of this program and the 50/50 joint collaboration between Engineering and Management Schools, academic leadership and oversight for this program will be provided by a committee consisting 4 faculty from each school and more specifically by the Co – Program Heads of this program, one from each school **(Table-4).**

Table - 4

	Faculty Name	School
1	Dr. Milind Dawande, *Program Co-Head*	SOM
2	Dr. Mathukumalli Vidyasagar, *Program Co-Head*	ECS
3	Dr. Alain Bensoussan	SOM
4	Dr. Duncan MacFarlane	ECS
5	Dr. Ozalp Ozer	SOM
6	Dr. Rajiv R. Shah	SOM
7	Dr. Lakshman Tamil	ECS
8	Dr. Bhavani Thuraisingham	ECS

D. Faculty – Use these tables to provide information about Core and Support faculty. Add an asterisk (*) before the name of the individual who will have direct administrative responsibilities for the program. *(Add and delete rows as needed.)*

Table - 5

Name of Core Faculty and Faculty Rank	Highest Degree and Awarding Institution	Courses Assigned in Program	% Time Assigned To Program
Dr. Farokh Bastani	Ph.D. In Computer Science	SYSM6313	25%

Professor	UC Berkeley		
Dr. Alain Bensoussan Distinguished Research Professor	Ph.D. in Mathematics University of Paris, France	SYSM6303	25%
Dr. Cy Cantrell Professor	Ph.D. in Physics Princeton University	SYSM6314	25%
Dr. Huseyin Cavusoglu Assistant Professor	Ph.D. in MIS UT Dallas	SYSM6330	25%
Dr. R. Chandrasekaran Ashbel Smith Professor	Ph.D. in Operations Research UC Berkeley	SYSM6309	25%
Dr. Kendra Cooper Associate Professor	Ph.D. In Electrical and Computer Engineering, U of British Columbia	SYSM6301	25%
Dr. Milind Dawande Professor	Ph.D. in Algorithms Carnegie Mellon University	SYSM6308	50%
Dr. Greg Dess Professor	Ph.D. in Organizational Behavior U of Washington	SYSM6314	25%
Dr. Nick Gans Assistant Professor	Ph.D. in Systems & Entrepreneurial Engineering, U of Illinois	SYSM6304	25%
Dr. R. Henderson Assistant Professor	Ph.D. in Electrical Engineering U of Michigan	SYSM6312	25%
Dr. Kamran Kiasaleh Professor	Ph.D. in Electrical Engineering USC	SYSM6310	25%
Dr. Robert Kieschnick Associate Professor	Ph.D. in Finance UT Austin	SYSM6306	25%
Dr. Nanda Kumar Associate Professor	Ph.D. in Marketing U of Chicago	SYSM6312	25%
Dr. Duncan MacFarlane Professor	Ph.D. In Electrical Engineering Brown University	SYSM6317	50%
Dr. Mathukumalli Vidyasagar, *Program Co-Head*	Ph.D. in Electrical Engineering University of Wisconsin	SYSM 6304	50%

Table - 6

Name of Support Faculty and Faculty Rank	**Highest Degree and Awarding Institution**	**Courses Assigned in Program**	**% Time Assigned To Program**
Dr. Peter Lewin Clinical Professor	Ph.D. in Economics University of Chicago	SYSM6313	25%

Dr. Shun-Chin Niu Professor	Ph.D. in Operations Research UC Berkeley	SYSM6302	25%
Dr. Ozalp Ozer Associate Professor	Ph.D. in Operations Research Columbia University	SYSM6305	25%
Dr. S. Ragunathan Professor	Ph.D. in Operations Research U of Pittsburgh	SYSM6308	25%
Mr. Bob Robb Senior Lecturer	MS in Biology University of Utah	SYSM6309	25%
Dr. Rajiv R. Shah Clinical Professor	Ph.D. in Electrical Engineering Rice University	SYSM6310	50%
Dr. I-ling Yen Associate Professor	Ph.D. in Computer Science U of Houston	SYSM6312	25%
Dr. R. Zalila-Wenkstern Associate Professor	Ph.D. in Computer Science U of Ottawa	SYSM6313	25%
Dr. Kang Zhang Professor	Ph.D. in Computer Science University of Brighton, UK	SYSM6311	25%
Dr. Laurie Ziegler Senior Lecturer	Ph.D. in Business Administration UT Arlington	SYSM6307	25%

Note – In both tables, Table-5 and Table-6, some faculty are shown assigned at 25 % and some are shown assigned at 50 %. This is due to the differences in their anticipated involvement in not only academic but also with program management and support responsibilities.

D. Students – Describe general recruitment efforts and admission requirements. Describe plans to recruit and admit students from under-represented groups for the program.

This program will participate in the general recruitment efforts of the School of Management (SOM) and the School of Engineering and Computer Science (ECS), and will have the same admission requirements as the Master's programs of these two schools.

In addition, the two schools jointly will promote this SEM program to local industry and corporations and will recruit heavily from these corporations –high performers in these companies with five to ten years of work experience in addition to their bachelor's and other masters degrees.

The two schools will also make every effort to recruit and retain underrepresented students into this program. Such efforts will include, but will not be limited to, advertising the program widely to communities and organizations with underrepresented populations; open houses, providing needed advising to such students on their academic work; and helping them on their career path. In addition, the two schools will also work with corporate partners to recruit members of under-represented communities from these companies.

E. Library – Provide the library director's assessment of library resources necessary for the program. Describe plans to build the library holdings to support the program.

The journal collection at the University of Texas at Dallas compares favorably with the collections at UT Arlington, UT Austin, and MIT. UT Dallas should add 2 additional titles during the next 3 years at the cost of $900. .

During the analysis of the book collection at the University of Texas at Dallas, the results indicated that the Library needed to increase the number of the titles available as compared to UT Austin and MIT. The Library immediately purchased 40 new titles at a cost of $5,062.

	Number of titles
UT Dallas	152+40 new titles (192)
UT Arlington	110
UT Austin	326
MIT	334

Given the shortage of book materials, the Library will need to increase spending by approximately 30 titles per year at a cost of $4,000 annually. Most of the new book titles will be purchased in electronic format using established procedures. Purchasing electronic books enables multiple customers to use the titles at one time and supports distance learning initiatives.

In summary, the graduate degree in systems engineering and management will cost the Libraries approximately $4,900 annually, plus inflation.

F. Facilities and Equipment – Describe the availability and adequacy of facilities and equipment to support the program. Describe plans for facility and equipment improvements/additions.

Current facilities are adequate to support the program. The School of Management and the School of Engineering and Computer Science buildings are both newly constructed, with cutting edge computing and other teaching facilities and technologies. Both buildings offer adequate facilities and equipment, in terms of office and classroom spaces, computing, research and teaching resources to accommodate the proposed program.

The School of Engineering and Computer Science also has extensive computer labs and facilities that can be used for this program and are considered adequate to support the program.

G. Accreditation – If the discipline has a national accrediting body, describe plans to obtain accreditation or provide a rationale for not pursuing accreditation.

Currently, the American Assembly of Collegiate Schools of Business (AACSB) is the accreditation body that accredits business school programs. Their standards for a business school can be found at http://www.aacsb.edu/accreditation/standards.asp. The School of Management was accredited by the AACSB in 2002 and will be accredited again in 2011. The management portion of the proposed MS in SEM degree program utilizes existing courses (as a part of our current MS and MBA degree programs) which meet the stated standards.

UT Dallas undergoes its standard SACS accreditation process and the new program will be integrated as part of the regular review and assessment procedures associated with this activity.

III. Costs and Funding

Five-Year Costs and Funding Sources - Use this table to show five-year costs and sources of funding for the program.

Table - 7

Five-Year Costs		**Five-Year Funding**	
Personnel[1]	$1, 800,000	Reallocated Funds	$ 1,800,000
Facilities and Equipment	$0	Anticipated New Formula Funding[3]	$ 650,000
Library, Supplies, and Materials	$25,000	Special Item Funding	$ 0
Other[2]	$0	Other[4]	$ 95,000
Total Costs	**$1, 825,000**	**Total Funding**	**$2,545,000**

Notes:
(1 The costs include the costs of faculty teaching these courses for the designated % time allocated to this program. So although no new faculty are being hired at this time, a portion of the existing faculties salaries have been accounted for in the costs as well as the reallocated funds for this particular program.
(3)Formula funding calculations: 62.19 x 18 credit hours x 5.525 (averaged SOM and ECS rate) x new students for years 3, 4, and 5.
(4) Designated tuition fee rate: 18 credit hours x $50 (averaged SOM and ECS fee) x new students for years 3, 4, and 5

Signature Page

1. Adequacy of Funding – The chief executive officer shall sign the following statement:

   I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.

   _____

   Chief Executive Officer Date

2. Board of Regents or Designee Approval – A member of the Board of Regents or designee shall sign the following statement:

   On behalf of the Board of Regents, I approve the program.

   _____

   Board of Regents (Designee) Date of Approval

3. Board of Regents Certification of Criteria for Commissioner of Assistant Commissioner Approval –

   For a program to be approved by the Commissioner or the Assistant Commissioner for Academic Affairs and Research, the Board of Regents or designee must certify that the new program meets the eight criteria under TAC Section 5.50 (b): The criteria stipulate that the program shall:

   (1) be within the institution's current Table of Programs;
   (2) have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
   (3) have sufficient clinical or in-service sites, if applicable, to support the program;
   (4) be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
   (5) attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
   (6) not unnecessarily duplicate existing programs at other institutions;
   (7) not be dependent on future Special Item funding
   (8) have new five-year costs that would not exceed $2 million.

   On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b).

   _____

   Board of Regents (Designee) Date

Appendix 1 Confirmation of Support

Local industry representatives that have been contacted and who have confirmed their interest, and a potential commitment to send 15 to 20 students through this program at any given point in time are –

1.	Mr. Steve Lyle	s-lyle@ti.com
2.	Mr. Martin Izard	izzard@ti.com
3.	Mr. Alan Gatherer	gatherer@ti.com
4.	Mr. Tom Hill	tom.hill@eds.com
5.	Mr. John McDonald	John_T_McDonald@raytheon.com
6.	Ms Lynn Mortnesen	lmortensen@raytheon.com
7.	Mr. Paul Klocek	p-klocek@raytheon.com
8.	Mr. Alan Caslavka	accaslav@rockwellcollins.com

We have also included four formal letters of support.

Item #12XX

Thomas L. Hill
Fellow

To: Coordinating Board

From: Thomas L. Hill, Director HP Enterprise Services Fellows and Distinguished Engineering

Date: September 29, 2009

Subject: Strong Support for The University of Texas at Dallas Systems Engineering and Management Program

HP Enterprise Services is excited to participate in the Systems Engineering and Management Program proposed by The University of Texas at Dallas.
We have worked closely with the curriculum development team to ensure that the course content is relevant to our industry.

The current North Texas business environment requires that engineers also be adept managers and leaders with the ability to supervise large, complex engineering projects. Unlike other degree programs in Texas, this program is the first to address this particular need as it integrates disciplines, focusing on both systems engineering and systems management.

The Systems Engineering and Management degree program is ideal for candidates with five or more years of experience, and as a result, graduates will be uniquely positioned to join large engineering management or government organizations at mid- to upper- management levels. Additionally, graduates of this program, trained to manage large systems with many interdependent parts, will provide a competitive advantage of particular interest to HP Enterprise Services.

Most importantly, the flexibility of the program provides industry partners the opportunity to tailor the degree to address current business needs, while the adaptable, interdisciplinary curriculum also allows students to gain the specific skills they require to successfully oversee complex projects. Thank you for your consideration of this proposed degree program— it will certainly be of interest to organizations in North Texas. I will make sure our organization and other organizations are ready to enroll when the program begins.

Sincerely,

Thomas L. Hill
HP Enterprise Services
H4-GF-20
5400 Legacy Drive
Plano, Texas 75924

Item #12XX

Technology for better business outcomes.

Item #12XX

September 25, 2009

Dr. Rajiv Shah
School of Management
The University of Texas at Dallas
800 West Campbell Road SM 43
Richardson, Texas 75080-3021

Dear Dr. Shah,

This letter is offered in strong support for The School of Management and The Erik Jonsson School of Engineering and Computer Science's proposed degree program, Systems Engineering and Management. Currently there is an industry need for trained leadership with experience in both engineering and management. This degree program, using an interdisciplinary approach, focuses on the engineering and management of complex engineering projects, such as the automatic control of machinery; logistics and the coordination of different teams; and implementing work processes and tools to handle such projects.

The degree program addresses both the technical and human centered disciplines by covering issues such as control engineering and project management. This unique program is both innovative and flexible, allowing students to concentrate on a host of disciplines ranging from healthcare and defense, both of particular interest to ELCAN, to macro-economic and financial services. The adaptability of the program allows companies the opportunity to target specific needs within their corporation by training future leaders in that area.

In my view, the ideal candidates for this degree program would have five to ten years of industry experience and the desire to transcend their discipline while enhancing their engineering skill-set. As the program becomes established, I anticipate that ELCAN would encourage and support enrollment in this degree program as part of our ongoing talent development activities. Beyond ELCAN, I believe this program aligns well with the interests of the large number of high-tech organizations in the North Texas region.

Sincerely,

Paul Klocek
General Manager
ELCAN Optical Technologies
a Raytheon Company

Item #12XX

Texas Instruments Incorporated

September 30, 2009

Dr. Rajiv Shah
School of Management
The University of Texas at Dallas
800 West Campbell Road SM 43
Richardson, Texas 75080-3021

Dear Dr. Shah,

As an industry partner, you know that I have had the opportunity to work closely with both The School of Management and The Erik Jonsson School of Engineering and Computer Science to establish the proposed interdisciplinary degree program, Systems Engineering and Management. Today I write in strong support of this program which satisfies a growing industry need for trained business leaders with formalized education in both engineering and management.

By focusing on a candidate's specific needs, this unique program's flexible curriculum provides experienced candidates the necessary tools to manage complex "macro" systems. Graduates of the program will be equipped to oversee these challenging projects that require knowledge of scientific, engineering, and management disciplines.

As the program becomes established, I anticipate that Texas Instruments would encourage and support enrollment in this degree program as part of our ongoing talent development activities.

Please keep us advised of your progress in the development and implementation of this exciting new program.

Sincerely,

Steve Lyle
Manager
Education, Workforce Development & Diversity

Item #12XX

September 29, 2009

Dr. Rajiv Shah
School of Management
The University of Texas at Dallas
800 West Campbell Road SM 43
Richardson, Texas 75080-3021

Dear Dr. Shah,

I am writing to express my support for the Systems Engineering and Management joint degree program collaboratively created by The School of Management and The Erik Jonsson School of Engineering and Computer Science. Successful management of large, complex engineering projects is critical for Raytheon, and in our industry, there is a need to formally educate leaders who can oversee these multifaceted projects.

This unique program leverages the strengths of both the Schools of Management and Engineering to train students based on their areas of need regarding systems engineering and systems management. In this way, experienced engineers and managers can focus on learning applicable skills that will enable them to architect, research, develop, engineer, manage, execute, and deliver complex systems programs while managing large teams and budgets.

Raytheon Intelligence & Information Systems, as well as other businesses in the North Texas region, will certainly take advantage of this program in terms of talent development and hiring of graduates. The Systems Engineering and Management degree program provides future business leaders the opportunity to pursue an interdisciplinary course of study critical for the continued success and growth of high-tech organizations.

Sincerely,

John T. McDonald
Chief Engineer/Chief Architect
RTN IIS Engineering
972.205.7360 (office)
214.244.2691 (BB)
RTN Six Sigma Expert
Raytheon Certified Architect

Proposed Academic Certificates Program

Title: *Certificates in Systems Engineering & Management (SEM)*
School: *School of Management (SOM) and*
The Jonsson School of Engineering & Computer Science (ECS)

Contacts: *SOM – Dr. Rajiv R. Shah; ECS – Dr. Duncan MacFarlane*
Rajiv.shah@utdallas.edu; Duncan.macfarlane@utdallas.edu

Implementation Date: *Spring 2010*

Introduction/Description: Traditional state-of-the-art areas of study in engineering and associated management in the last few decades have involved the study of small or "tiny" systems – micro-, nano-, info-, and bio- systems. However, there has been a large, growing "unmet" need for formalized education in engineering, management, as well as in other areas of more and more complex, larger and larger "macro" systems that involve a large number of interconnected components and have a very significant societal impact. These areas are at the intersection or overlap of traditionally "silo'd" disciplines of study not only in engineering and management, but also include – natural sciences, social sciences, as well as arts and humanities.

Academic Focus of the 2 Certificates: *What follows is an overarching description that addresses 2 separate and distinct certificates, 12 credit hours each, with each certificate to be taken in at most 1 academic year. The names of the 2 Certificates will be –*

(1) Certificate in Systems Engineering
(2) Certificate in Systems Management

Academically, the certificates will focus on educating industry sponsored corporate employees in the disciplines of – Systems Engineering and Systems Management. It will employ rigorous quantitative, as well as qualitative methods, leveraging the best faculty in two of the largest and most-quantitatively oriented schools on campus – SOM and ECS, as well as appropriate guest faculty in the local region who are leaders in their respective fields. The Program will also offer concentrations from a "systems" perspective in several areas, driven by market demand from local companies, and will invite appropriate faculty from other schools on campus, as well as experts in the field to teach these "non-core" specialty courses as part of the certificates program.

***Job Market Need* for the 2 Certificates:**

The target customers for this program will be local and regional industry in various sectors that architect, develop, engineer, manufacture, manage, plan or research all aspects – engineering, as well as financial, human resources or project or program management - of large and complex systems.

The target vertical sectors could, therefore, be fairly wide-ranging – aerospace, defense and space systems; transportation systems; information and communications technology (ICT) systems; information assurance and cyber-security systems; healthcare systems; energy, environment and infrastructure systems; complex biological systems; macro-economic and financial systems; etc. The choice of specific certificates in the "non-core" areas of specialization will be driven by market demand from specific industry sectors and companies willing to sponsor employees through this program.

Systems Engineering & Management comprises of a wide range of areas – traditional industrial engineering, traditional engineering management, as well as **segments** of traditional - electrical engineering, computer science and engineering, hardware and software engineering, mechanical engineering, biomedical engineering, aerospace engineering, transportation engineering, operations research and others. As such, the field of Systems Engineering & Management potentially represents a large portion of the engineering population.

Data compiled by the Greater Dallas Chamber of Commerce (GDC), and the Texas Workforce Commission (TxWFC) in 2007 across various High-tech Sectors that might be relevant to SE&M, but not including the Defense, Energy and Healthcare Sectors, indicates an engineering population in the DFW Metroplex well in excess of 200, 000. Even if 5 % of these very conservatively are assumed to be Systems Engineers and Managers, that translates to about 10, 000. Again, if we were to conservatively assume that these 10,000 engineers and managers renew their skills every 10 years that still creates a potential Total Available Market (TAM) of 1000 engineers and managers every year who would need SE&M training every year in the DFW alone.

Student Demand

Interests in this new discipline have been verified in discussions with local companies – TI, EDS-HP, Raytheon, Rockwell and others – along with an initial interest in potential commitment of employees to send through this program.

Programs in this field have developed at all tier-1 schools such as MIT, Stanford, Caltech, CMU, Georgia Tech, Cambridge University, and is also strongly supported by the NAE and the NSF.

Enrollment Projections

Based upon strong interests expressed by a number of area companies such as Texas Instruments, Rockwell, Raytheon, EDS-HP and other members of the SOM and ECS Advisory Boards we expect to have a commitment from these companies to send a certain number of students through the program at any given point in time. These discussions suggest that the following progression for enrollment might be very realistic.

Year	1	2	3	4	5
Headcount	20	25	30	35	40
FTSE	20	25	30	35	40

Admission Policy: The program will be targeted to corporate employees **with a minimum of BS degree in engineering or mathematics or physics** (in order to ensure adequate fundamental skills in mathematics) **and at least 5 years of industry experience**, who are potentially high performers in their respective companies, and **will be sponsored by their corporate management** to enhance their skills in both the engineering and management aspects of leading large and complex projects.

Organizational Arrangement: The program will be jointly offered and co-managed by two schools – SOM and ECS. Faculty for the core courses will be from these two

schools. Faculty from other schools on campus will be invited to teach "non-core" courses, as appropriate. Industry leaders with expertise in specific fields will be invited as appropriate, as well.

Credit Hours and Degree Programs: *Each of the 2 separate certificates will require 12 credit hours each, with each certificate to be taken in at most 1 academic year.* The courses will be offered in 4 hour modules, 2 modules per day, over either 3 days or 4 days per month format, thus requiring either 8 months or 6 months per certificate. These certificates constituting a total of 24 credit hours, along with 12 additional elective credit hours of courses, for a total of 36 credit hours will lead to an MS degree – details have been spelled out in the proposal for the Masters Program which has been applied for concurrently.

Course Offerings and Site Locations (note new courses with an asterisk):

Table - 1

Prefix & Number	Core Curriculum	Credit
IA		
SYSM6301	Systems Engineering Architecture & Design (*)	3
SYSM6302	Quantitative Risk, Probability, Stochastic Processes	3
SYSM6303	Systems Engineering Risk & Decision Analysis	3
SYSM6304	Dynamic Systems Modeling & Analysis (*)	3
IB		
SYSM6305	Systems Project Management	3
SYSM6306	Engineering Economics	3
SYSM6307	Human Factors in Complex Organizations	3
SYSM6308	Manufacturing and Service Systems Planning and Analysis	3
IIA		
SYSM6309	Dynamics of Complex Structures	3
SYSM6310	Systems and Control Theory	3
SYSM6311	Software Maintenance, Evolution and Re-engineering	3
SYSM6312	Advanced Requirements Engineering	3
SYSM6313	Software Testing, Validation, Verification	3
SYSM6314	Modeling and Simulation of Engineering Systems	3
IIB		
SYSM6315	Entrepreneurship	3
SYSM6316	Innovation within the Corporation	3
SYSM6317	The Management of High Tech Products (*)	3
SYSM6318	Marketing Management, Marketing Systems Analysis	3
SYSM6319	Business Economics	3
SYSM6320	Strategic Management	3

Location: All courses will be taught at UT Dallas

Table - 2

Faculty/Staffing (assign each course to a faculty member):

Name of Core Faculty and Faculty Rank	Highest Degree and Awarding Institution	Courses Assigned in Program	% Time Assigned To Program
Dr. Farokh Bastani Professor	Ph.D. In Computer Science UC Berkeley	SYSM6313	25%
Dr. Alain Bensoussan Distinguished Research Professor	Ph.D. in Mathematics University of Paris, France	SYSM6303	25%
Dr. Cy Cantrell Professor	Ph.D. in Physics Princeton University	SYSM6314	25%
Dr. Huseyin Cavusoglu Assistant Professor	Ph.D. in MIS UT Dallas	SYSM6330	25%
Dr. R. Chandrasekaran Ashbel Smith Professor	Ph.D. in Operations Research UC Berkeley	SYSM6309	25%
Dr. Kendra Cooper Associate Professor	Ph.D. In Electrical and Computer Engineering, U of British Columbia	SYSM6301	25%
Dr. Milind Dawande Professor	Ph.D. in Algorithms Carnegie Mellon University	SYSM6308	50%
Dr. Greg Dess Professor	Ph.D. in Organizational Behavior U of Washington	SYSM6320	25%
Dr. Nick Gans Assistant Professor	Ph.D. in Systems & Entrepreneurial Engineering, U of Illinois	SYSM6304	25%
Dr. R. Henderson Assistant Professor	Ph.D. in Electrical Engineering U of Michigan	SYSM6312	25%
Dr. Kamran Kiasaleh Professor	Ph.D. in Electrical Engineering USC	SYSM6310	25%
Dr. Robert Kieschnick Associate Professor	Ph.D. in Finance UT Austin	SYSM6306	25%
Dr. Nanda Kumar Associate Professor	Ph.D. in Marketing U of Chicago	SYSM6318	25%
Dr. Duncan MacFarlane Professor	Ph.D. In Electrical Engineering Brown University	SYSM6317	50%
Dr. Mathukumalli Vidyasagar, *Program Co-Head*	Ph.D. in Electrical Engineering University of Wisconsin	SYSM 6304	50%

1. **The Certificate in Systems Engineering *will require at least two courses from Groups IA or IIA*, and two additional courses not already taken from Table-1.**
2. **The Certificate in Systems Management *will require at least two courses from Groups IB or IIB*, and two additional courses not already taken from Table-1.**
3. **Those pursuing more than one certificate, *will be required to take courses that are distinct and different from those taken by them for a previous certificate – in other words, courses cannot be repeated.***

Additional Information:

(1) Course requirements have been developed through discussions with industry partners and colleagues through most of 2008 and the first half of 2009 – most notably Texas Instruments. TI has participated in all discussions about this program through these 18 months.

(2) Program overviews have also been shared with representatives of EDS/HP and Raytheon, with strong support expressed for the objectives of the program.

(3) Presentations have also been made about this program at the Industry Advisory Board Meetings of the Jonsson School and with some members of the SOM Advisory Board as well. These have been very well received with strong encouragement for moving forward with the program.

PROGRAM ASSESSMENT PLAN

Program/Unit Identification

Program or Unit Name: Certificate in **Systems Engineering** *Schools:* **ECS &SOM**

Program or Unit Director: Dr. Rajiv R. Shah & Dr. Duncan MacFarlane

Program or Unit Purpose or Mission Statement or Program Educational Objective

Your mission statement or purpose should be in alignment with the university's mission and the school's mission, explicitly cover the educational mission.

Provide formalized education in a large, growing "unmet" need primarily in the area of **Systems Engineering,** but also additional training in the areas of systems engineering and systems management of increasingly complex, increasingly large "macro" systems that involve a large number of interconnected components and potentially have a very significant societal impact. These areas are at the intersection or overlap of traditionally "silo'd" disciplines of study not only in engineering and in management, but also include – natural sciences, social sciences, as well as arts and humanities. It will employ rigorous quantitative, as well as qualitative methods, leveraging the best faculty in two of the largest and most-quantitatively oriented schools on campus – SOM and ECS, as well as appropriate faculty from other schools and in the local region who are leaders in their respective fields.

Student learning outcomes assessment is defined as the ongoing monitoring of the extent to which students are developing the knowledge, skills, beliefs, and attitudes that are appropriate for graduates of the respective academic programs.

Student Learning Objective #1

Learn advanced techniques in systems engineering including - systems architecture and design; probability and stochastic processes; quantitative risk and uncertainty assessment and engineering decision analysis; dynamic systems and modeling analysis.

#	Performance Criteria	Measures and Procedures	Criteria: What Constitutes Success (Target)	Timeframe
1	Assessment procedures and methods may include those shown in the next column	i. Quizzes, Tests and Exams ii. Case Discussion and Case Studies iii. Class Discussion and Participation iv. Projects, Project Reports and Presentations (SYSM6301 through SYSM6304 or SYSS6309 through SYSM6314)	Student success will be determined by their performance in each of the assessment methods chosen	At the end of Spring 2010, the 1st semester of course launch

Student Learning Objective #2

Learn advanced techniques in systems management including – Project and Program Management; Financial and Accounting Management; Operations Management; and People Management, Organizational Behavior and Leadership

#	Performance Criteria	Measures and Procedures	Criteria: What Constitutes Success (Target)	Timeframe
1	Assessment procedures and methods may include those shown in the next column	i. Quizzes, Tests and Exams ii. Case Discussion and Case Studies iii. Class Discussion and Participation iv. Projects, Project Reports and Presentations (SYSM6305 through SYSM6308 or SYSS6315 through SYSM6320)	Student success will be determined by their performance in each of the assessment methods chosen	At the end of Spring 2010, the 1st semester of course launch

PROGRAM ASSESSMENT PLAN

Program/Unit Identification

Program or Unit Name: Certificate in **Systems Management** *Schools:* **SOM & ECS**

Program or Unit Director: Dr. Rajiv R. Shah & Dr. Duncan MacFarlane

Program or Unit Purpose or Mission Statement or Program Educational Objective

Your mission statement or purpose should be in alignment with the university's mission and the school's mission, explicitly cover the educational mission.

Provide formalized education in a large, growing "unmet" need primarily in the area of **Systems Management,** but also additional training in the areas of systems engineering and systems management of increasingly complex, increasingly large "macro" systems that involve a large number of interconnected components and potentially have a very significant societal impact. These areas are at the intersection or overlap of traditionally "silo'd" disciplines of study not only in engineering and in management, but also include – natural sciences, social sciences, as well as arts and humanities. It will employ rigorous quantitative, as well as qualitative methods, leveraging the best faculty in two of the largest and most-quantitatively oriented schools on campus – SOM and ECS, as well as appropriate faculty from other schools and in the local region who are leaders in their respective fields.

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Student Learning Objective #2

Learn advanced techniques in systems engineering including - systems architecture and design; probability and stochastic processes; quantitative risk and uncertainty assessment and engineering decision analysis; dynamic systems and modeling analysis.

#	Performance Criteria	Measures and Procedures	Criteria: What Constitutes Success (Target)	Timeframe
1	Assessment procedures and methods may include those shown in the next column	i. Quizzes, Tests and Exams ii. Case Discussion and Case Studies iii. Class Discussion and Participation iv. Projects, Project Reports and Presentations (SYSM6301 through SYSM6304 or SYSS6309 through SYSM6314)	Student success will be determined by their performance in each of the assessment methods chosen	At the end of Spring 2010, the 1st semester of course launch

Item #12ZZ

GRADUATE CATALOG CHANGES
CATALOG YEARS: 2010-2012

DATE: October 15, 2009
TO: GRADUATE DEAN
FROM: Dean Hasan Pirkul

SCHOOL Management

DEPARTMENT Management

BASIS FOR CATALOG CHANGES:

1. **New Executive Education Catalog Section** – we decided this year to separate out all executive programs and their electives into a new section to avoid confusion with our conventional programs. We hope to reduce inquiries from students in our regular programs about the availability of executive electives. The format of this new section also allowed us to more clearly describe the different level requirements within the Project Management, Health Management and Coaching areas, from certificate level coursework through the requirements for obtaining the MS or MBA. Thus we also eliminated some of these separate sections that were too small to stand alone effectively.
2. **MS-MAS Degree Changes** – we changed this degree description to allow students to choose curricula beyond the required courses in all of the concentrations offered by the areas in the School. The more flexible format allows students to choose combinations of concentrations, thus making it attractive to students who are looking for breadth unlike the more focused MS courses that we offer.
3. **Course Changes** – new courses below are a result of evolving programs such as the executive MBA, healthcare management, entrepreneurship, finance, supply chain, and now marketing areas. The series of special topics courses provides an area-specific alternative to proliferating, and confusing, MAS courses that now must all appear in course lookup under Orion. Other course changes are the usual updating of cross-listings, frequency, course descriptions and textual error corrections.

NEW and DELETED PROGRAMS/DEGREES/CERTIFICATES

None

NEW COURSES ADDED

AIM 6371 - Securities Law
AIM 6381 – Accounting Theory
AIM 6387 – Executive Compensation and Shareholder Returns

BPS 6321 – Contemporary Business Issues and Strategy
BPS 7303 - Doctoral Teaching and Writing Seminar

ENTP 6350 – SIFE Entrepreneurial Practice
ENTP 6382 – Professional Salesmanship
ENTP 6387 – Forecasting Industry and Technology Futures
ENTP 6392 – Entrepreneurship in the Social Sector

FIN 6352 – Financial Modeling
FIN 6356 – Mergers and Acquisitions,
FIN 6357 – Corporate Restructuring and Turnarounds

HMGT 6332 – Quality Improvement in Healthcare: Six Sigma and Beyond
HMGT 6333 – Ethics in Healthcare Management

HMGT 6v15 – Self-Directed Field Study

AIM 6v99 - Special Topic in Accounting & Information Management
BPS 6v99 - Special Topic in Business Policy & Strategy
ENTP 6v99 - Special Topic in Entrepreneurship
FIN 6v99 - Special Topic in Finance
HMGT 6v99 - Special Topic in Healthcare Management
MECO 6v99 - Special Topic in Managerial Economics
MIS 6v99 - Special Topic in Management Information Systems
MKT 6v99 - Special Topic in Marketing Management
OB 6v99 - Special Topic in Organizational Behavior
OPRE 6v99 - Special Topic in Operations Research

BPS 6250 - Business Transformation Project I (EMBA)
BPS 6351 - Business Transformation Project II (EMBA)
FIN 6251 – Strategic Financial Management and Valuation I (EMBA)
FIN 6351 – Strategic Financial Management and Valuation II (EMBA)
FIN 6150 – The Financial Crisis (EMBA)

MIS 6344 – Web Analytics
MIS 6362 – Web Services and Service Oriented Architecture
MIS 6372 – Managing Outsourced IT-Enabled Services

MKT 6337 – Marketing Analytics using SAS
MKT 6338 – Customer Relationship Management
MKT 6339 – Capstone Marketing Decision Making

OPRE 6378 – Information Enabled Supply Chains

OB 6336 – Individual Difference, Self-Motivation, and Employee Development
OB 6337 – Motivational Leadership in Organizations
OB 6338 – Coaching as a Leadership Style

COURSES DELETED

BPS 6350 – Enterprise Transformation Management
ENTP 6360 - Entrepreneurial Ventures

OTHER COURSE COMPONENT CHANGES

AIM 5300 – Accounting and Information Management Internship (Number Change to 6300)
AIM 6334 – Auditing (Copy change)
AIM 6335 – Ethics for Professional Accountants (Y to S)
AIM 6338 – Accounting Systems Integration and Configuration (Y to R)
AIM 6342 – Strategic Cost Management (Y to R)
AIM 6343 – Accounting Information Systems (R to S)
AIM 6346 – Financial Dimensions of Mergers and Acquisitions (Y to R)
AIM 6347 – Current Topics in Advanced Cost Management (Y to R)
AIM 6349 – Information Technology Strategy and Management (Y to R)
AIM 6356 – Tax Research (S to Y)
AIM 6377 Corporate Governance and Accounting (Drop prerequisites)
AIM 6383 – change name to Fraud Examination
AIM 6385 – Managerial Accounting in Enterprise Systems (Y to R)
AIM 6386 - Risk Management, Compliance and Regulation (Name Change, remove prerequisite)

BPS 6301 – The Environment of Business (Changed from 2 credit hours to 3)

BPS 6260 – Readings in Management (Drop 6210 as prerequisite)
BPS 6385 (ENTP 6385) - Entrepreneurial Business Strategies (Copy change)

ENTP 6375 – Technology and New Product Development (Name and Copy Change to remove 6360 as prereq.)
ENTP 6388 – Managing Innovation within the Corporation (Name and Copy Change to remove 6360 as prereq.)
ENTP 6390 – Business Plan Development (Name and copy change to Business Model Development etc.)
ENTP 6398 – The Entrepreneurial Experience (Copy Change)

FIN 6314 – Fixed Income Securities (Change prerequisite to 6310)
FIN 6320 - Financial Markets and Institutions (drop MECO 6201 and OPRE 6301 as prerequisites)
FIN 6330 - Behavioral Finance (Add as prerequisite FIN 6301 or consent of instructor)
FIN 6340 - Management of Financial Institutions (Drop as prerequisite FIN 6310 and add consent of instructor)
FIN 6350 - Advanced Financial Management (Change to just FIN 6301 as prerequisite)
FIN 6360 - Options and Futures Markets (Drop both MECO prerequisites)
FIN 6370 - The Theory of Finance and Its Applications (Drop FIN 6301 as one of the prerequisites)
FIN 6380 - Practicum in Investment Management (Change name from Practicum in Finance to Practicum in Investment Management)
FIN 7330 - Topics in Theoretical Asset Pricing (Drop FIN 6312 and 6364 from list of prerequisites)
FIN 7340 - Topics in Theoretical Corporate Finance (Drop FIN 6380 from list of prerequisites)

HMGT 6325 - Healthcare Operations Management (Change name to operations from supply chain)
HMGT 6329 - Special Topics in Healthcare Management (Change name to Seminar)

IMS 5200 – Global Business (Number Change to 6204)
IMS 6302 – Legal Aspects of International Business Transactions (Changes to name and from 2 credit hours to 3)

MIS 6308 (AIM 6340) - Systems Analysis and Project Management (Description change)
MIS 6309 - Business Data Warehousing (Name Change)
MIS 6317 (HMGT 6323) - Healthcare Informatics (Copy and prerequisite change)
MIS 6319 – Enterprise Resource Planning (Catalog Copy Change)
MIS 6324 - Business Intelligence Software and Techniques (Copy change)
MIS 6330 - Information Technology Security (Copy change, drop prerequisite)
MIS 6334 - Advanced Business Intelligence (Copy change, add prerequisite)
MIS 6352 - Web Systems Design and Development(Copy change, drop prerequisite)
MIS 6360 - Software Project Management (Copy change, drop prerequisite)
MIS 7320 - Colloquium in Management Information Systems (Change from 3 hour to 2 hour course)

OPRE 6367 – Capstone Projects in Supply Chain Management (Prerequisite Changes: drop 6366)
OPRE 6369 – Supply Chain Software (Prerequisite Changes: add OPRE 6301 or 6302, drop 6366)

OB 6354 – Organizations and Environments (Changed from 2 credit hours to 3)

Item #12AAA

School of Management

- Preface/Degrees Offered
- Graduate Programs
- Master of Business Administration
- Master of Arts in International Management Studies
- Master of Science in Accounting and Information Management
- Master of Science in Finance
- Master of Science in Healthcare Management
- Master of Science in Information Technology & Management
- Master of Science in Management and Administrative Sciences
- Master of Science in Supply Chain Management
- Combination of Management and Engineering Graduate Degrees
- Doctor of Philosophy
- Certificate in Business Intelligence and Data Mining new!
- Course Descriptions
- Executive Education Programs and Course Descriptions
    - Executive MBA (EMBA)
    - Global Leadership Executive MBA (GLEMBA)
    - Healthcare Management
        - Executive MBA for physicians and senior healthcare administrators
        - Master of Science in Healthcare Management for physicians and senior healthcare administrators
        - Certificate in Healthcare Management for physicians and senior healthcare administrators
    - Organizational Behavior and Coaching
        - Master of Science in Management and Administrative Sciences with an emphasis in Organizational Behavior and Coaching
        - Certificate in Organizational Behavior and Coaching
    - Project Management
        - Executive MBA with an emphasis in Project Management
        - Master of Science in Management and Administrative Sciences with an emphasis in Project Management
        - Certificate in Project Management