CEE Undergraduate Handbook

2014-15 Edition

This handbook is updated every academic year.
It is recommend that students and advisors always use the current edition.

This is a living document and is updated every year. While very effort is expended to assure accuracy it undoubtedly possesses exceptions to this objective. If you identify discrepancies please inform the DUS (Joseph Nadeau, nadeau@duke.edu).

To the Prospective Student

This Handbook's primary objective is to serve the students and advisors of the CE and EnvE programs. While this Handbook provides specifics about the programs if you feel you need more general information please feel free to contact me.

To the CE or EnvE Major

This Handbook is intended to afford you convenient access to the information that you will need while you shape and direct your academic and professional experiences while here at Duke.

Duke has a lot to offer, be sure to take of advantage of it as you prepare yourself for life beyond Duke.

To the Advisor

This Handbook is an accurate reflection of the programs offered by the faculty of the Department of Civil and Environmental Engineering. The primary audience for this handbook are declared CE and EnvE majors, however, it is also intended to acclimate new advisors to these programs and to serve as a convenient resource for established advisors.

Hold tantamount the needs, interests, and goals of your individual advisees as you mentor them while they navigate the curriculum and prepare for a life beyond Duke.

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Director of Undergraduate Studies

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NOTES:

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Acronyms

For the user's convenience, a list of the abbreviations, acronyms, and systems used in this handbook are presented below.

ABET	originally stood for Accreditation Board for Engineering and Technology
ACES	ACES is an online system that provides students with a comprehensive system to view student accounts, financial aid and personal data, and to register for classes.
AE	Architectural Engineering
ALP	Arts, Literature, and Performance [Trinity Area of Knowledge (AoK)]
AoK	Areas of Knowledge
AP	Advanced Placement
ARC	Academic Resource Center
ASCE	American Society of Civil Engineers
BSE	Bachelor of Science in Engineering
CAPS	Counseling and Psychological Services
CE	Civil Engineering (major)
CEE	Civil and Environmental Engineering (department, subject code)
CZ	Civilizations [Trinity Area of Knowledge (AoK)]
DEID	Duke Engineers for International Development
DCS	Duke Community Standard
DGS	Director of Graduate Studies
DUS	Director of Undergraduate Studies
E&AS	Engineering and Applied Science
E/W	Environmental Engineering and Water Resources (a track of CE major)
EI	Ethical Inquiry [Trinity Mode of Inquiry (MoI)]
ENRENV	Energy and Environment, a certificate
EnvE	Environmental Engineering (major)
FE	Fundamentals of Engineering
FL	Foreign Language [Trinity Area of Knowledge (AoK)]
GC	Grand Challenge
GEO	Global Education Office
GRE	Graduate Record Examinations
GwDD	Graduation with Departmental Distinction
IPC	International Placement Credit
LEED	Leadership in Energy and Environmental Design
MoI	Modes of Inquiry
MEM	Master of Engineering Management
MEng	Master of Engineering
MS	Master of Science
NAE	National Academy of Engineering
NCEES	National Council of Examiners for Engineering and Surveying
NCSU	North Carolina State University
NS	Natural Science
PE	Professional Engineer

PhD	Doctor of Philosophy
R&D	Research and Development
S/M	Structural Engineering and Mechanics (a track of CE major)
SISS	The Student Information Services and Systems (SISS) Office assists the university central administrative and school offices to provide more efficient services to students, faculty and staff.
SS	Social Science [Trinity Area of Knowledge (AoK)]
SS/H	Social Science and Humanities
STORM	STORM is the faculty/staff self-service application providing users with access that depends on their university role and security. In the Faculty Center, instructors can view and print class rosters and enter grades. Advisors/Deans can view advisee academic information and add comments to a student's record in the Advisor Center. The Department Center allows Departmental staff to view and update student contact information, view student account details, generate permission numbers, change enrollment limits, add instructors to classes, view current schedule of classes and much more. The Admissions Center displays information about applicants, like school history, test scores and personal information data.
TOEFL	Test of English as a Foreign Language
XE	Chi Epsilon [National Civil Engineering Honor Society]

Preface

Errors and Omissions

If you find an error (disastrous or inconsequential), or think that you *may* have located an error, please send an email to the DUS (Joseph Nadeau, nadeau@duke.edu) to report your finding. Error findings and any general feedback regarding this handbook would be greatly appreciated by, in particular, users of future editions of this handbook. Thank you, in advance for your assistance.

Matriculation versus Class-of-20xx

Policies and regulations to which you are held are those that are in effect when you matriculate, or first enroll at Duke. For this reason this Handbook is constructed around matriculation date, as opposed to the more common way referring to a cohort of students by their class. Assuming a four-year curriculum, the correspondence between matriculation date and class-of designation is as follows:

2014-15 Standing	Matriculation Date	Class of
First-Year	Fall 2014	2018
Sophomore	Fall 2013	2017
Junior	Fall 2012	2016
Senior	Fall 2011	2015
	Fall 2010	2014

Programmatic and Policy Changes

Changes to programs and policies do occur. As a result, different requirements may apply to different cohorts of students. Every effort has been made throughout this handbook to highlight the different requirements applying to different cohorts.

Changes within the previous four years include the following:

Fall 2014

- All CE and EnvE majors matriculating in Fall 2014, or after, must satisfy the ethical inquiry (EI) code requirement.

Fall 2013

- Effective Fall 2013, all social science and humanities courses must be taken from, or be cross-listed with, an approved department or program. This change is applicable to all Pratt students.
- The Environmental Engineering (EnvE) major was launched in Fall 2013.

ABET Accreditation

The CE major is ABET accredited.

The EnvE major was launched in Fall 2013. According to ABET requirements the EnvE major may not be reviewed for accreditation until after the first major graduates. The first majors are scheduled to graduate in May 2016, and the department will be seeking an ABET review of the EnvE program to occur in the fall of 2016. If the review is successful, and we fully believe that it will be, the EnvE students graduating in May 2016 will retroactively receive ABET accredited degrees.

Course Renumbering

Effective Fall 2012, Duke renumbered all courses. When convenient the old course number is presented in parentheses after the current course number, e.g., EGR 201L (75L).

CEE versus CE

The Department of Civil and Environmental Engineering (CEE) administers two undergraduate majors, namely, Civil Engineering (CE) and Environmental Engineering (EnvE). Thus, CEE is a department and CE is one of the two undergraduate majors.

Introduction and Overview

The infrastructure that makes up what we refer to as civilization is, for the most part, the work of civil and environmental engineers. Improving, or even maintaining, the quality of life is ever more challenging as urban problems in the industrialized nations of the world intensify, while rapid urbanization in many developing countries creates other opportunities and obligations for the civil and environmental engineer. The planning, design, construction, and maintenance of necessary facilities, in an era of increasingly scarce monetary and other resources, demand civil and environmental engineers dedicated to work for the public good and prepared to seek more efficient and effective solutions based on current technology. The challenges faced by civil and environmental engineers vary widely in nature, size, and scope, and encompass both the public and private sectors. Examples include homes, high-rise buildings, performance venues, airports, and seaports; networks of highways, long-span bridges, and tunnels; power generation structures including wind turbines and dams; distribution networks for drinking water and electrical power; collection networks for waste and flood control; Superfund sites and disposal facilities for hazardous wastes; and offshore and orbital structures.

This handbook provides an overview of the undergraduate programs in the Department of Civil and Environmental Engineering (CEE) at Duke University. It covers the program mission, educational objectives, requirements for both the Civil Engineering (CE) and Environmental Engineering (EnvE) majors, certificate information for the Architectural Engineering Certificate and the Energy & Environment Certificate, double major options (with BME), Energy Engineering minor, study abroad advice, information about the 4+1 graduate opportunity (?), and research/independent study opportunities.

The Bachelor of Science in Engineering (BSE) degree with a major in civil engineering (CE) offers two study tracks that allow students to pursue interests in either (or both) structural engineering and mechanics (S/M), or environmental engineering and water resources (E/W). The CE major will be of interest to students interested in, in part, the design and construction of civil infrastructure. CE is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

The Bachelor of Science in Engineering (BSE) degree is also offered with a major in environmental engineering (EnvE). The EnvE major will be of interest to students interested in obtaining an interdisciplinary undergraduate engineering degree that places emphasis on chemistry and bio-science fundamentals with applications to public health engineering. The Environmental Engineering program launched in Fall 2013 and responds to the needs of students looking for such an interdisciplinary engineering degree that prepares them to work as environmental engineers, graduate work in environmental engineering, or for advanced study in environmental law, medicine, public health, or global sanitation. The environmental engineering program will seek ABET accreditation for its first graduating class.

Your CEE Department

Mission Statement

The mission of Duke's Department of Civil and Environmental Engineering is to investigate, develop, and impart fundamental and advanced engineering knowledge relevant to the field of civil and environmental engineering and emerging global and national challenges. From a foundation of core technical knowledge and inquiry we provide an experiential exposure to innovative problem solving, research, leadership, and creativity that prepares our graduates for a successful career.

Educational Objectives for CE and EnvE Programs

The goals of both the CE and EnvE programs administered by the department are to position our graduates to:

- use their knowledge and understanding of engineering sciences and design to advance their professional career;
- think critically when solving and managing tasks;
- communicate effectively in multidisciplinary, professional environments;
- exercise professional responsibility and sensitivity in the context of the social, economic, ethical, and environmental implications of their engineering work;
- function effectively and efficiently as an individual and as a part of a team; and
- pursue life-long learning to earn relevant professional credentials (for example, licensure, professional or graduate degrees).

Student Outcomes for CE and EnvE Programs

CE and EnvE students will have the following capabilities upon completion of their degree:

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Who's Who in CEE and Pratt

This is not an exhaustive list of Duke, Pratt, and CEE administrators and staff, but rather those, whom due to their position or responsibilities, you are likely to interact with as a result of pursuing a CE or EnvE major.

Pratt Deans

The Dean of the Pratt School of Engineering is Dr. Tom Katsouleas. The Associate Dean for Undergraduate Education is Dr. Linda Franzoni.

Thomas Katsouleas

Linda Franzoni

The Dean for Undergraduate Affairs for CE, EnvE, and ME majors is Dean Lupita Temiquel-McMillian. Dean McMillian is your academic dean.

305 Teer Building
lupita.mcmillian@duke.edu
919-660-5996

Lupita Temiquel-McMillian

The Dean for Education and Outreach is Dean Martha Absher. Dean Absher is the contact person for the Pratt Fellows program and the NAE Grand Challenge Scholars program.

313 Teer Building
martha.absher@duke.edu
919-660-5139

Martha Absher

CEE Administration

The Chair of the Department of Civil and Environmental Engineering is Dr. John Albertson. The Associate Chair is Dr. David Schaad.

John Albertson

David Schaad

The Director of Undergraduate Studies (DUS) for the Department of Civil and Environmental Engineering is Dr. Joseph Nadeau.

173 Hudson Hall Annex
nadeau@duke.edu
919-660-5216

Joseph Nadeau

CEE Staff

The Administrative Assistant for CEE is Ruby Nell Carpenter.

121 Hudson Hall
ruby.carpenter@duke.edu
919-660-5200

Ruby Nell Carpenter

The CEE department has two research and development (R&D) engineers whose responsibilities include CEE teaching laboratories and laboratory safety.

Michael Blagg is the R&D engineer for the areas of structures, mechanics, and fluids.

053 Hudson Annex
michael.blagg@duke.edu
919-660-5198

Michael Blagg

Dwina Martin

Dwina Martin is the R&D engineer for the area of environmental engineering.

033 Hudson Hall
dwina@duke.edu
919-660-5481

Pratt Staff

Pratt's Undergraduate Program Coordinator is Lauren Stuglis. Ms. Stuglis works with student groups (e.g., ASCE, DEID) and coordinates a number of programs including peer advising (i.e., E-Team) and Pratt tours.

316 Teer Engineering Building
lauren.stulgis@duke.edu
919-660-5442

Lauren Stulgis

The Manager of the Pratt Student Shop is Steven Earp.

Pratt Student Shop[1]

Steven Earp

Liaisons to Pratt

The liaison within the Career Center to the Pratt School of Engineering is Katie Smith. Katie provides career advising for STEM undergraduates and hosts career skills workshops and industry programming in these fields.

Bay 5, 2nd Floor, Smith Warehouse
katie.smith@duke.edu
919- 660-1050

Katie Smith

The liaison within Duke University Libraries to the Pratt School of Engineering is Melanie Sturgeon.

Undergraduate Library Services[2]

Melanie Sturgeon

[1] http://www.studentshop.pratt.duke.edu/
[2] http://library.duke.edu/services/undergraduate

Personal, Academic, and Professional Integrity

[I]ntegrity is important in all areas of life. If we don't have integrity in the small things, if we find it possible to justify plagiarism or cheating or shoddy work in things that don't seem important, how will we resist doing the same in areas that really do matter, in areas where money might be at stake, or the possibility of advancement, or our esteem in the eyes of others?

Personal integrity is not a quality we're born to naturally. It's a quality of character we need to nurture, and this requires practice in both meanings of that word (as in practice the piano and practice a profession). We can only be a person of integrity if we practice it every day.[3]

Duke Community Standard[4] (DCS)

Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and nonacademic endeavors, and to protect and promote a culture of integrity.

To uphold the Duke Community Standard:

- *I will not lie, cheat, or steal in my academic endeavors;*
- *I will conduct myself honorably in all my endeavors; and*
- *I will act if the Standard is compromised.*

ASCE Code of Ethics[5]

Fundamental Principles

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

1. *using their knowledge and skill for the enhancement of human welfare and the environment;*
2. *being honest and impartial and serving with fidelity the public, their employers and clients;*
3. *striving to increase the competence and prestige of the engineering profession; and*
4. *supporting the professional and technical societies of their disciplines.*

Fundamental Canons

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[3] Excerpted from Bill Taylor's "A Letter to My Students."

[4] https://studentaffairs.duke.edu/conduct/about-us/duke-community-standard

[5] http://www.asce.org/Leadership-and-Management/Ethics/Code-of-Ethics/

1. *Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development3 in the performance of their professional duties.*
2. *Engineers shall perform services only in areas of their competence.*
3. *Engineers shall issue public statements only in an objective and truthful manner.*
4. *Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.*
5. *Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.*
6. *Engineers shall act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero-tolerance for bribery, fraud, and corruption.*
7. *Engineers shall continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision.*

Advising

Assemble a team of advisors. The department will assign you a faculty advisor but like all people your advisor will have strengths and weaknesses with regards to the types of information and advice they can provide.

Also see Who Can Help? on page 34.

Assignment of CEE Advisors

Incoming first-year students who indicate a first interest—or in many cases a second interest--in civil engineering, environmental engineering, or environmental science will be assigned a faculty member from the CEE department as their initial faculty advisor. A number of first year students with an indicated first interest of biomedical engineering are also assigned an initial faculty advisor from CEE. This initial assignment is for the first year and then until the student declares a major. To declare a major (as well as a second major, minors, and certificates—or to make changes to a previous declaration), complete the online declaration of major form.[6]

After declaring CE or EnvE as their major, the new major will be assigned a new advisor if the initial faculty advisor is outside of CEE or if the initial CEE faculty member was not a "match" (structural engineering and mechanics versus environmental engineering and water resources) given the student's declared interests on the declaration of major form.. The initial faculty advisor is a CEE faculty member and the field is a "match" then the advisor will not be changed, unless explicitly requested by the student.

The assignment of CEE faculty as advisors is based upon the expressed interests of the student, the interests of the faculty advisors, and the need to balance the number of advisees per faculty member.

For any reason, students may request a new faculty advisor by contacting the DUS.

First-Year Advising

In addition to individual meetings with faculty advisors, first-year students interested in CE and EnvE attend an orientation presentation by the CEE Director of Undergraduate Studies (DUS). The presentation covers the degree requirements and commonly asked questions.

To assist undecided students choosing a major in engineering, an elective course, EGR 90L (10), Introduction to Engineering, is offered to first year students in the fall term. This course surveys the fields of engineering offered by the Pratt School of Engineering, including presentations from each department given by senior students, faculty, industrial leaders, and/or recent alumni.

Pre-registration Advising

You will meet with your faculty advisor during the pre-registration period in March/April for fall semester courses and in October/November for spring semester courses. Your faculty advisor

[6] http://www.pratt.duke.edu/forms/declaration-of-major

will review your academic report, discuss with you the courses that you are considering, and, finally, your advisor will make you eligible to enroll in classes for the subsequent semester. Without this action by your advisor you will not be able to register for courses. Should you make any changes to your course plan after meeting with your advisor it is your responsibility to inform your advisor of those changes. Your advisor is likely to keep notes on your meetings and this will keep his or her notes accurate and, more importantly, your change in plan may trigger a comment from your advisor that could be beneficial to you.

During the advising meeting you should discuss any concerns or problems that you might be having academically, and you are encouraged to initiate conversations about the field of civil and/or environmental engineering that you may be interested in exploring further, and/or career options within the discipline.

Advisors use different means for scheduling advising appointments. The two most common means are a signup sheet outside their office or the Pratt online scheduling tool. Ideally, your faculty advisor will email you how to signup for a meeting. If not then you can email your advisor, swing by their office to see if they have a signup sheet, or check the online scheduling tool.[7]

Career Advising

Students can discuss their career plans with their faculty advisors. In addition, Duke's Career Center is available for career advising, support for career exploration, and assistance with job search skills such as networking, writing professional documents, and interviewing in preparation for securing summer internships, full-time employment, and other professional opportunities.

[7] http://advising.pratt.duke.edu/

AP Credits

All CE and EnvE majors may utilize the following AP credits in lieu of the corresponding BSE degree requirement

Duke Credit for AP Exam		BSE Degree Requirement
BIOLOGY 20 (19)	may be used in lieu of	BIOLOGY 201L (101L)
CHEM 20 (18)	may be used in lieu of	CHEM 101DL (31L)
CHEM 21 (19)	may be used in lieu of	CHEM 101DL (31L)
MATH 21 (31)	may be used in lieu of	MATH 111L (31L)
MATH 22 (32)	may be used in lieu of	MATH 112L (32L)
PHYSICS 25 (61)	may be used in lieu of	PHYSICS 151L (61L)
PHYSICS 26 (62)	may be used in lieu of	PHYSICS 152L (62L)

CE-E/W + BME: The "in lieu of"-equivalences noted above for BIOLOGY 20 and CHEM 20 do *not* apply to CE-E/W + BME dual majors.

Neither AP credits nor their Duke credit carry course codes. However, the Pratt School of Engineering does attribute, and Pratt students may utilize, the following area of knowledge codes to the following AP exams:

Economics (SS)
English (ALP)
History (CZ)
Political Science (SS)
Psychology (SS)
World Language and Culture (FL)

Restrictions and clarifications on AP credits:

- **SS/H**: Only two AP credits may be applied toward the five SS/H courses.
- **SS/H**: An AP exam cannot be used to satisfy the "200-level or higher"-component of the depth requirement for the SS/H courses.
- **Math**: If MATH 21 is the only math AP credit you have, then enroll in MATH 122L.
- **Physics**: If a student has AP credit for both PHYSICS 25 (61) & 26 (62), then one of PHYSICS 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for PHYSICS 26 (62) can be waived by taking PHYSICS 152L (62L). You do not have the option of taking PHYSICS 151 (61) and then using AP for PHYSICS 26 (62)--unless the only physics AP credit you have is for PHYSICS 26 (62).
- **Statistics**: AP credit for Statistics *cannot* be used in lieu of STA 130.

Additional information on AP credits and International Placement Credits (IPC) is available at Pratt's Policy and Procedures website.[8]

[8] http://www.pratt.duke.edu/undergrad/policies/3483

BSE Degree Requirements

As a program accredited by ABET, the CEE curricula must satisfy minimum requirements in mathematics, sciences, and engineering. In addition, the Pratt School of Engineering has requirements for all engineering students. To meet these constraints, the undergraduate degree program in civil engineering has specific requirements for undergraduate students. Samples of curricula for students with different CEE-related major choices are provided in Appendix C.

On Pratt's General BSE Degree Requirements

The general requirements mandated by Pratt for all BSE degrees can be found in the current Bulletin for Undergraduate Instruction and online.[9] It is not necessary for students to concern themselves with these requirements as they are all satisfied by all majors in Pratt. In other words, the CE Major Requirements and EnvE Major requirements specified below satisfy all general BSE degree requirements specified by Pratt. It is, however, worthwhile to mention two of these general requirements as they can be the genesis of particular requirements specified below within a major.

First, Pratt requires all majors to have four (4) natural science courses. As part of this, Pratt specifies one chemistry course and two physics courses, leaving one natural science elective to be specified by the major. Because this natural science elective is different for each engineering major, students should be very careful to satisfy the requirements applicable to his/her major.

Second, Pratt requires all majors to complete a course from four of the following seven areas: digital systems, electrical science, information and computer science, mechanics (solid and fluid), materials science, systems analysis, and thermal science and transfer processes. As part of this, Pratt requires a computer programming course (EGR 103L) which falls within the digital systems area. Depending on the major there may be an elective to assure that the four areas are covered.

Transferring from Trinity: The requirements presented below are for students who enter the Pratt School of Engineering upon matriculation at Duke. For students who transfer to the Pratt School from Trinity College the degree requirements remain the same, though the specific courses which are applied to satisfy those requirements may differ.

Course Credit Limitations

The 34 course credits used to meet BSE degree requirements have the following limitations:

- No more than 1.0 course credits in physical education activity may be used.
- No more than 1.0 course credits in music activity may be used.
- No house courses may be used.

[9] http://www.pratt.duke.edu/undergrad/degree-programs/general-requirements

- No more than 2.0 course credits of junior- or senior-level air science, military science, or naval science coursework may be used

BSE Common Core

The following courses are required of all majors in Pratt.

Undergraduate Writing

All majors in Pratt must take

WRITING 101 (20) Academic Writing

This course is required of all students at Duke during their first year. Duke will designate half of the incoming class to enroll in WRITING 101 in the fall and the other half in the spring. It is not possible for students to select which semester to take this course nor to switch semesters.

Social Sciences and Humanities (SS/H) Electives

All majors in Pratt must take five (5) humanities and social science courses from approved[10] departments and programs subject to the following requirements:

- **Social Science**: At least one course must be a Social Science (SS).
- **Breadth**: At least two of the following three areas of knowledge must be covered: Arts, Literature, and Performance (ALP), Civilizations (CZ), and Foreign Language (FL).
- **Depth**: At least two courses must be taken from the same approved department or program with at least one of the two courses at 200-level or higher.

and subject to the following restrictions:

- Courses utilized to meet the social science and breadth components can contribute only a single area of knowledge code even if the course possesses multiple codes, thus, a total of three unique courses will be required.
- A maximum of two AP credits can be used
- AP credit cannot be used to meet the "200-level or higher"-component of the depth requirement
- Skill courses cannot be used
- Courses must be from, or cross-listed[11] with, an approved department or program.

This set of general education requirements incorporate elements of breadth and depth.

Approved Departments and Programs: Non-social science and non-humanities departments (including some engineering courses) apply for and receive SS, CZ, or ALP codes for some of their courses. Effective Fall 2013, the Pratt school requires that SS/H courses must be taken from, or cross-listed with, an approved department or program (see Appendix A).

Chemistry

All majors in Pratt are required to take one of the following two chemistry courses:

CHEM 101DL (31L)	Core Concepts in Chemistry
CHEM 110DL (43L)	Honors Chemistry: Core Concepts in Context

[10] See Appendix A for a listing of approved humanities and social science departments and programs.
[11] EGR 305, even though cross-listed with ECON, may *not* be used toward the SS/H requirement.

AP Credit (CE, EnvE): AP credit for either CHEM 20 (18) or CHEM 21 (19) may be used to satisfy this requirement.

Physics

All majors in Pratt are required to take the following physics courses:

PHYSICS 151L (61L)	Introductory Mechanics
PHYSICS 152L (62L)	Introductory Electricity, Magnetism, and Optics

and at least one physics course must be taken at Duke.

AP Credit: AP credit for PHYSICS 25 (61) may be used in place of PHYSICS 151L (61L).

AP Credit: AP credit for PHYSICS 26 (62) may be used in place of PHYSICS 152L (61L).

Physics Course @ Duke: To satisfy the physics requirement, students must take (or have AP credit for) PHYSICS 151L (61L) and 152L (62L), and at least one physics course must be taken at Duke. If a student has AP credit for both PHYSICS 25 (61) & 26 (62), then one of PHYSICS 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for PHYSICS 26 (62) can be waived by taking PHYSICS 152L (62L). You do not have the option of taking PHYSICS 151 (61) and then using AP credit for PHYSICS 26 (62)--unless the *only* physics AP credit you have is for PHYSICS 26 (62).

Mathematics

All majors in Pratt must take the following math courses (unless double majoring in math, see below):

MATH 111L (31L)	Laboratory Calculus I	(differential calculus)
MATH 112L (32L)	Laboratory Calculus II	(integral calculus)
MATH 212 (103)	Multivariable Calculus	
MATH 216 (107)	Linear Algebra and Differential Equations	
MATH 353 (108)	Ordinary and Partial Differential Equations	

AP Credit: AP credit for MATH 21 (31) is accepted in lieu of MATH 111L (31L).

AP Credit: AP credit for MATH 22 (32) is accepted in lieu of MATH 112L (32L).

Placement – Q&A: Common questions concerning mathematics placement[12] are answered at the Department of Mathematics website.

Placement – MATH 21 (31) only math AP: Enroll in MATH 122L.

Placement - Skipped Math Courses: If students are advised by the mathematics department to skip any courses in the math sequence listed above, those students must replace the skipped courses with additional math courses approved by the CEE DUS. The total number of math courses taken at Duke plus the number of math AP or transfer credits must be at least five. Approved math classes include: MATH 230 (135), 333 (181), 342 (136), 361S (160S), 451S

[12] http://math.duke.edu/first_year/placement.html

(132S), 453 (133), 541 (216). CE and EnvE majors are permitted to count their statistics requirement (STA 130) as a math course, if they were instructed to skip a math course.

STA 130 requirement: The STA 130 requirement may be satisfied by completing both MATH 230 (Probability) and MATH 342 (Statistics).

Math Double Majors: Students wishing to double major with mathematics will need to take MATH 111L (31L), MATH 112L (32L), either [MATH 212 (103) and MATH 221 (104)] or [MATH 221 (104) and MATH 222 (105)], MATH 356 (131), and MATH 453 (133). In comparison to the engineering math sequence, MATH 221 (104) and MATH 356 (131) are substituting for MATH 216 (107), and MATH 453 (133) is substituting for MATH 353(108). *Once a student starts the double major math sequence by taking MATH 221 (104), they must complete it; they cannot switch back to the engineering math sequence.*

Digital Computation and Computer Programming

All majors in Pratt must take the following course during the first year:

EGR 103L (53L)	Computational Methods in Engineering	(MATLAB)

CE Requirements

BSE Common Core

All CE majors must complete the BSE common core courses specified above.

CE Core

All CE majors must take the following courses:

EGR 120L	Introduction to Structural Engineering	
EGR 201L	Mechanics of Solids	
EGR 206	Engineering Communication	(0.5 unit)
EGR 244L	Dynamics	
EGR 305	Engineering Systems Optimization and Economics	
CEE 160L	Introduction to Environmental Engineering and Science	
CEE 201L	Uncertainty, Design, and Optimization	
CEE 205	Practical Methods in Civil Engineering	(0.5 unit)
CEE 301L	Fluid Mechanics	
CEE 302L	Introduction to Soil Mechanics	
STA 130	Probability and Statistics in Engineering	

Introductory Courses: CEE 160L (environmental) and EGR 120L (structural) must be taken during the first or sophomore year. If not, they must be replaced with upper-level courses in the corresponding discipline area. Appendix D provides a listing of upper-level environmental and structural courses.

AP Credit: AP credit for statistics *cannot* be used to satisfy the STA 130 requirement.

CE Track

All CE majors must complete at least one track concentration: structural engineering and mechanics (S/M) or environmental engineering and water resources (E/W). Each track consists of four courses.

CE majors choosing the structural engineering and mechanics (S/M) track must complete:

CEE 421L	Matrix Structural Analysis
CEE 422L	Concrete and Composite Structures
CEE 423L	Metallic Structures
CEE 429	Integrated Structural Design

CE majors choosing the environmental engineering and water resources (E/W) track must complete:

CEE 461L	Chemical Principles in Environmental Engineering
CEE 462L	Biological Principles in Environmental Engineering
CEE 463L	Water Resources Engineering
CEE 469	Integrated Environmental Design

Natural Science Elective

The spirit of this requirement for CE majors is that students should have broad exposure to science including chemistry, physics, and one additional area of natural science.

All CE majors must complete the natural science elective requirement by taking one of the following courses:

BIOLOGY 201DL (101L)	Gateway to Biology: Molecular Biology
BIOLOGY 215/215L (105)	Introduction to Mathematical Modeling in Biology
BIOLOGY 275A (144)	Biology for Engineers: Informing Engineering Decisions (@ NSOE Marine Lab in Beaufort, NC)
BIOLOGY 311 (147)	Systems Biology: An Intro. for the Quantitative Sciences
EOS 101 (11)	The Dynamic Earth
EOS 102 (12)	The Dynamic Oceans
EOS 201L (101L)	The Solid Earth: Minerals, Rocks, and Structural Geology
EOS 202 (102)	Ocean and Atmospheric Dynamics
EOS 370A	Introduction to Physical Oceanography (@ NSOE Marine Lab in Beaufort, NC)

AP Credit: AP credit for Biology may be used to satisfy this requirement.

Transfer Credit: With prior DUS approval, it may be possible to utilize transfer credit to satisfy the NS elective requirement.

Engineering and Applied Science Elective

All CE majors must complete the engineering and applied sciences elective by completing one of the following courses (this list is supplemented with additional courses depending on the selected track, see below):

BME 253L (153L)	Biomedical Electronic Measurements I
CEE 307 (207)	Transport Phenomena in Biological Systems
CEE 560 (208)	Environmental Transport Phenomena
CEE 581 (245)	Pollutant Transport Systems
COMPSCI 201 (100)	Data Structures and Algorithms
ECE 110L (27L)	Fundamentals of Electrical and Computer Engineering
ECE 311 (176)	Thermal Physics
EGR 224L (119L)	Electrical Fundamentals of Mechatronics
ME 221L (83L)	Structure and Properties of Solids
ME 331L (101L)	Thermodynamics
PHYSICS 271L (171L)	Electronics

S/M Track: Students completing the S/M track may also select from the following three courses:

CEE 461L (120L)	Chemical Principles in Environmental Engineering
CEE 462L (124L)	Biological Principles in Environmental Engineering
CEE 463L (123L)	Water Resources Engineering

E/W Track: Students completing the E/W track may also select from the following three courses:

CEE 421L (131L)	Matrix Structural Analysis
CEE 422L (133L)	Concrete and Composite Structures
CEE 423L (134L)	Metallic Structures

CEE Elective

All CE majors must take a CEE elective at the 300 level, or higher. This course requirement may be used to provide additional technical breadth or depth depending on the needs and interests of the individual student.

Interinstitutional Registration Agreement: The Interinstitutional Registration Agreement[13] affords you the opportunity to take courses at select regional universities including North Carolina State University (NCSU). NCSU courses that might be of interest to you for satisfying this elective include Traffic Engineering, Mechanical and Electrical Systems in Buildings, Building Construction Engineering, and Introduction to Coastal and Ocean Engineering. Information about these and additional CEE courses at NCSU[14] is available on NCSU's Department of Civil, Construction, and Environmental Engineering website.

Free Electives

All CE majors must have two (2) course credits of free electives. See Course Credit Limitations on page 11.

Graduate School: Students planning to attend graduate school are strongly advised to use the free electives to take at least one additional CEE elective (making two in total), with at least one of them at the 500 level, or higher.

Satisfactory/Unsatisfactory: Free electives are the only courses counted toward degree requirements that may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

EI Code

Requirement varies according to matriculation date.

Matriculation during or after Fall 2014:
All CE majors must possess one ethical inquiry (EI) code among the 34 units used to meet degree requirements.

Matriculation prior to Fall 2014:
No EI code requirement.

[13] http://registrar.duke.edu/special-registrations/interinstitutional-registration
[14] http://www2.acs.ncsu.edu/reg_records/crs_cat/dir_CE.html

Courses Comprising the CE Major

There are occasions, particularly with certificate programs, when the number of courses that can double count toward another program (major, minor, or certificate) is limited in number (often two courses). In this context, the courses that comprise the CE major are as follows:

EGR 206 (150) [0.5 units]
EGR 244L (123L)
CEE 201L (130L)
CEE 205 (100) [0.5 units]
CEE 301L (122L)
CEE 302L (139L)
CEE Elective
If S/M Track: CEE 421L (131L), CEE 422L (133L), CEE 423L (134L), and CEE 429 (192)
If E/W Track: CEE 461L (120L), CEE 462L (124L), CEE 463L (123L), and CEE 469 (193)

EnvE Requirements

BSE Common Core

All EnvE majors must complete the BSE common core courses specified above.

EnvE Core

All EnvE majors must take the following courses:

EGR 201L	Mechanics of Solids	
EGR 206	Engineering Communication [0.5 unit]	
EGR 244L	Dynamics	
CEE 160L	Introduction to Environmental Engineering and Science	
CEE 205	Practical Methods in Civil Engineering [0.5 unit]	
CEE 301L	Fluid Mechanics	
CEE 302L	Soil Mechanics	(see **CEE 302L** note)
CEE 461L	Chemical Principles in Environmental Engineering	
CEE 462L	Biological Principles in Environmental Engineering	
CEE 463L	Water Resources Engineering	
CEE 469	Integrated Environmental Design	
CEE 560	Environmental Transport Phenomena	
BIOLOGY 201L	Gateway to Biology: Molecular Biology	(see **BIOLOGY 201L** note)
ME 331L	Thermodynamics	(see **ME 331L** note)
STA 130	Probability and Statistics in Engineering	

CEE 160L: CEE 160L must be taken during the first or sophomore year. If not, it must be replaced with an upper-level environmental course.

BIOLOGY 201L: BIOLOGY 201L may be replaced with an approved biology course. AP credit for Biology may be used in lieu of this requirement.

CEE 302L: CEE 302L may be replaced with an approved soil physics or earth science course.

ME 331L: ME 331L may be replaced with an approved thermodynamics course.

AP Credit: AP credit for Biology may be used to satisfy the BIOLOGY 201DL requirement.

AP Credit: AP credit for statistics *cannot* be used to satisfy the STA 130 requirement.

Systems Elective

All EnvE majors must take one of the following two courses:

CEE 201L	Uncertainty, Design, and Optimization
EGR 305	Engineering Systems Optimization and Economics

Environmental Science Elective

All EnvE majors must take *one* (1) of the following environmental engineering and environmental science courses:

CHEM 201D	Organic Chemistry I

CHEM 202L	Organic Chemistry II
CEE 563	Chemical Fate of Organic Compounds
CEE 566	Environmental Microbiology
CEE 661L	Environmental Molecular Biotechnology
CEE 666	Aquatic Geochemistry
ENVIRON 382LA	Marine Molecular Ecology
ENVIRON 383LA	Marine Molecular Microbiology
ENVIRON 543A	Environmental Biochemistry: Respiratory Proteins and the Environment
ENVIRON 573A	Coastal Ecotoxicology and Pollution

Transport Elective

All EnvE must take *one* (1) of the following environmental engineering transport courses:

BME 307/CEE307	Transport Phenomena: Biological Systems
CEE 569	Intro to Atmospheric Aerosols
CEE 581	Pollutant Transport Systems
CEE 683	Groundwater Hydrology
CEE 684	Physical Hydrology, Hydrometeorology
EOS 272A	Analysis of Ocean Ecosystems
EOS 315	Waves, Beaches, and Coastline Dynamics
EOS 323	Hydrogeology
ENVIRON 370A	Biological Oceanography
ENVIRON 535	Air Quality Management
ENVIRON 585A	Fisheries Ecology

Unit Operation and Design Elective

All EnvE majors must take *one* (1) of the following environmental engineering transport courses:

CEE 315	Engineering Sustainable Design and the Global Community
CEE 571	Control of Hazardous and Toxic Waste
CEE 575	Air Pollution Control Engineering
CEE 671	Physiochemical Unit Operations in Water Treatment
CEE 672	Solid Waste Engineering
CEE 685	Water Supply Engineering Design
EGR 424L	Energy & the Environment Capstone

Free Elective

All EnvE majors must have *one* (1) course credit of free elective. See Course Credit Limitations on page 11.

Graduate School: Students planning to attend graduate school are strongly advised to take at least two CEE courses at the 500 level, or higher.

Satisfactory/Unsatisfactory: Free electives are the only courses counted toward degree requirements that may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

EI Code

Requirement varies according to matriculation date.

Matriculation during or after Fall 2014:
All EnvE majors must possess one ethical inquiry (EI) code among the 34 units used to meet degree requirements.

Matriculation prior to Fall 2014:
No EI code requirement.

Courses Comprising the EnvE Major

There are occasions, particularly with certificate programs, when the number of courses that can double count toward another program (major, minor, or certificate) is limited in number (often two courses). In this context, the courses that comprise the EnvE major are as follows:

EGR 206 (150)	[0.5 units]
EGR 244L (123L)	
CEE 205 (100)	[0.5 units]
CEE 301L (122L)	
CEE 302L (139L)	
CEE 461L (120L)	
CEE 462L (124L)	
CEE 463L (123L)	
CEE 469 (193)	
CEE 560 (208)	
Environmental Science elective	
Transport elective	
Unit Operation and Design elective	

Planning for Study Abroad

A number of CE and EnvE students take the option to study abroad for a semester and a majority of those students study abroad in the fall semester of junior year. Fewer students go in the spring semester of junior year, and there are a few students who go during sophomore year to the Duke in Berlin program.

Fall junior year provides the greatest flexibility to accommodate CE and EnvE students studying abroad. Courses used to fulfill the Engineering & Applied Science elective (for example, thermodynamics, materials science), fluid mechanics, and some of the natural science electives are fairly common to engineering curricula around the world, and can often be taken abroad.

The Global Education Office[15] holds an information session on an evening in October, and all interested Pratt students, especially sophomores, should attend. The session is announced in advanced by email and is held within Pratt facilities. Students who plan to study abroad should also have individual meeting with staff from the Global Education Office.

Note that there are policies[16] on study abroad including grade point average and academic standing.

Considerable advance planning is required, and it helps if the student is at least a little ahead due to AP credit. Initial planning for study abroad should usually include more than one locale and final planning should include multiple curricular choices since, unlike at US universities, courses at foreign universities are sometimes suddenly and unexpectedly cancelled or subject to significant content change without warning.

CE and EnvE students may take two courses abroad related to the major. The remainder of courses taken abroad may fulfill other requirements. No more than two courses can be taken in place of required CE departmental courses. In special cases, with prior approval of the Director of Undergraduate Studies (DUS), students may take two required courses plus a technical elective required for the major (CE: upper level CEE elective; EnvE: transport elective, environmental science elective, or unit operation and design elective). The latter case might occur when there is an opportunity to study a subject not normally offered at Duke, or a course to fulfill a certificate requirement that goes beyond the basic CE or EnvE curriculum.

The Global Education Office maintains a database[17] of study abroad courses that have been pre-approved as equivalent Duke courses. Any courses non within the database must be pre-approved[18] by the GEO office (which will involve the appropriate DUS) if they are to be transferred back to Duke for credit.

Courses Not in the Global Education Database: To obtain approval from the DUS for a course not in the Global Education database, the following information is required: course title, descriptive paragraph, a detailed syllabus, the name and author of the required text(s),

[15] http://globaled.duke.edu/
[16] http://globaled.duke.edu/getting_started/study_abroad_policies
[17] http://globaled.duke.edu/for_students/Academics/Course_Approval_Database
[18] http://globaled.duke.edu/for_students/Academics/Course_Equivalencies

the year-level of the course at that university (e.g., taken by 3rd year students), and whether the course has a laboratory and if so how often it meets. Students are forewarned that while this information is usually fairly easy to obtain from US universities, it is often more challenging when dealing with foreign universities, and so it is important to start gathering this information in advance. The Global Education Office may be helpful if you encounter difficulty obtaining information. Understand that the DUS will be unwilling to search for this information on your behalf, and needs to be presented with a complete package with easy access to all information (electronically or hard copy). Also note that there is no guarantee that a particular university will offer the desired courses, or that they are offered in the appropriate semester, so the student must adjust plans accordingly.

Courses with a Laboratory Component: The majority of CE required courses involve a laboratory component, designated by "L" following the number in the course designation. Often technical courses abroad do not have a laboratory component, or the "lab" is minimal or inadequate. In this common occurrence, the student must make up the lab component of the course upon return to Duke, during the next semester if at all possible. To do so, the student does not register for the Duke course, but rather contacts the instructor and arranges to attend one of the laboratory sections. CEE faculty are familiar with this arrangement, but the student should contact the DUS if a problem arises. The student must participate in all laboratory aspects of the course, e.g. working in a lab group, taking and analyzing data, writing lab reports, etc. When the lab period is used for a non-laboratory purpose, such as homework help sessions, test review, testing, etc., then the student is not obligated to attend. At the end of the semester, the course instructor must send an email to the DUS and the Academic Dean stating that the student participated in and passed (hopefully…) all aspects of the laboratory portion of the course. The instructor is not required to submit a letter grade. Only when this has occurred will the credit for the study abroad course appear on the transcript.

Civil Engineering (CE)

The CE curriculum affords any student the opportunity to study abroad in the fall of the junior, with a little planning. Students are always able to pursue study abroad during the summer semester. Many popular institutions for study-abroad offer technical courses that are pre-approved for Duke CE requirements. Alternatively, students can modify the typical CE course sequence in order to take social science and humanities electives when they are abroad.

For study abroad in the junior fall without any engineering courses, which is not necessary depending on the institution selected, you may

- Move fluid mechanics (CEE 301L (122L)) to sophomore spring. Note that CEE 301L (122L) has co-requisites of MATH 353 (108) and EGR 244L (123L), which are easily met if you have AP credit for MATH 21 (31).
- Move systems optimization & economics (EGR 305 (115)) to senior fall.
- S/M Track: Move matrix structural analysis (CEE 421L(131L)) to senior fall
- E/W Track: Move chemical principles (CEE 461L (120L)) to senior fall.

Environmental Engineering (EnvE)

The EnvE curriculum affords any student the opportunity to study abroad in the fall of the junior, with a little planning. Students are always able to pursue study abroad during the summer semester. Many popular institutions for study-abroad offer technical courses that are pre-approved for Duke EnvE requirements. Alternatively, students can modify the typical course sequence in order to take social science and humanities electives when they are abroad.

For study abroad in the junior fall without any engineering courses, which is not necessary depending on the institution selected, you may

- Move fluid mechanics (CEE 301L (122L)) to sophomore spring. Note that CEE 301L (122L) has co-requisites of MATH 353 (108) and EGR 244L (123L), which are easily met if you have AP credit for MATH 21 (31).
- Move chemical principles (CEE 461L (120L)) to senior fall.

Get Involved

Getting involved in extracurricular activities related to your major is an excellent opportunity to gain related experience and demonstrate your affinity for your major which can be looked upon favorably by potential employers. Getting involved as a first-year or sophomore is a convenient means by which to get to know upper-class students. In some instances, ASCE in particular, scholarship and award opportunities exist for actively involved members.

To obtain the greatest benefit by getting involved it is best to participate actively over an extended period of time (be thinking leadership positions in these organizations) in one or two activities as opposed to spreading yourself too thin over many activities.

American Society of Civil Engineers (ASCE)

Duke's Student Chapter of the American Society of Civil Engineers[19] (ASCE) provides students with opportunities to participate in hands-on civil engineering competitions, to build relationships with other civil engineering students and faculty, and to learn about and get involved in civil engineering industries. Their main activities include preparing for the annual Carolinas Conference, where they compete in the Steel Bridge and Concrete Canoe competitions, among others.

Duke Engineers for International Development (DEID)

Duke Engineers for International Development[20] (DEID) is a student organization in the Pratt School of Engineering. Every year, DEID sends several groups of Duke students to locations around the globe to assess and implement engineering projects in the developing world. After working with communities to identify their needs, student teams collaborate with professors and professional mentors during the school year to design solutions that are then implemented in the upcoming summer. Students spend from several weeks to two months on-site with responsibilities ranging from project management to physical labor.

Engineering Student Government (ESG)

The mission of Engineering Student Government[21] (ESG) is to represent the engineering student body in all matters related to the Pratt School of Engineering. We act as a conduit between the administration and students, provide support to engineering clubs and societies, and work to create a social outlet for engineers throughout the academic year.

Internships

Information on internship and employment opportunities is posted on the website of the Duke University Career Center.[22] In addition to maintaining the websites mentioned above, the Career Center organizes various career-related activities that include: (a) career advising

[19] http://dukeasce.wordpress.com/
[20] http://sites.duke.edu/deid/
[21] http://esg.pratt.duke.edu/
[22] http://www.studentaffairs.duke.edu/career

sessions, (b) career skills workshops, (c) providing information about specific industries and opportunities (d) alumni connections, and (e) seminars on internships and employment that are specific for engineering. The workshops and seminars are announced via emails and posted on the TV monitors in the engineering buildings.

The Career Center is located in Smith Warehouse at 114 S. Buchanan Blvd, Bay 5, 2nd Floor, and may be reached at 919-660-1050.

In addition to the Career Center, the Associate Dean of Corporate and Industry Relations in the Pratt School of Engineering, Russell Holloway,[23] can help Pratt students connect with corporations for potential internship opportunities. For more information on internship opportunities, see this webpage.[24]

In the event that information on internships, employment, and/or graduate school opportunities is sent directly to CEE faculty or the department, that information will be distributed to declared CE and EnvE students via email.

[23] russell.holloway@duke.edu
[24] http://www.pratt.duke.edu/undergraduate-internship

Research Opportunities

There are two types of research opportunities for undergraduates: CEE independent study taken on a semester-by-semester basis and the Pratt Fellows program. Each opportunity has its own advantages and disadvantages, depending on the needs of the particular student, and these will be discussed below. Either research experience (provided at least 1.0 unit) may be utilized to meet Graduation with Departmental Distinction requirements and/or requirements for the Grand Challenge Scholars program.

There are several educational benefits to doing a research project. Beyond learning new project-related material, such projects typically require the student to draw on knowledge from a range of engineering disciplines, very similar to the work experience of professional engineers. Research projects typically pose more complex problems than found in a typical course setting, often with several viable solutions. Working with a faculty mentor is also an opportunity to get to know them personally, observe their thinking process and problem solving strategies, and likely see creative approaches being developed. The greatest gain occurs when both the student and the advisor share a strong commitment to the project.

Students are strongly advised to enter any type of research project with a clear understanding of the overall level of commitment. It is important to have an up-front understanding with the faculty advisor/mentor about the following: project goals and schedule; basis for grading; expected number of hours per week; frequency of meetings; and whether the student will be working directly for the faculty member, or more for a postdoc or graduate student.

A common problem students experience with research projects is time management. Since the research project is often the largest project the student has undertaken, there is a tendency to underestimate how much time and effort will really be required. Understandably, there is also a tendency to postpone project work due to short term deadlines in other courses. Without careful time management, the result can be a hasty ending without fully achieving goals.

Finally, with regard to research projects, the student is advised to consider the difference between working in a research lab, and actually doing research - the latter being the primary goal. One is doing research when one is sufficiently well versed in the activity to make intellectual contributions to the effort. To make such contributions requires intellectual maturity and dedication to the activity.

Independent Study

Civil Engineering (CE) and Environmental Engineering (EnvE) majors may take independent study courses for academic credit during their junior and senior year. The upper class years are the best time to undertake such activities, since the student has more intellectual maturity and a broader set of engineering skills to bring to bear on the project. Typically, CE and EnvE independent study activities are research related, although many have a significant design component.

CEE Independent work usually takes place during the fall-spring academic year, and may encompass a range of project types ranging from basic research activity to design and

development projects. An advantage is more flexibility with regard to project type, and the summer is left free for other activities such as internships, which are often most beneficial in the summer after junior year. A disadvantage can be short project duration, so it is best to have the independent study extend over more than one semester, giving adequate time to pursue the project in depth. Students should feel free to approach faculty members, whether or not they already know them, about independent work opportunities in areas of interest. Within a general area, the faculty member is often the best person to define the specific project and set realistic goals.

Pratt Fellows

The Pratt Fellows program involves a competitive selection process, and obligates the student to three academic semesters starting in the middle of junior year, plus a nine week paid summer commitment. Students apply to work on specific projects proposed by faculty in descriptive paragraphs. An advantage is that there is time for a very in-depth research experience, which can lead to a very positive experience. Also a strong research experience can be excellent preparation for graduate school. Disadvantages include being unavailable for a summer internship, and that a considerable time investment in one activity. On balance, the Pratt Fellows program is an excellent choice for students who wish to assess their interest and aptitude for in-depth research, and are planning to continue their education beyond the BSE degree.

NAE Grand Challenge Scholars

The NAE Grand Challenge (GC) Scholars Program[25] educates engineering undergraduates to have the technical expertise, breadth of knowledge, and the social, ethical, and environmental awareness to successfully pursue leadership positions in addressing the NAE Grand Challenges for Engineering.[26] This is accomplished by requiring each GC Scholar to propose and complete a five-component GC portfolio and GC senior thesis.

[25] http://www.pratt.duke.edu/undergrad/students/grand-challenge-scholars-program
[26] http://www.engineeringchallenges.org/

Second Major, Minor, and Certificate Programs

Opportunities exist for CE and EnvE students to combine their major with a second major, minor, or certificate. These additional programs can reside in either Pratt or Trinity.

Second Major: It is not uncommon for students to complete the requirements for a departmental major in arts and sciences while completing the requirements for a Bachelor of Science in Engineering (BSE) degree, or satisfy simultaneously the requirements for two engineering majors. The second major requirements typically consist of 10 courses comprised of specific and elective courses in the discipline which are required by the department for its primary majors.

Minors: Most of the departments in Trinity have established minors and engineering students are eligible to enroll in them. The courses required for minors are specified by the department/academic program. A minimum of five courses is required, including at least three above the introductory level.

Certificate Programs: Certificate programs are topically organized courses of study that offer a distinctive, usually interdisciplinary, approach to a subject matter not available within any single academic unit. A minimum of six courses are required.

To complete these additional programs, students must meet the requirements for their major plus the specific program requirements as outlined in the Bulletin of Undergraduate Instruction.[27]

It is common for there to be a restriction on the number of courses for any major, minor, or certificate that can double count for any other major, minor, or certificate. The BSE degree check sheets have been constructed to clearly indicate which courses are Pratt general education courses (for which there is no restriction on double counting) and courses required for the major (for which there is often a limitation on double counting).

Below are listings of "notable" second majors, minors, and certificates. They are notable only in that recent CE or EnvE majors have completed these programs.

Notable Second Majors

- Biomedical Engineering
- Economics
- Environmental Science
- Language (e.g., German, Russian, Spanish)
- Public Policy Studies

Notable Certificates

- Architectural Engineering
- Energy and the Environment
- Global Health
- Markets and Management Studies

[27] http://registrar.duke.edu/bulletins/undergraduate/

Marine Science and Conservation Leadership

Notable Minors

Art
Asian and Middle Eastern Studies
Chemistry
Earth and Ocean Sciences
Economics
English
Environmental Science
Language (e.g., German, Russian, Spanish)
Mathematics
Physics
Psychology
Religion
Sociology

Architectural Engineering Certificate

Architectural Engineering (AE) is the discipline concerned with the planning, design, construction and operation of engineered systems for commercial, industrial and institutional facilities. Duke's Certificate Program in Architectural Engineering provides students with an understanding of building design and the construction process.

Buildings have historically represented the culture of their time. From palace to post office, hotel to family home, buildings are physical examples of what was considered aesthetically proper and technologically most advanced at a given time. Today, modern buildings are composed of many different systems such as structural, enclosure, space, and environmental-control (heating-cooling-ventilation, electrical, water, sound control). As a result, designing a building is a complex task requiring the close collaboration of architects and engineers together in a design team. However, there has traditionally been a great difference between the role of the architect and that of the engineer, with the architect on the "creative" side of design and the engineer on the "practical" side. Architectural engineers, trained in practical and creative methods of problem solving and design, bridge this gap.

Requirements

Successful completion of six (6) required and two (2) elective courses are required for a certificate in Architectural Engineering.

Required Courses

CEE 311 (161)	Architectural Engineering I
CEE 411 (162)	Architectural Engineering II
CEE 422L (133L)	Concrete and Composite Structures
CEE 423L (134L)	Metallic Structures
ARTHIST 285 (189A), 285D (189AD), or 286D (189BD)	Modern/Postmodern Architecture
EGR 201L (75L)	Mechanics of Solids

Elective Courses

ARTSVIS 101(54)	Introduction to Visual Practice
CEE 201L (130L)	Uncertainty, Design, and Optimization
CEE 421L (131L)	Matrix Structural Analysis
CEE 190 (141)/390 (142)	Special Topics in Civil Engineering
CEE 429 (192)	Integrated Structural Design
CEE 491 (197)/492 (198)	Projects in Civil Engineering
EGR 120L (25L)	Introduction to Structural Engineering
EGR 206 (150)	Engineering Communication
EGR 357 (175)	Aesthetics, Design, and Culture

Note: CEE 491 (197) and 492 (198) must involve topics in the architectural engineering area, for one course credit work.

For more information contact the program director:

Chris Brasier, FAIA, LEED AP BD+C, MBA
Duke University, Adjunct Assistant Professor
Clark Nexsen, Design Director

chris.brasier@duke.edu

Have a Question?

There are various resources available to assist you including, but not limited to, this Handbook. Some of these additional resources are people and they are presented below as well as FAQs and information for students considering a transfer either to Pratt or to Trinity.

Who Can Help?

If you are unable to locate the factual answer to your question in this Handbook, including the Frequently Asked Questions below, or you are seeking personalized guidance or advice, the following resources available to you.

Faculty Advisor

Your assigned faculty advisor is your primary contact in regards to exploring the profession, advising on the overarching aspects of your academic plans, registering for courses, and strategizing over near-term career objectives. Though your advisor possesses a wealth of knowledge and experience and they have a lot to offer you, they likely will not possess the answers to all your questions. For example, they likely won't know what the work load is for a specific SS/H course. Utilize your faculty advisor for the types of information they are best suited to provide.

At times, some faculty members' travel schedules or other commitments may leave them unable to give each of their advisees as much time as is needed or desired, or academic issues may arise requiring the expertise of other faculty or administration. Under such circumstances, please contact the DUS.

E-Team (Peer Advisors)

The E-Team is comprised of upper-class engineering students who serve as Pratt's peer advisory group. They love to answer questions on classes, student groups, and life on campus, among others. You may reach members of the E-Team through the E-Team website.[28]

CEE Director of Undergraduate Studies (DUS)

Joseph Nadeau
173 Hudson Hall Annex
nadeau@duke.edu
919-660-5216

Joseph Nadeau

The Director of Undergraduate Studies (DUS) is responsible for monitoring and enforcing all aspects of the CEE undergraduate experience. These aspects include curricular requirements, advising, scheduling courses, and staffing teaching assistants. The DUS can assist you when, for example, your advisor cannot answer a question,

[28] http://www.pratt.duke.edu/undergrad/students/advising/e-team

you need course approvals related to study abroad or taking a course at another university, you have concerns about a course, you like a change in advisor.

If the DUS is unable to resolve your question or issue, you should contact your Academic Dean.

Academic Dean for CEE

Lupita Temiquel-McMillian
305 Teer Building
lupita.mcmillian@duke.edu
919-660-5996


Lupita Temiquel-McMillian

Your academic dean is Dean Lupita McMillian. Your academic dean can, for example, assist you in preparing four-year plans, discuss options if your are having a difficulty, approve overloads and underloads, explain Pratt policies and procedures, etc.

Duke CEE LinkedIn Group

Join and consult the Duke CEE Students, Alumni, and Faculty LinkedIn group.[29] This is a restricted group open only to Duke CEE students, alumni, and faculty.

Frequently Asked Questions (FAQs)

I'm interested in environmental engineering. How do I decide between CE-E/W and EnvE?

Most importantly, you can't make the wrong decision. In other words, both majors are going to open to same set of proverbial doors. Having said that, if you are interested in constructed environmental projects then you might want to lean in the direction of the civil engineering (CE) major with an environmental engineering and water resources emphasis. If you are interested in pursuing a graduate degree in environmental engineering then you might want to lean in the direction of the environmental engineering (EnvE) major. Just to be clear, CE majors can go to graduate school and EnvE majors can work on constructed environmental projects. In large part the decision comes down to which major resonates with you the most.

Can I transfer courses to Duke? If so, how do I do this?

Yes. The Pratt policy on transfer credits, and how the process works, is available at the Pratt Policies and Procedures webpage.[30]

Considering a Transfer to or from Pratt?

If you are contemplating a transfer, either Trinity to Pratt or Pratt to Trinity, you should schedule a meeting with Dean McMillian. Additional information is available at the Pratt Policies and Procedures webpage.[31]

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[29] https://www.linkedin.com/groups?gid=4982025
[30] http://www.pratt.duke.edu/undergrad/policies/3659
[31] http://www.pratt.duke.edu/undergrad/policies/3537

Could You Benefit from Some Support?

Academic Resource Center (ARC)

The Academic Resource Center[32] (ARC) offers a variety of programs and services to support the academic work of all Duke undergraduates. Services are provided through the Academic Skills Instructional Program (ASIP), the Peer Tutoring Program (PTP), and the Program for Students with Disabilities (PSD). Students may receive highly individualized support through any of the three ARC programs. Opportunities for students to learn in groups are also offered each semester. "Self-serve" learning resources are available on their website. There, students can assess their academic skills and learning styles using inventories and self-assessment surveys. Online learning strategy handouts are also provided to guide students' learning in courses. The professional staff members of the ARC collaborate to ensure that each student who visits or is referred to the Center receives information and services based on individual academic support needs.

Academic Accommodations

Duke University is prepared to make reasonable academic adjustments and accommodations to allow students with documented disabilities full participation in the same programs and activities available to students without disabilities. Additional information is available on the Pratt Policies and Procedures webpage.[33]

Counseling and Psychological Services (CAPS)

Counseling and Psychological Services[34] (CAPS) helps Duke students enhance strengths and develop abilities to successfully live, grow and learn in their personal and academic lives. They offer many services to Duke undergraduate, graduate, and professional students, including brief individual counseling/psychotherapy, consultation, couples and group counseling, assistance with referrals, and more. CAPS staff also provide outreach education programs to student groups, particularly programs supportive of at-risk populations, on a wide range of issues impacting them in various aspects of campus life.

The CAPS staff includes psychologists, clinical social workers, and psychiatrists experienced in working with college-age adults. From the everyday challenges of life to more profound impairment or "interruption" of daily functioning, they recognize that any student may face some level of challenge at any point in their careers here at Duke. Their work is guided by sensitivity to the needs of a diverse student body.

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[32] http://duke.edu/arc/
[33] http://www.pratt.duke.edu/undergrad/policies/3478
[34] http://studentaffairs.duke.edu/caps

Personal Emergencies and Additional Services

Information regarding personal emergencies[35] as well as additional services[36] are available on Pratt's Policy and Procedures webpage.

[35] http://www.pratt.duke.edu/undergrad/policies/3519
[36] http://www.pratt.duke.edu/undergrad/policies/3530

Want to Help?

There are several ways in which you may get involved that would benefit your peers, your department, and yourself. Some opportunities are paid while others are volunteer in nature.

Teaching Assistant

The CEE department frequently hires qualified undergraduate students to be teaching assistants for several courses administered by the department. These courses include, but are not necessarily limited to, the following

CEE 201L	Uncertainty, Design, and Optimization	spring
CEE 302L	Introduction to Soil Mechanics	spring
CEE 311	Architectural Engineering I	fall
CEE 411	Architectural Engineering II	spring
CEE 422L	Concrete and Composite Structures	spring
CEE 423L	Metallic Structures	fall
EGR 120L	Introduction to Structural Engineering	spring
EGR 201L	Mechanics of Solids	fall, spring
EGR 206	Engineering Communication	spring
EGR 305	Engineering Systems and Optimization	fall

There is a brief online application which becomes available during the pre-registration period for the semester in question. If interested in applying, contact the DUS.

E-Team (Peer Advisors)

The E-Team is a group of upper-class peer advisors. This is a volunteer program. If you think you'd like to get involved contact Pratt's Undergraduate Program Coordinator, Lauren Stulgis, to learn more.

Pratt Tour Guide

Tour guides for Pratt introduce prospective Pratt students and their parents to Pratt programs and facilities. This is a paid position and there is typically a general call for applications in February. If you are interested in learning more about being a tour guide contact Pratt's Undergraduate Program Coordinator, Lauren Stulgis.

Pratt Events

There are several occasions throughout the year when Pratt hosts large groups of visitors. Blue Devil Days and Pratt in Focus are examples of such events. Would you like to volunteer your time and enthusiasm (often in exchange for lunch and a T-shirt) to help welcome these visitors to Pratt and assist them in making the most of their time while here? If so, please contact Pratt's Undergraduate Program Coordinator, Lauren Stulgis, to learn more.

DukeReach

DukeReach directs students, faculty, staff, parents and others to the resources available to help a student in need. Services participating in DukeReach come from across campus.

Are you concerned about your physical or mental health? Has a student's behavior caused you to worry about his or her potential future actions? Through the DukeReach website they hope to provide you with the resources you need to assist a student or, get the appropriate help so that someone else may do so.

Transitioning Beyond Your BSE

Fundamentals of Engineering (FE) Exam

All CE and EnvE majors are *highly* encouraged to take the Fundamentals of Engineering (FE) exam[37] before graduating.

The FE exam is one of the first steps in the process of earning a Professional Engineer (PE) license. A PE license is required in many instances for the practice of engineering akin to passing the bar to practice law and becoming licensed to practice medicine.

The FE exam is broad in coverage and the ease with which the exam can be passed is greatly enhanced by taking the exam before graduating while the fundamentals upon which it is based is fresh in your mind. In statistics maintained by NCEES, the percentage of takers who pass the exam diminishes significantly the longer someone waits to take the exam after graduating. Take the exam during your senior year!

The FE exam is administered by National Council of Examiners for Engineering and Surveying (NCEES) and is valid for subsequent PE licensing in all states. The requirements and licensing as a PE, however, varies by state. The FE exam is computer-based and administered year-round at NCEES-approved Pearson VUE test centers. There are two such testing locations within 20 miles of campus, one in Durham and one in Raleigh. Exams are scheduled in a six-hour window during the months of January-February, April-May, July-August, and October-November. The exam consists of 110 multiple choice questions and the fee is approximately $225 (study aids, etc. are an additional expenses).

The January-February exam period is probably the ideal period to take the FE exam. You will have completed the majority of your technical coursework and yet the time frame is sufficiently far removed from the often hectic end of the senior spring semester.

If you are looking for a way to prepare for the exam then one recommendation is to use a review manual available through various publishers. One such publisher is Professional Publications, Inc.[38]

Are you considering skipping the FE exam? The path of one's career is likely to consist of some unanticipated arcs, turns, and perhaps even turnabouts. You may not be expecting to need the FE exam at this time but that *could* change. A few years ago a CE student was going into investment banking after graduating and didn't take the FE exam, despite pleas—such as those here—to do so. As you might be imagining, investment banking turned out not to be the perfect match for this student and she decided after a few years to return to her major and pursue a career in civil engineering. Pursuing this path is aided by having taken and passed the FE exam so this is what that student then embarked on. Studying for the FE exam a few years after graduation can be rewarding but I suspect most people would prefer to do something

[37] http://ncees.org/exams/fe-exam/
[38] http://ppi2pass.com/

else. Cover your bases and take the FE exam before you graduate while you are best prepared. Please.

Employment Information

Information on internship and employment opportunities is posted on the website of the Duke University Career Center.[39] In addition to maintaining the websites mentioned above, the Career Center organizes various career-related activities that include: (a) career advising sessions, (b) career skills workshops, (c) providing information about specific industries and opportunities (d) alumni connections, and (e) seminars on internships and employment that are specific for engineering. The workshops and seminars are announced via emails and posted on the TV monitors in the engineering buildings. The Career Center is located in Smith Warehouse at 114 S. Buchanan Blvd, Bay 5, 2nd Floor, and may be reached at 919-660-1050.

In addition to the Career Center, Pratt's Associate Dean of Corporate and Industry Relations, Russell Holloway,[40] can help you connect with corporations for potential internship opportunities. For more information, visit the undergraduate internship webpage.[41]

In the event that information on internships, employment, and/or graduate school opportunities is sent directly to the CEE faculty or the department, that information will be distributed to declared CE and EnvE students via email.

Graduate and Professional School Information

One of your best sources of information on graduate school is your faculty advisor and the Director of Graduate Studies.

Advising for professional (medical, law, business) programs is available through Trinity's Academic Advising Center's pre-professional advisors.[42]

4+1: BSE+MS/MEng/MEM Program

The 4+1 program offers a five-year combined Bachelor of Science in Engineering (BSE) degree and a master's degree. There are three options for the master's degree: Master of Science (MS), Master of Engineering (MEng), or Master of Engineering Management (MEM) degree. This program is a great opportunity for students who want to broaden their undergraduate research experience or to obtain advanced training in civil or environmental engineering. With the MEng and MEM degrees technical courses are supplemented with business-related courses. More information about all three 4+1 programs is provided at the 4+1 webpage[43] and a comparison of the graduate degrees can be found here.[44]

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[39] http://www.studentaffairs.duke.edu/career
[40] russell.holloway@duke.edu
[41] http://www.pratt.duke.edu/undergraduate-internship
[42] http://advising.duke.edu/preprofessional
[43] http://www.pratt.duke.edu/undergrad/degree-programs/bse-masters
[44] http://www.pratt.duke.edu/grad

The combined degrees require that the students fulfill the standard degree requirements for the Bachelor of Science in Engineering plus an additional 30 suitable graduate units[45] (10 courses) of upper-level courses for the master's degree. The number of graduate units that can be completed during the senior year varies depending on the specific master's degree that is sought. Courses cannot be applied to both the BSE degree and the master's degree, and undergraduate Independent Study courses cannot be applied toward the master's degree requirements. Completing two or more graduate courses in your senior year (for which you do *not* pay *graduate* tuition) enables you to easily complete the remaining 8 graduate courses in one year beyond your BSE.

The MS degree is awarded by the Graduate School and both the MEng and MEM degrees are awarded by the Pratt School of Engineering. Because of this and other factors there are differences in the requirements for each of the three 4+1 program. Details can be found on the individual program webpages but some of these differences are outlined below.

Take the GRE[46] in the fall of your senior year. A TOEFL[47] score may be required.

MS: A maximum of two graduate courses taken in the spring of your senior year can count toward your MS degree. Apply[48] for (provisional) spring admission to Duke's Graduate School during the fall of your senior year.

MEng or MEM: A maximum of four graduate courses taken your senior year (fall and/or spring) can count toward your MEng degree. You can apply[49] as early as spring of your junior year to as late as spring of your senior year.

[45] For graduate-level courses, a 3-hour/week course is a 3 graduate unit course. In other words, 3 graduate units is equivalent to 1 undergraduate unit.
[46] http://www.ets.org/gre/
[47] http://www.ets.org/toefl/
[48] http://gradschool.duke.edu/admissions/index.php
[49] http://meng.pratt.duke.edu/how-to-apply

CEE Honors and Awards

Graduation with Departmental Distinction (GwDD)

Graduation with Departmental Distinction is awarded to students who, in the opinion of the CEE faculty as represented by the Honors and Awards Committee, have demonstrated exceptional achievement in the areas of their special interest by conducting independent research and presenting the research project with a distinguished piece of writing and an oral presentation. CE and EnvE students who have a final grade point average of 3.500 or higher and have successfully completed at least one unit of CEE independent study, which could be a part of the Pratt Fellows program or the NAE Grand Scholars program, are eligible to apply for the distinction.

Additional details can be found on the GwDD website.[50]

Chi Epsilon

Membership in Chi Epsilon, the national civil engineering honor society, recognizes academic achievement as well as demonstrated character, practicality, and sociability. The Duke University student chapter of Chi Epsilon was established in 1964. Students may be eligible for membership in their junior or senior year. Nominations are sent to prospective members in the fall of each year.

Aubrey Palmer Award

Professor Aubrey Palmer (May 29, 1912 – January 30, 1981) was one of the most loved and respected members of the School of Engineering faculty. He taught at Duke for over 37 years, touched many lives, and encouraged, challenged, and motivated hundreds of engineering students. This Award, established in 1980, is presented annually to a civil engineering senior, or seniors, in recognition of outstanding academic achievement.

Brewster Snow Award

This award, established in 1979, is presented annually to a senior, or seniors, who have demonstrated academic excellence, interest, and enthusiasm in the study of environmental engineering.

Eric I. Pas Award

This award, established in 1998 in memory of Dr. Eric Pas, former Director of Undergraduate Studies in Civil and Environmental Engineering, is presented to the graduating civil engineering senior judged by the faculty of the Department to have conducted the most outstanding independent study project.

[50] http://www.cee.duke.edu/undergrad/dept-distinction

ASCE Outstanding Senior Prize

The American Society of Civil Engineers (ASCE) Outstanding Senior Prize is presented annually to a graduating civil engineering senior, or seniors, in recognition of an exceptional, positive impact on the student chapter of ASCE. The award is selected by the Department's faculty and is sponsored by the North Carolina Section of ASCE. The award consists of a certificate that is awarded at the NC ASCE Section's Annual Meeting in the fall following graduation, and first year Associate Member dues in ASCE.

Other Honors at Duke

There are several other ways in which you may earn academic honors for your work. Details on dean's list, honor societies (e.g., Tau Beta Pi, Phi Beta Kappa), and Latin honors may be found at this Duke website.[51]

In addition, Pratt offers these awards:

The *Pratt School of Engineering Student Service Award*, establish in 1978, is given to the graduating senior who, by contributions of time, effort, and spirit, has significantly benefitted the community of the School of Engineering.

The *Otto Meier, Jr. Tau Beta Pi Award* is presented in recognition of Dr. Meier's leadership in establishing the North Carolina Gamma Chapter on January 10, 1948, and his continuous service until April 19, 1975, as Chapter Advisor. This award is given annually to the graduating Tau Beta Pi member who symbolized best the distinguished scholarship and exemplary character required for membership.

The *Walter J. Seeley Scholastic Award* is presented annually by the Engineering Student Government to the member of the graduating class of the School who has achieved the highest scholastic average in all subjects, and who has shown diligence in pursuit of an engineering education. The award was initiated to honor the spirit of academic excellence and professional diligence demonstrated by the late Dean Walter J. Seeley. The ESG hopes that this award will serve as a symbol of the man and the ideals for which he stood.

[51] http://trinity.duke.edu/undergraduate/academic-policies/honor-roll

Appendix A: Approved Social Science and Humanities Departments and Programs

In recent years there has been a proliferation of non-social science and non-humanities departments (including some engineering departments) applying for and receiving SS, CZ, or ALP Areas of Knowledge codes for some of their courses. These particular codes, therefore, are no longer exclusive to social science and humanities departments as they once were. Given that the five SS/H courses are intended to allow you to explore in breadth and depth disciplines of social sciences and humanities, the Pratt school requires (effective Fall 2013) that SS/H courses must be taken from, or cross-listed with, one of the following departments or programs (see the list of exceptions that follow):

Department/Program	**Subject Code(s)**
African & African American Studies	AAAS
Art, Art History, and Visual Media Studies	ARTHIST, HCVIS, ARTSVIS, VMS
Arts of the Moving Image	AMI
Asian and Middle Eastern Studies	AMES, ARABIC, CHINESE, HEBREW, HINDI,... JPN, KOREAN, PERSIAN, SANSKRIT, TIBETAN
Canadian Studies	CANADIAN
Classical Studies	CLST, GREEK, LATIN
Cultural Anthropology	CULANTH
Documentary Studies	DOCST
East Asian Studies	
Economics	ECON
Education	EDUC
English	ENGLISH
Study of Ethics	ETHICS
Evolutionary Anthropology	EVANTH
Germanic Languages and Literature	GERMAN
History	HISTORY
International Comparative Studies	ICS
Islamic Studies	ISLAMST
Jewish Studies	JEWISHST
Latin American Studies	LATAMER
Linguistics	LINGUIST
Literature Program in Global Cultural Studies	LIT
Markets and Management Studies	MMS
Medieval and Renaissance Studies	MEDREN
Music	MUSIC
Philosophy	PHIL
Political Science	POLSCI
Psychology and Neuroscience	PSY
Public Policy Studies	PUBPOL
Religious Studies	RELIGION

Romance Studies	ROMST, CREOLE, FRENCH, ITALIAN, PORTUGUE,... QUECHUA, SPANISH
Slavic and Eurasian Studies	SES, BALTFIN, POLISH, ROMANIAN, RUSSIAN,... SERBCRO, TURKISH, UKRAIN, UZBEK
Sociology	SOCIOL
Theater Studies	THEATRST
Women's Studies	WOMENST

Please note that, as illustrated above, individual departments and programs may constitute one *or more* subject codes.

EXCEPTIONS

EGR 305/ECON 212: Even though EGR 305 is cross-listed with ECON (within the economics department) it cannot be used toward the SS/H requirement.

Appendix B: BSE Degree Check Sheets

The check sheets presented below are intended to be a one-page overview of the BSE degree requirements for the applicable major. These check sheets can be used in lieu of the academic advisement report (at least as they pertain to BSE degree requirements) available to students through ACES and to advisors through STORM.

The language used within the check sheets is terse and is intended to serve as a crutch in recalling the specific requirements elaborated on in detail elsewhere in the Handbook.

Matriculation: F11, F12, F13

The degree check sheets on the following pages are applicable to students who matriculated in Fall 2011, Fall 2012, or Fall 2013.

As a suggestion in how one might complete the SS/H elective section of the check sheet please consider the following example. This is *not* a proposed plan of courses but rather an illustration of crossing out AoK codes that do not apply for courses taken and circling the codes that will be applied in order to satisfy the SS/H requirements in regards to having an SS course and completing two of the three areas: ALP, CZ, and FL. The depth requirement is indicated by filling the circles corresponding to the two courses from the same approved department or program where at least of the two is at the upper-level (200-level, or higher).

SS/H Electives		____ AoK ____	Depth
15.	HISTORY 18A _____	~~SS~~ ~~ALP~~ (CZ) ~~FL~~	○
16.	PSY 101_____	(SS) ~~ALP~~ ~~CZ~~ ~~FL~~	○
17.	ARTHIST 286D_____	~~SS~~ (ALP) CZ ~~FL~~	●
18.	ARTHIST 383_____	~~SS~~ ALP CZ ~~FL~~	●
19.	MUSIC 274S_____	~~SS~~ ALP ~~CZ~~ ~~FL~~	○

2010 Fall	AP	See **SS/H**
2011 Spring		See **SS/H**
2012 Fall		See **SS/H**
2013 Spring		See **SS/H**
2014 Spring		See **SS/H**

Matriculation: F11, F12, F13

Name:_____

	General Education (w/ CE restrictions & requirements)	**Semester**	**Grade**	**Notes**
1.	WRITING 101 (20) …….....			
2.	MATH 111L (31L) or 21 (31) ……....			
3.	MATH 112L (32L) or 22 (32) or 122L (41L) ……..……			
4.	MATH 212 (103) ……...			
5.	MATH 216 (107) ……..……			
6.	MATH 353 (108) ……...			
7..	STA 130 (113) ……...			
8.	CHEM 101DL (31L) or 20 (18) or 21(19) ……..……			
9.	PHYSICS 151L (61L) or 25 (61) ……..			See **Physics**
10.	PHYSICS 152L (62L) or 26 (62) ……..			See **Physics**
11.	EGR 103L (53L) ……...			E&AS: Digital systems
12.	EGR 120L (25L) or **upper-level** structural ……..……			120L in year 1 or 2 only
13.	EGR 201L (75L) ……...			E&AS: Mechanics-solids
14	EGR 305 (115) ……..			E&AS: Systems analysis
15	CEE 160L (24L) or **upper-level** environmental ……..			160L in year 1 or 2 only
	Science and Free Electives			
16.	NS Elective _____ ……...			See **NS**
17.	E&AS Elective _____ ……..			See **E&AS**
18.	_____[1 / 0.5] _____[- / 0.5]			See **Free**
19.	_____[1 / 0.5] _____[- / 0.5]			See **Free**
	SS/H Electives ____ AoK ____ Depth			
20.	_____ SS ALP CZ FL ○			See **SS/H**
21.	_____ SS ALP CZ FL ○			See **SS/H**
22.	_____ SS ALP CZ FL ○			See **SS/H**
23.	_____ SS ALP CZ FL ○			See **SS/H**
24.	_____ SS ALP CZ FL ○			See **SS/H**
	CE Major (limitations on double counting may apply)			
24.5	EGR 206 (150) [0.5] ……..			
25.5	EGR 244L (123L) ……..			
26.5	CEE 201L (130L) ……..			
27.	CEE 205 (100) [0.5] ……..			
28.	CEE 301L (122L) ……..			
29.	CEE 302L (139L) ……..			
30.	CEE 421L (131L) ……..			
31.	CEE 422L (133L) ……..			
32.	CEE 423L (134L) ……..			
33.	CEE 429 (192) ……..			
34.	CEE Elective _____ ……..			**Upper-level** CEE course

GENERAL NOTES: (1) This check sheet is terse; see Handbook for all details. (2) All courses are [1] unit, unless noted otherwise; (3) Highlighted items are unique to the S/M track. (4) All courses must be successfully completed; no more than 2 courses with grade of D-, D, or D+.

Physics: At least 1 physics course must be taken at Duke. If AP credit for both 25 (61) & 26 (62), then one of 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for 26 (62) can be waived by taking 152L (62L). Cannot take 151 (61) and use AP for 26 (62)--unless the only physics AP credit you have is for 26 (62).

NS: BIOLOGY 20 (19), 201L (101L), 215 (105), 275A (144), 311 (147), EOS 101 (11), 102 (12), 201L (101L), 202 (102), or 370A.

E&AS: BME 253L (153L), CEE 307 (207), 461L (120L), 462L (124L), 463L (123L), 560 (208), 581 (245), COMPSCI 201 (100E), ECE 110L (27L), 311 (176), EGR 224L (119L), ME 221L (83L), 331L (101L), or PHYSICS 271L (171L).

SS/H: 5 courses from approved departments or programs (see Handbook); limit of 2 APs. 1 SS; 2 of the 3 areas: ALP, CZ, FL; 2 from the same department or program where 1 (cannot be AP) is upper-level. Only 1 AoK code can be applied per course.

Upper-level: Engineering courses = 300-level or higher (100- or 200-level). SS/H courses = 200-level or higher (100- or 200-level).

Free: The only courses of the 34 that may be taken Satisfactory/Unsatisfactory (S/U) are free electives. Minimal limitations apply, see Handbook.

Matriculation: F11, F12, F13

Name:_____

	Pratt's General Education Courses (w/ some CE restrictions)	**Semester**	**Grade**	**Notes**
1.	WRITING 101 (20) ……..….			
2.	MATH 111L (31L) or 21 (31) ……....			
3.	MATH 112L (32L) or 22 (32) or 122L (41L) ……..……			
4.	MATH 212 (103) ……...			
5.	MATH 216 (107) ……..……			
6.	MATH 353 (108) ……...			
7.	STA 130 (113) ……...			
8.	CHEM 101DL (31L) or 20 (18) or 21(19) ……			
9.	PHYSICS 151L (61L) or 25 (61) …….			See **Physics**
10.	PHYSICS 152L (62L) or 26 (62) …….			See **Physics**
11.	EGR 103L (53L) ……...			E&AS: Digital systems
12.	EGR 120L (25L) or **upper-level** structural ……..……			120L in year 1 or 2 only
13.	EGR 201L (75L) ……...			E&AS: Mechanics-solids
14	EGR 305 (115) …….			E&AS: Systems analysis
15	CEE 160L (24L) or **upper-level** environmental …….			160L in year 1 or 2 only
	Science and Free Electives			
16.	NS Elective _____ ……...			See **NS**
17.	E&AS Elective _____ ……...			See **E&AS**
18.	_____[1 / 0.5] _____[- / 0.5]			See **Free**
19.	_____[1 / 0.5] _____[- / 0.5]			See **Free**
	SS/H Electives ____ AoK ____ Depth			
20.	_____ SS ALP CZ FL ○			See **SS/H**
21.	_____ SS ALP CZ FL ○			See **SS/H**
22.	_____ SS ALP CZ FL ○			See **SS/H**
23.	_____ SS ALP CZ FL ○			See **SS/H**
24.	_____ SS ALP CZ FL ○			See **SS/H**
	CE Major Courses			
24.5	EGR 206 (150) [0.5] …….			
25.5	EGR 244L (123L) ……			
26.5	CEE 201L (130L) ……			
27.	CEE 205 (100) [0.5] …….			
28.	CEE 301L (122L) ……			
29.	CEE 302L (139L) ……			
30.	CEE 461L (120L) ……			
31.	CEE 462L (124L) ……			
32.	CEE 463L (123L) ……			
33.	CEE 469 (193) ……			
34.	CEE Elective _____ ……			**Upper-level** CEE course

GENERAL NOTES: (1) This check sheet is terse; see Handbook for all details. (2) All courses are [1] unit, unless noted otherwise; (3) Highlighted items are unique to the E/W track. (4) All courses must be successfully completed; no more than 2 courses with grade of D-, D, or D+.

Physics: At least 1 physics course must be taken at Duke. If AP credit for both 25 (61) & 26 (62), then one of 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for 26 (62) can be waived by taking 152L (62L). Cannot take 151 (61) and use AP for 26 (62)--unless the only physics AP credit you have is for 26 (62).

NS: BIOLOGY 20 (19), 201L (101L), 215 (105), 275A (144), 311 (147), EOS 101 (11), 102 (12), 201L (101L), 202 (102), or 370A.

E&AS: BME 253L (153L), CEE 307 (207), 421L (131L), 422L (133L), 423L (134L)., 560 (208), 581 (245), COMPSCI 201 (100E), ECE 110L (27L), 311 (176), EGR 224L (119L), ME 221L (83L), 331L (101L), or PHYSICS 271L (171L).

SS/H: 5 courses from approved departments or programs (see Handbook); limit of 2 APs. 1 SS; 2 of the 3 areas: ALP, CZ, FL; 2 from the same department or program where 1 (cannot be AP) is upper-level. Only 1 AoK code can be applied per course.

Upper-level: Engineering courses = 300-level or higher (100- or 200-level). SS/H courses = 200-level or higher (100- or 200-level).

Free: The only courses of the 34 that may be taken Satisfactory/Unsatisfactory (S/U) are free electives. Minimal limitations apply, see Handbook.

Matriculation: F11, F12, F13

Name:_____

Pratt's General Education Courses (w/ some EnvE restrictions)	**Semester**	**Grade**	**Notes**
1. WRITING 101 (20) ……			
2. MATH 111L (31L) or 21 (31) ……			
3. MATH 112L (32L) or 22 (32) or 122L (41L) ……			
4. MATH 212 (103) ……			
5. MATH 216 (107) ……			
6. MATH 353 (108) ……			
7. STA 130 (113) ……			
8. CHEM 101DL (31L) or 20 (18) or 21(19) ……			
9. PHYSICS 151L (61L) or 25 (61) ……			See **Physics**
10. PHYSICS 152L (62L) or 26 (62) ……			See **Physics**
11. BIOLOGY 201DL or approved biology course ……			See **Biology**
12. EGR 103L (53L) ……			E&AS: Digital systems
13. EGR 201L (75L) ……			E&AS: Mechanics-solids
14 EGR 305 (115) **or** CEE 201L……			E&AS: Systems analysis
15 CEE 160L (24L) or **upper-level** environmental ……			160L in year 1 or 2 only
16 ME 331L (101L) or approved thermo course ……			E&AS: Thermal/Transfer
Free Elective			
17. _____[1 / 0.5] _____[- / 0.5]			See **Free**
SS/H Electives ____ AoK ____ Depth			
18. _____ SS ALP CZ FL ○			See **SS/H**
19. _____ SS ALP CZ FL ○			See **SS/H**
20. _____ SS ALP CZ FL ○			See **SS/H**
21. _____ SS ALP CZ FL ○			See **SS/H**
22. _____ SS ALP CZ FL ○			See **SS/H**
EnvE Major Courses			
22.5 EGR 206 (150) [0.5] ……			
23.5 EGR 244L (123L) ……			
24. CEE 205 (100) [0.5] ……			
25. CEE 301L (122L) ……			
26. CEE 302L (139L) ……			See **Soils**
27. CEE 461L (120L) ……			
28. CEE 462L (124L) ……			
29. CEE 463L (123L) ……			
30. CEE 469 (193) ……			
31. CEE 560 (208) ……			
32. Environ Sci Elective _____ ……			See **EnvSci**
33. Transport Elective _____ ……			See **Transport**
34. Unit Operation and Design Elective _____			See **UO&D**

GENERAL NOTES: (1) This check sheet is terse; see Handbook for all details. (2) All courses are [1] unit, unless noted otherwise; (3) All courses must be successfully completed; no more than 2 courses with grade of D-, D, or D+.

Physics: At least 1 physics course must be taken at Duke. If AP credit for both 25 (61) & 26 (62), then one of 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for 26 (62) can be waived by taking 152L (62L). Cannot take 151 (61) and use AP for 26 (62)--unless the only physics AP credit you have is for 26 (62).

Biology: This is the NS elective for EnvE majors. May be replaced with an approved biology course.

Soils: May be replaced with an approved soil physics or earth science course.

EnvSci: CHEM 201DL (151L), CEE 563 (240), 566 (250), 661L (239L), 666 (235), ENVIRON 543A, 382LA, 383LA, or 573A.

Transport: BME 307, CEE 569 (229), 581 (245), 683 (227), 684 (224), EOS 272A, 315, 323, 273LA, ENVIRON 370A, 535, or 585A

UO&D: CEE 315 (185), 571 (249), 575 (247), 671 (243), 672 (248), 685 (246), or EGR 424L (190L).

SS/H: 5 courses from approved departments or programs (see Handbook); limit of 2 APs. 1 SS; 2 of the 3 areas: ALP, CZ, FL; 2 from the same department or program where 1 (cannot be AP) is upper-level. Only 1 AoK code can be applied per course.

Upper-level: Engineering courses = 300-level or higher (100- or 200-level). SS/H courses = 200-level or higher (100- or 200-level).

Free: The only courses of the 34 that may be taken Satisfactory/Unsatisfactory (S/U) are free electives. Minimal limitations apply, see Handbook.

Matriculation: F14

The degree check sheets on the following pages are applicable to students who matriculated in fall 2014.

As a suggestion in how one might complete the SS/H elective section of the check sheet please consider the following example. This is *not* a proposed plan of courses but rather an illustration of crossing out AoK codes that do not apply for courses taken and circling the codes that will be applied in order to satisfy the SS/H requirements in regards to having an SS course and completing two of the three areas: ALP, CZ, and FL. The depth requirement is indicated by filling the circles corresponding to the two courses from the same approved department or program where at least of the two is at the upper-level (200-level, or higher). This student, who graduated in spring 2014, was not required to take an EI course, but in this case they did. CE and EnvE students matriculating in fall 2014, or later, are required to possess an EI code among the 34 units required for the degree. This student studied abroad in the fall 2012, which is the reason for the two transfer (TR) grades.

SS/H Electives		____ AoK ____	Depth				
15.	POLSCI 90B_____	SS ~~ALP CZ FL~~	●	~~EI~~	2010 Fall	AP	See **SS/H, EI**
16.	MUSIC 161-1_____	~~SS~~ (ALP) ~~CZ FL~~	○	~~EI~~	2011 Spring		See **SS/H, EI**
17.	CULANTH 207_____	SS ~~ALP~~ (CZ) ~~FL~~	○	~~EI~~	2012 Fall	TR	See **SS/H, EI**
18.	MMS 220_____	SS ~~ALP CZ FL~~	○	~~EI~~	2012 Fall	TR	See **SS/H, EI**
19.	POLSCI 344_____	(SS) ~~ALP CZ FL~~	●	(EI)	2013 Spring		See **SS/H, EI**

Matriculation: F14

Name:_____

	Pratt's General Education Courses (w/ some CE restrictions)	**Semester**	**Grade**	**Notes**
1.	WRITING 101 (20) ……			
2.	MATH 111L (31L) or 21 (31) ……			
3.	MATH 112L (32L) or 22 (32) or 122L (41L) ……			
4.	MATH 212 (103) ……			
5.	MATH 216 (107) ……			
6.	MATH 353 (108) ……			
7.	STA 130 (113) ……			
8.	CHEM 101DL (31L) or 20 (18) or 21(19) ……			
9.	PHYSICS 151L (61L) or 25 (61) ……			See **Physics**
10.	PHYSICS 152L (62L) or 26 (62) ……			See **Physics**
11.	EGR 103L (53L) ……			E&AS: Digital sustems
12.	EGR 120L (25L) or **upper-level** structural ……			120L in year 1 or 2 only
13.	EGR 201L (75L) ……			E&AS: Mechanics-solids
14	EGR 305 (115) ……			E&AS: Systems analysis
15	CEE 160L (24L) or **upper-level** environmental ……			160L in year 1 or 2 only
	Science and Free Electives			
16.	NS Elective _____ ……			See **NS**
17.	E&AS Elective _____ ……MoI			See **E&AS**
18.	_____[1/0.5] _____[-/0.5] EI			See **Free, EI**
19.	_____[1/0.5] _____[-/0.5] EI			See **Free, EI**
	SS/H Electives ____ AoK ____ Depth			
20.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
21.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
22.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
23.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
24.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
	CE Major Courses			
24.5	EGR 206 (150) [0.5] ……			
25.5	EGR 244L (123L) ……			
26.5	CEE 201L (130L) ……			
27.	CEE 205 (100) [0.5] ……			
28.	CEE 301L (122L) ……			
29.	CEE 302L (139L) ……			
30.	CEE 421L (131L) ……			
31.	CEE 422L (133L) ……			
32.	CEE 423L (134L) ……			
33.	CEE 429 (192) ……			
34.	CEE Elective _____ ……			**Upper-level** CEE course

GENERAL NOTES: (1) This check sheet is terse; see Handbook for all details. (2) All courses are [1] unit, unless noted otherwise; (3) Highlighted items are unique to the S/M track. (4) All courses must be successfully completed; no more than 2 courses with grade of D-, D, or D+.

Physics: At least 1 physics course must be taken at Duke. If AP credit for both 25 (61) & 26 (62), then one of 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for 26 (62) can be waived by taking 152L (62L). Cannot take 151 (61) and use AP for 26 (62)--unless the only physics AP credit you have is for 26 (62).

NS: BIOLOGY 20 (19), 201L (101L), 215 (105), 275A (144), 311 (147), EOS 101 (11), 102 (12), 201L (101L), 202 (102), or 370A.

E&AS: BME 253L (153L), CEE 307 (207), 461L (120L), 462L (124L), 463L (123L)., 560 (208), 581 (245), COMPSCI 201 (100E), ECE 110L (27L), 311 (176), EGR 224L (119L), ME 221L (83L), 331L (101L), or PHYSICS 271L (171L).

SS/H: 5 courses from approved departments or programs (see Handbook); limit of 2 APs. 1 SS; 2 of the 3 areas: ALP, CZ, FL; 2 from the same department or program where 1 (cannot be AP) is upper-level. Only 1 AoK code can be applied per course.

Upper-level: Engineering courses = 300-level or higher (100- or 200-level). SS/H courses = 200-level or higher (100- or 200-level).

Free: The only courses of the 34 that may be taken Satisfactory/Unsatisfactory (S/U) are free electives. Minimal limitations apply, see Handbook.

EI: 1 of the 34 courses must have an ethical inquiry (EI) code. EI is a Mode of Inquiry (MoI).

Matriculation: F14

Name:_____

	Pratt's General Education Courses (w/ some CE restrictions)	Semester	Grade	Notes
1.	WRITING 101 (20) ……			
2.	MATH 111L (31L) or 21 (31) ……			
3.	MATH 112L (32L) or 22 (32) or 122L (41L) ……			
4.	MATH 212 (103) ……			
5.	MATH 216 (107) ……			
6.	MATH 353 (108) ……			
7.	STA 130 (113) ……			
8.	CHEM 101DL (31L) or 20 (18) or 21(19) ……			
9.	PHYSICS 151L (61L) or 25 (61) ……			See **Physics**
10.	PHYSICS 152L (62L) or 26 (62) ……			See **Physics**
11.	EGR 103L (53L) ……			E&AS: Digital systems
12.	EGR 120L (25L) or **upper-level** structural ……			120L in year 1 or 2 only
13.	EGR 201L (75L) ……			E&AS: Mechanics-solids
14	EGR 305 (115) ……			E&AS: Systems analysis
15	CEE 160L (24L) or **upper-level** environmental ……			160L in year 1 or 2 only
	Science and Free Electives			
16.	NS Elective _____ ……			See **NS**
17.	E&AS Elective _____ ……MoI			See **E&AS**
18.	_____[1/0.5] _____[-/0.5] EI			See **Free, EI**
19.	_____[1/0.5] _____[-/0.5] EI			See **Free, EI**
	SS/H Electives ____ AoK ____ Depth			
20.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
21.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
22.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
23.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
24.	_____ SS ALP CZ FL ○ EI			See **SS/H, EI**
	CE Major Courses			
24.5	EGR 206 (150) [0.5] ……			
25.5	EGR 244L (123L) ……			
26.5	CEE 201L (130L) ……			
27.	CEE 205 (100) [0.5] ……			
28.	CEE 301L (122L) ……			
29.	CEE 302L (139L) ……			
30.	CEE 461L (120L) ……			
31.	CEE 462L (124L) ……			
32.	CEE 463L (123L) ……			
33.	CEE 469 (193) ……			
34.	CEE Elective _____ ……			**Upper-level** CEE course

GENERAL NOTES: (1) This check sheet is terse; see Handbook for all details. (2) All courses are [1] unit, unless noted otherwise; (3) Highlighted items are unique to the E/W track. (4) All courses must be successfully completed; no more than 2 courses with grade of D-, D, or D+.

Physics: At least 1 physics course must be taken at Duke. If AP credit for both 25 (61) & 26 (62), then one of 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for 26 (62) can be waived by taking 152L (62L). Cannot take 151 (61) and use AP for 26 (62)--unless the only physics AP credit you have is for 26 (62).

NS: BIOLOGY 20 (19), 201L (101L), 215 (105), 275A (144), 311 (147), EOS 101 (11), 102 (12), 201L (101L), 202 (102), or 370A.

E&AS: BME 253L (153L), CEE 307 (207), 421L (131L), 422L (133L), 423L (134L)., 560 (208), 581 (245), COMPSCI 201 (100E), ECE 110L (27L), 311 (176), EGR 224L (119L), ME 221L (83L), 331L (101L), or PHYSICS 271L (171L).

SS/H: 5 courses from approved departments or programs (see Handbook); limit of 2 APs. 1 SS; 2 of the 3 areas: ALP, CZ, FL; 2 from the same department or program where 1 (cannot be AP) is upper-level. Only 1 AoK code can be applied per course.

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Matriculation: F14

Name:_____

	Pratt's General Education Courses (w/ some EnvE restrictions)	**Semester**	**Grade**	**Notes**
1.	WRITING 101 (20) ……			
2.	MATH 111L (31L) or 21 (31) ……			
3.	MATH 112L (32L) or 22 (32) or 122L (41L) ……			
4.	MATH 212 (103) ……			
5.	MATH 216 (107) ……			
6.	MATH 353 (108) ……			
7.	STA 130 (113) ……			
8.	CHEM 101DL (31L) or 20 (18) or 21(19) ……			
9.	PHYSICS 151L (61L) or 25 (61) ……			See **Physics**
10.	PHYSICS 152L (62L) or 26 (62) ……			See **Physics**
11.	BIOLOGY 201DL……			See **Biology**
12.	EGR 103L (53L) ……			E&AS: Digital systems
13.	EGR 201L (75L) ……			E&AS: Mechanics-solids
14	EGR 305 (115) **or** CEE 201L……			E&AS: Systems analysis
15	ME 331L (101L) or approved thermo course ……			E&AS: Therma/Transfer
16	CEE 160L (24L) or **upper-level** environmental ……			160L in year 1 or 2 only
	Free Elective			MoI
17.	_____[1/0.5] _____[-/0.5]			EI See **Free, EI**
	SS/H Electives ____ AoK ____ Depth			
18.	_____ SS ALP CZ FL ○			EI See **SS/H, EI**
19.	_____ SS ALP CZ FL ○			EI See **SS/H, EI**
20.	_____ SS ALP CZ FL ○			EI See **SS/H, EI**
21.	_____ SS ALP CZ FL ○			EI See **SS/H, EI**
22.	_____ SS ALP CZ FL ○			EI See **SS/H, EI**
	EnvE Major Courses			
22.5	EGR 206 (150) [0.5] ……			
23.5	EGR 244L (123L) ……			
24.	CEE 205 (100) [0.5] ……			
25.	CEE 301L (122L) ……			
26.	CEE 302L (139L) ……			See **Soils**
27.	CEE 461L (120L) ……			
28.	CEE 462L (124L) ……			
29.	CEE 463L (123L) ……			
30.	CEE 469 (193) ……			
31.	CEE 560 (208) ……			
32.	Environ Sci Elective _____ ……			See **EnvSci**
33.	Transport Elective _____ ……			See **Transport**
34.	Unit Operation and Design Elective _____			See **UO&D**

GENERAL NOTES: (1) This check sheet is terse; see Handbook for all details. (2) All courses are [1] unit, unless noted otherwise; (3) All courses must be successfully completed; no more than 2 courses with grade of D-, D, or D+.

Physics: At least 1 physics course must be taken at Duke. If AP credit for both 25 (61) & 26 (62), then one of 153L (63L), 264 (143), 361 (181), 362 (182), or 363 (176)) must be taken at Duke. Alternatively, AP credit for 26 (62) can be waived by taking 152L (62L). Cannot take 151 (61) and use AP for 26 (62)--unless the only physics AP credit you have is for 26 (62).

Biology: This is the NS elective for EnvE majors. May be replaced with an approved biology course.

Soils: May be replaced with an approved soil physics or earth science course.

EnvSci: CHEM 201DL (151L), CEE 563 (240), 566 (250), 661L (239L), 666 (235), ENVIRON 543A, 382LA, 383LA, or 573A.

Transport: BME 307, CEE 569 (229), 581 (245), 683 (227), 684 (224), EOS 272A, 315, 323, 273LA, ENVIRON 370A, 535, or 585A

UO&D: CEE 315 (185), 571 (249), 575 (247), 671 (243), 672 (248), 685 (246), or EGR 424L (190L).

SS/H: 5 courses from approved departments or programs (see Handbook); limit of 2 APs. 1 SS; 2 of the 3 areas: ALP, CZ, FL; 2 from the same department or program where 1 (cannot be AP) is upper-level. Only 1 AoK code can be applied per course.

Upper-level: Engineering courses = 300-level or higher (100- or 200-level). SS/H courses = 200-level or higher (100- or 200-level).

Free: The only courses of the 34 that may be taken Satisfactory/Unsatisfactory (S/U) are free electives. Minimal limitations apply, see Handbook.

EI: 1 of the 34 courses must have an ethical inquiry (EI) code. EI is a Mode of Inquiry (MoI).

Appendix C: Sample Schedules

A sample schedule is a semester-by-semester plan of courses that meet the program requirements while being consistent with the prerequisite structure of the program courses and not exceeding five courses in a semester. Sample schedules are typically presented below in tabular format.

Also presented below are pre-requisite flowcharts. A prerequisite flowchart is a graphical illustration of a sample schedule while also depicting the prerequisite structure among the courses. The pre-requisite and co-requisite structure of the courses are illustrated by solid and dotted arrows, respectively. A course is depicted by a box. The perimeter of the box is a solid or dashed line. A bold, colored, solid outline indicates that the course is generally only offered once a year; A solid orange line indicates a fall only course and a solid green outline indicates a spring only course. A bold dashed gray line indicates that the course is generally offered during both the fall and spring semesters. A narrow, light-gray outline is used for elective courses because when those courses are offered varies depending on the selected elective.

This Appendix is organized by matriculation date and then by program.

Matriculation: F11, F12, F13, F14

Below are sample schedules for students who matriculated in fall 2011, fall 2012, fall 2013, and fall 2014.

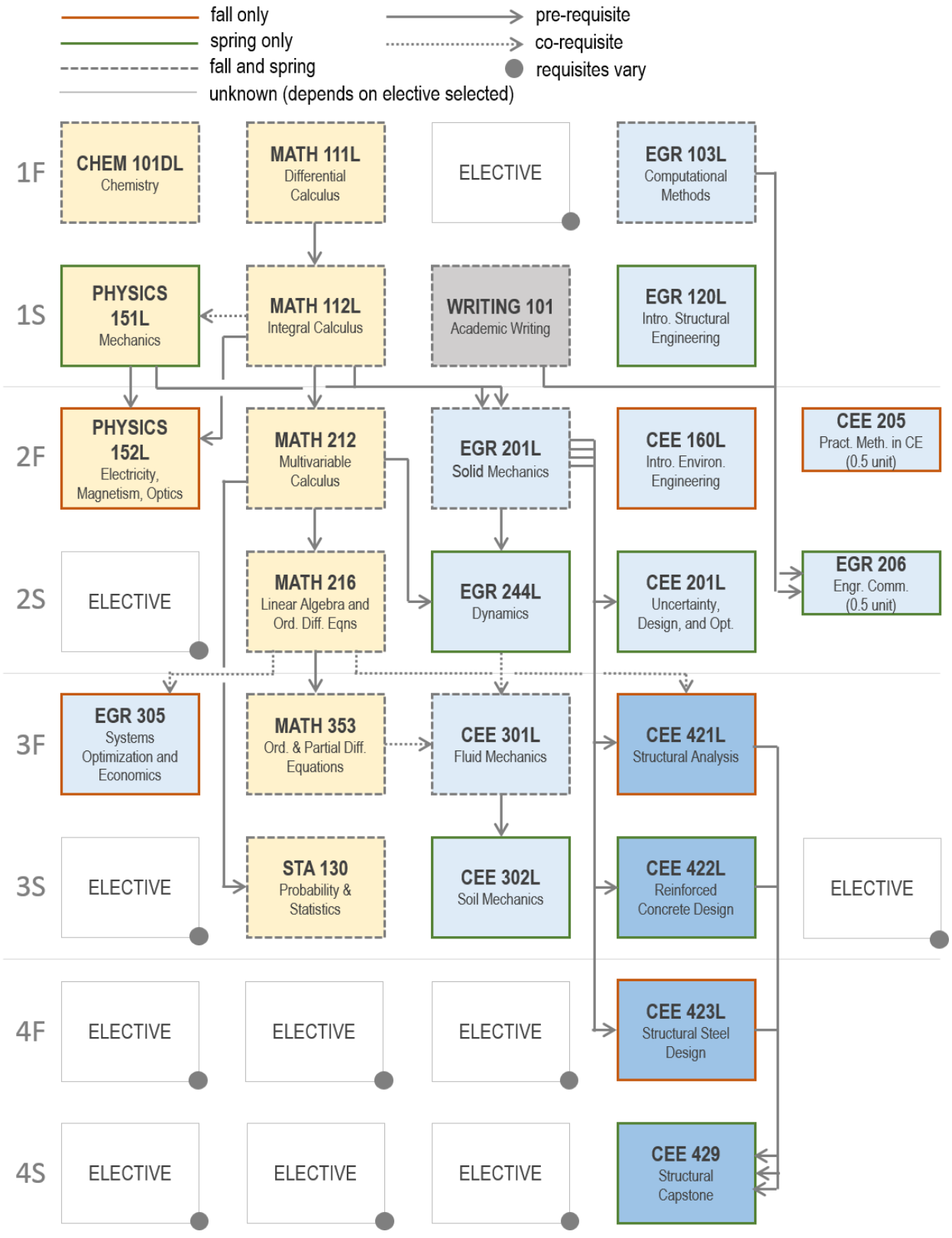
CE-S/M

The following sample schedules are provided:

- CE-S/M (Prerequisite Flowchart)
- CE-S/M
- CE-S/M + AE Certificate
- CE-S/M + ENRENV Certificate

CE-S/M (Prerequisite Flowchart)

Matriculation: F11, F12, F13, F14



CE-S/M

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	**EGR 120L (25L)** Intro Structural Engineering
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	**CEE 201L (130)** Uncertainty, Design & Optimization
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 422L (133L)** Reinforced Concrete Design
CEE 421L (131L) Structural Analysis	STA 130 (113) Probability & Statistics
EGR 305 (115) Systems Optimization & Economics	Elective
	Elective
Senior Year	
CEE 423L (134L) Structural Steel Design	**CEE 429(192)** Integrated Structural Design
Elective	Elective
Elective	Elective
Elective	Elective

NOTES

(1) Schedule, consisting of 34 units, assumes no AP credit

(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.

(3) Electives are (a) 5 SS/H, (b) 1 NS, (c) 1 E&AS, (d) 1 Upper-level CEE, and (e) 2 Free.

CE-S/M + AE Certificate

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	Elective
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	**CEE 201L (130)** Uncertainty, Design & Optimization
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 422L (133L)** Reinforced Concrete Design
CEE 421L (131L) Structural Analysis	STA 130 (113) Probability & Statistics
EGR 305 (115) Systems Optimization & Economics	Elective
ARTHIST 285/285D/286D Modern Arch. (CZ,ALP)	
Senior Year	
CEE 423L (134L) Structural Steel Design	**CEE 429(192)** Integrated Structural Design
CEE 311 (161) Architectural Engineering I	**CEE 411 (162)** Architectural Engineering II
Elective	Elective
Elective	Elective

NOTES

(1) Schedule, consisting of 34 units, assumes no AP credit

(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.

(3) Electives are (a) 4 SS/H, (b) 1 NS, (c) 1 E&AS, (d), and (e) 2 Free.

(4) Replaced EGR 120L with CEE 311; CEE 411 is upper-level CEE elective; ARTHIST 285/285D/286D counts as a SS/H course and possesses ALP and CZ codes.

(5) Double counted courses: Not applicable.

CE-S/M + ENRENV Certificate

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	**EGR 120L (25L)** Intro Structural Engineering
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	**CEE 201L (130)** Uncertainty, Design & Optimization
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 422L (133L)** Reinforced Concrete Design
CEE 421L (131L) Structural Analysis	STA 130 (113) Probability & Statistics
EGR 305 (115) Systems Optimization & Economics	ME 331L Thermodynamics
ENVIRON 330 Energy and the Environment	Elective
Senior Year	
CEE 423L (134L) Structural Steel Design	**CEE 429(192)** Integrated Structural Design
ME 461 Energy Engr and the Environment	**EGR 424L** Energy & Environment Design
Elective	Elective
Elective	Elective

NOTES

(1) Schedule, consisting of 35 units, assumes no AP credit
(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.
(3) Electives are (a) 5 SS/H (see notes 4 & 5, below), (b) 1 NS, (c) 1 Upper-level CEE (see note 5, below)
(4) ENRENV: Utilize 1 SS/H elective to satisfy the "Markets and Policy" elective; Most likely an SS course.
(5) ENRENV: Need the "additional elective course" for ENRENV. Options include (a) use an additional SS/H course for a second "Markets and Policy" course, (b) take CEE 315 which satisfies the upper-level CEE elective for CE, or (c) utilize an additional (36th) course.
(6) ENRENV: Environment elective = CEE 160L; Energy Science and Technology elective = ME 461L.
(7) CE: E&AS elective = ME 331L
(8) Double counted courses: None.

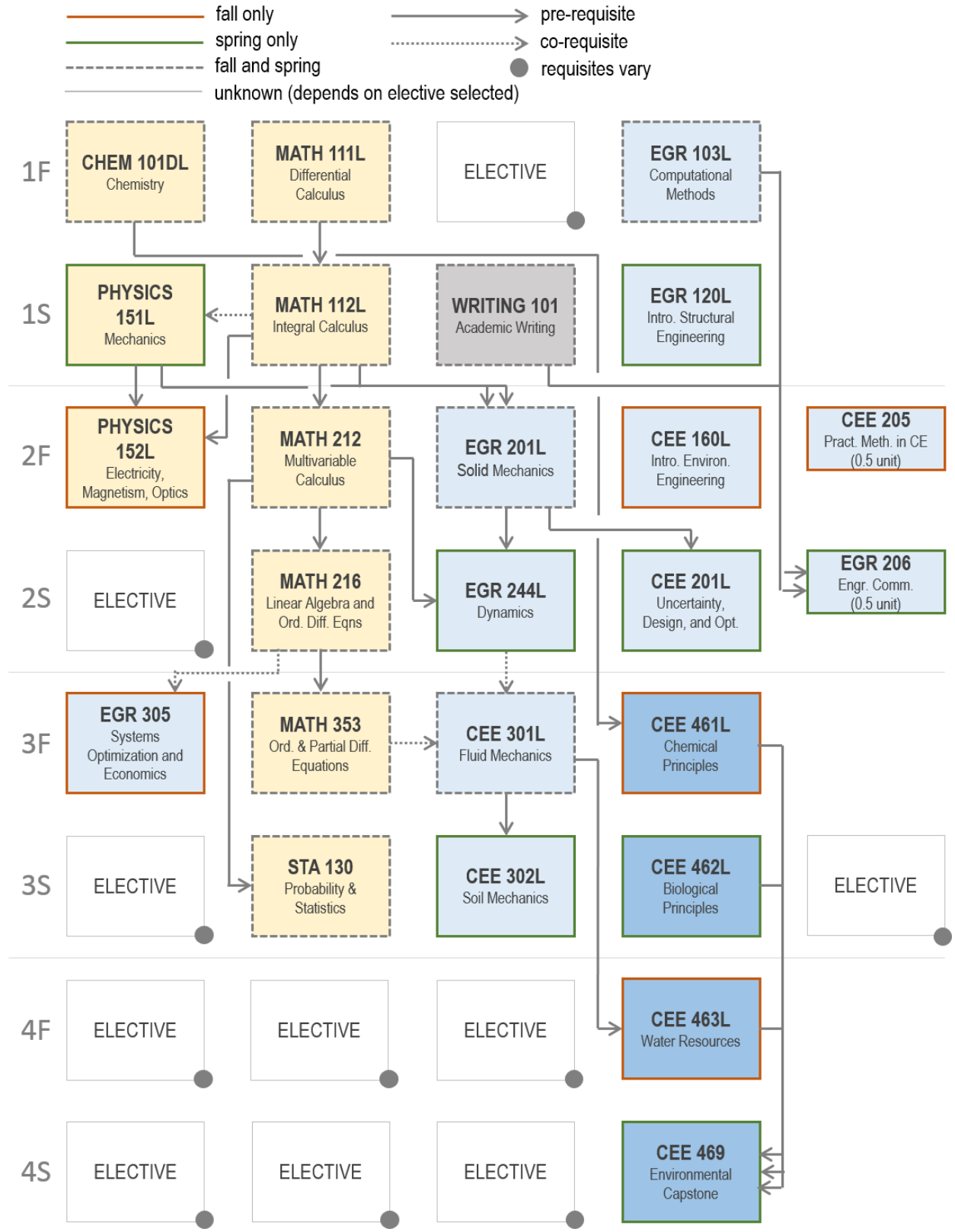
CE-E/W

The following sample schedules are provided:

- CE-E/W (Prerequisite Flowchart)
- CE-E/W
- CE-E/W + BME Major
- CE-E/W + ENRENV Certificate

CE-E/W (Prerequisite Flowchart)

Matriculation: F11, F12, F13, F14



CE-E/W

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	**EGR 120L (25L)** Intro Structural Engineering
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	**CEE 201L (130)** Uncertainty, Design & Optimization
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 462L (124L)** Biological Principles
CEE 461L (120L) Chemical Principles	STA 130 (113) Probability & Statistics
EGR 305 (115) Systems Optimization & Economics	Elective
	Elective
Senior Year	
CEE 463L (123L) Water Resources	**CEE 469 (193)** Integrated Environmental Design
Elective	Elective
Elective	Elective
Elective	Elective

NOTES
(1) Schedule, consisting of 34 units, assumes no AP credit
(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.
(3) Electives are (a) 5 SS/H, (b) 1 NS, (c) 1 E&AS, (d) 1 Upper-level CEE, and (e) 2 Free.

CE-E/W + BME Major

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	BIOLOGY 201L (101L) Molecular Biology
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	ECE 110L (27L) Fund. of Elect. & Comp. Engr.
BME 244L (144L) Quantitative Physiology	ME 221L (83L) Structure & Properties of Solids
CHEM 201DL (151L) Organic Chemistry, or CHEM 210DL (32L) Chemical Principles	Elective
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	STA 130 (113) Probability & Statistics
CEE 301L (122L) Fluid Mechanics	**CEE 462L (124L)** Biological Principles
CEE 461L (120L) Chemical Principles	**CEE 201L (130L)** Uncert., Design, and Optimization
BME 271 (171) Signals & Systems, or ECE 280L (54L) Signals & Systems	BME 302L (202L) Biomaterials & Biomechanics, or BME 307 (207) Transport Phenomena in Bio Systems
BME 260L (100L) Cellular and Molecular Systems	BME 354L (154L) Medical Instrumentation
Senior Year	
CEE 463L (123L) Water Resources	**CEE 469 (193)** Integrated Environmental Design
EGR 305 (115) Systems Optimization & Economics	Elective
Elective	Elective
Elective	Elective
Elective	

NOTES

(1) Schedule, consisting of 37 units, assumes no AP credit

(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.

(3) Electives are (a) 5 SS/H, (b) 1 CEE elective (see note 4), (c) 1 BME area elective (see note 5), and (d) 1 Life Science elective (see BME Handbook).

(4) CEE elective = CEE 561 (242), 562 (244), 563 (240), 564 (241), 571 (249), 575 (247), 581 (245), 661L (239L), 671 (243), 672 (248), or 685 (246).

(5) If BME 302L (202L) is taken then the BME area elective must come from the biomaterials/biomechanics area. If BME 307 (207) is taken then the BME area elective must come from the Molecular, Cellular, and Tissue Engineering area. See the BME Handbook for area elective options.

CE-E/W + ENRENV Certificate

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	**EGR 120L (25L)** Intro Structural Engineering
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	**CEE 201L (130)** Uncertainty, Design & Optimization
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 462L (124L)** Biological Principles
CEE 461L (120L) Chemical Principles	STA 130 (113) Probability & Statistics
EGR 305 (115) Systems Optimization & Economics	ME 331L Thermodynamics
ENVIRON 330 Energy and the Environment	Elective
Senior Year	
CEE 463L (123L) Water Resources	**CEE 469 (193)** Integrated Environmental Design
ME 461 Energy Engr and the Environment	**EGR 424L** Energy & Environment Design
Elective	Elective
Elective	Elective

NOTES

(1) Schedule, consisting of 35 units, assumes no AP credit
(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.
(3) Electives are (a) 5 SS/H (see note 4, below), (b) 1 NS, (c) 1 Upper-level CEE
(4) ENRENV: Utilize a SS/H elective to satisfy the "Markets and Policy" elective; Most likely an SS course.
(5) ENRENV: Environment elective = CEE 160L; Energy Science and Technology elective = ME 461L; Additional elective course = CEE 461L.
(6) CE: E&AS elective = ME 331L
(7) Double counted courses: CEE 461L.

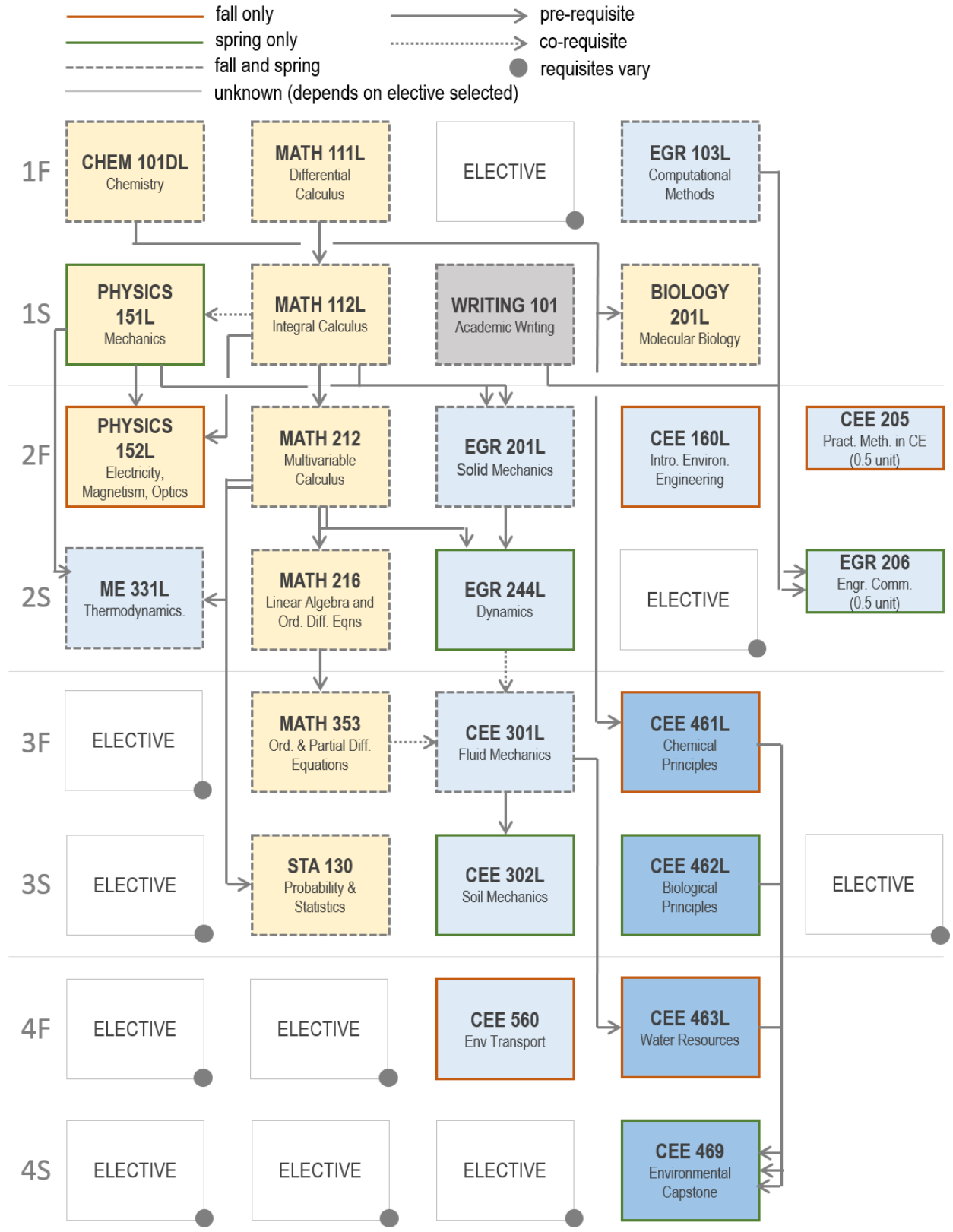
EnvE

The following sample schedules are provided:

- EnvE (Prerequisite Flowchart)
- EnvE
- EnvE + ENRENV Certificate

EnvE (Prerequisite Flowchart)

Matriculation: F11, F12, F13, F14



EnvE

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	BIOLOGY 201L Molecular Biology
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	ME 331L (101L) Thermodynamics
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 462L (124L)** Biological Principles
CEE 461L (120L) Chemical Principles	STA 130 (113) Probability & Statistics
Elective	Elective
	Elective
Senior Year	
CEE 463L (123L) Water Resources	**CEE 469 (193)** Integrated Environmental Design
CEE 560 (208) Environmental Transport Phenomena	Elective
Elective	Elective
Elective	Elective

NOTES

(1) Schedule, consisting of 34 units, assumes no AP credit

(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.

(3) Electives are (a) 5 SS/H, (b) EGR 305 or CEE 201L (c) 1 Environmental Science, (d) 1 Transport, (e) 1 Unit Operation and Design, and (f) 1 Free.

EnvE + ENRENV Certificate

Matriculation: F11, F12, F13, F14

Fall Semester	Spring Semester
First Year	
MATH 111L (31L) Differential Calculus	MATH 112L (32L) Integral Calculus
EGR 103L (53L) Computational Methods (MATLAB)	**PHYSICS 151L (61L)** Mechanics
CHEM 101DL (31L) Core Concepts in Chemistry	BIOLOGY 201L Molecular Biology
Elective / WRITING 101 (20)	WRITING 101 (20) / Elective
Sophomore Year	
MATH 212 (103) Multivariable Calculus	MATH 216 (107) Linear Algebra and Differential Eqns
PHYSICS 152L (62L) Electricity, Magnetism, & Optics	**EGR 244L (123L)** Dynamics
EGR 201L (75L) Mechanics of Solids	ME 331L (101L) Thermodynamics
CEE 160L (24L) Intro Environmental Engineering	Elective
CEE 205 (100) CE Applied Skills [0.5 unit]	**EGR 206 (150)** Engineering Communication [0.5 unit]
Junior Year	
MATH 353 (108) Ordinary and Partial Differential Eqns	**CEE 302L (139L)** Soil Mechanics
CEE 301L (122L) Fluid Mechanics	**CEE 462L (124L)** Biological Principles
CEE 461L (120L) Chemical Principles	STA 130 (113) Probability & Statistics
ENVIRON 330 Energy and the Environment	Elective
Elective	Elective
Senior Year	
CEE 463L (123L) Water Resources	**CEE 469 (193)** Integrated Environmental Design
CEE 560 (208) Environmental Transport Phenomena	**EGR 424L** Energy & Environment Design
ME 461 Energy Engr and the Environment	Elective
Elective	Elective

NOTES

(1) Schedule, consisting of 35 units, assumes no AP credit
(2) Course subject codes and numbers in **bold font** are typically only offered once a year—during the semester indicated.
(3) Electives are (a) 5 SS/H (see note 4, below), (b) EGR 305 or CEE 201L (c) 1 Environmental Science, (d) 1 Transport
(4) ENRENV: Utilize a SS/H elective to satisfy the "Markets and Policy" elective; Most likely an SS course.
(5) ENRENV: Environment elective = CEE 160L; Energy Science and Technology elective = ME 461L; Additional elective course = CEE 461L.
(6) EnvE: Unit Operation and Design elective = EGR 424L
(7) Double counted courses: CEE 461L and EGR 424L.

Appendix D: Upper-Level Discipline Courses

These are typical courses that are utilized in these areas and for which the prerequisites are satisfied by program requirements.

Upper-Level Structural (S/M) Courses

CEE 311	Architectural Engineering I	fall
CEE 315-20	Engr. Sustainable Design and the Global Comm.: Structural Focus	spring
CEE 411	Architectural Engineering II	spring
CEE 421L	Matrix Structural Analysis	fall
CEE 422L	Concrete and Composite Structures	spring
CEE 423L	Metallic Structures	fall
CEE 520	Continuum Mechanics	occasionally
CEE 530	Introduction to the Finite Element Method	occasionally
CEE 541	Structural Dynamics	occasionally

Upper-Level Environmental (E/W) Courses

CEE 315-60	Engr. Sustainable Design and the Global Comm.: Environmental Focus	spring
CEE 461L	Chemical Principles in Environmental Engineering	fall
CEE 462L	Biological Principles in Environmental Engineering	spring
CEE 463L	Water Resources Engineering	fall
CEE 560	Environmental Transport Phenomena	fall
CEE 566	Environmental Microbiology	fall
CEE 571	Control of Hazardous and Toxic Waste	occasionally
CEE 575	Air Pollution Control Engineering	occasionally
CEE 661L	Environmental Molecular Biotechnology	spring

Appendix E: Helpful Links

Bulletin of Undergraduate Instruction
http://registrar.duke.edu/university-bulletins/undergraduate-instruction

Duke Community Standard in Practice
http://registrar.duke.edu/university-bulletins/duke-community-standard-practice-guide-undergraduates

Pratt Policies and Procedures
http://www.pratt.duke.edu/undergrad/policies

Pratt's Declaration of Major Form
http://www.pratt.duke.edu/forms/declaration-of-major

Registrar's Office
http://registrar.duke.edu/

Academic Calendars
http://registrar.duke.edu/academic-calendar

Duke's Interinstitutional Registration Agreement
http://registrar.duke.edu/special-registrations/interinstitutional-registration

Global Education Office
http://globaled.duke.edu/

Global Education's Course Approval Database
http://globaled.duke.edu/for_students/Academics/Course_Approval_Database

Career Center
http://studentaffairs.duke.edu/career

DukeReach
http://studentaffairs.duke.edu/dos/dukereach

CEE's Independent Study Approval Form
http://www.cee.duke.edu/sites/cee.duke.edu/files/IndStudyForm_CEE491-492.docx