SCHEME

OF

STUDIES AND

EXAMINATIONS

B.TECH. ELECTRICAL ENGINEERING
(w.e.f. 2012-13)

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 1ST YEAR (SEMESTER – I) (Common for all branches)
Credit Based Scheme w.e.f. 2012-13

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	HUM 101B	COMMUNICATIVE ENGLISH	3	1		25	75	-	100	4	3
2	MATH 101B	MATHEMATICS-I	3	1		25	75	-	100	4	3
3	PHY 101B	ENGINEERING PHYSICS-I	3	1		25	75	-	100	4	3
4	ME101B	MANUFACTURING PROCESSES **(Gr-A)**	3	1		25	75	-	100	4	3
	CH101 B	**OR** ENGINEERING CHEMISTRY **(Gr-B)**	3	1		25	75				
5	EE101B	PRINCIPLES OF ELECTRICAL ENGINEERING **(Gr-A)**	3	1		25	75	-	100	4	3
	CSE101B	**OR** INTRODUCTION TO COMPUTERS & PROGRAMMING **(Gr-B)**	3	1		25	75	-	100		
6	ME103B	ENGINEERING GRAPHICS & DRAWING **(Gr-A)**	1	-	4	40	-	60	100	3	3
	ME105B	OR ELEMENTS OF MECHANICAL ENGINEERING **(Gr-B)**	3	1	-	25	75		100	4	
7	PHY103B	PHYSICS LAB-I	-	-	2	20		30	50	1	3
8	ME 107B	WORKSHOP PRACTICE **(Gr-A)**	-	-	4	40		60	100	2	3
	CH103B	OR CHEMISTRY LAB **(Gr-B)**	-	-	2	20		30	50	1	
9	EE103B	PRINCIPLES OF ELECTRICAL ENGINEERING LAB **(Gr-A)**	-	-	2	20		30	50	1	3
	CSE103B	**OR** COMPUTER PROGRAMMING LAB **(Gr-B)**	-	-	2	20		30	50	1	
10	ME109B	ELEMENTS OF MECHANICAL ENGINEERING LAB **(Gr-B)**	-	-	2	20		30	50	1	3
Total		**Gr-A**	**16**	**5**	**12**	**245**	**375**	**180**	**800**	**27**	
		Gr-B	**18**	**6**	**8**	**230**	**450**	**120**	**800**	**28**	

Note:

1. Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Moral Values & Ethics and sports are given in General Proficiency Syllabus.
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
3. Electronics gadgets including Cellular phones are not allowed in the examination.
4. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/ college, so that there is an equitable distribution of teaching load in odd and even semesters.

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 1ST YEAR (SEMESTER – II) (Common for all branches)
Credit Based Scheme w.e.f. 2012-13

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1.	MATH102B	MATHEMATICS-II	3	1		25	75	-	100	4	3
2	PHY102B	ENGINEERING PHYSICS-II	3	1		25	75	-	100	4	3
3	ME101 B	MANUFACTURING PROCESSES (**Gr-B**)	3	1		25	75	-	100	4	3
		OR									
	CH101 B	ENGINEERING CHEMISTRY **(Gr-A)**	3	1		25	75				
4	EE101B	PRINCIPLES OF ELECTRICAL ENGINEERING (**Gr-B)**	3	1		25	75	-	100	4	3
		OR									
	CSE101B	INTRODUCTION TO COMPUTERS & PROGRAMMING **(Gr-A)**	3	1		25	75	-			
5	ECE102B	BASICS OF ELECTRONICS ENGINEERING **OR**	3	1		25	75	-	100	4	3
	BT102B	BASICS OF BIO TECHNOLOGY									
		OR									
	HUM102 B	ORAL COMMUNICATION SKILLS **OR**									
	CE102 B	BASICS OF CIVIL ENGINEERING									
6	ME103B	ENGINEERING GRAPHICS & DRAWING (**Gr-B)**	1	-	4	40	-	60	100	3	3
		OR									
	ME105B	ELEMENTS OF MECHANICAL ENGINEERING **(Gr-A)**	3	1	-	25	75	-	100	4	
7	PHY104B	PHYSICS LAB-II	-	-	2	20		30	50	1	3
8	ME 107B	WORKSHOP PRACTICE (**Gr-B)**	-	-	4	40		60	100	2	3
		OR									
	CH103B	CHEMISTRY LAB **(Gr-A)**	-	-	2	20		30	50	1	
9	EE103B	PRINCIPLES OF ELECTRICAL ENGINEERING LAB (**Gr-B)**	-	-	2	20		30	50	1	3
		OR									
	CSE103B	COMPUTER PROGRAMMING LAB **(Gr-A)**	-	-	2	20		30	50		
10	ME109B	ELEMENTS OF MECHANICAL ENGINEERING LAB **(Gr-A)**	-	-	2	20		30	50	1	3
11	GP 102B	GENERAL PROFICIENCY & ETHICS	1	-	-	-		50	50	2	
Total		**Gr-B**	**17**	**5**	**12**	**245**	**375**	**230**	**850**	**29**	
		Gr-A	**19**	**6**	**8**	**230**	**450**	**170**	**850**	**30**	

Note:

1. Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Moral Values & Ethics and Sports are given in General Proficiency Syllabus.
2. Each student has to undergo a workshop atleast 4 weeks (80-100 hours) at the end of II semester during summer vacations. **Out of the four weeks, two weeks would be dedicated**

to general skills and two weeks training for specialized discipline/ department The evaluation of this training shall be carried out in the III semester.

3. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
4. Electronics gadgets including Cellular phones are not allowed in the examination.
5. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/ college, so that there is an equitable distribution of teaching load in odd and even semesters.
6. The elective course HUM102 B ORAL COMMUNICATION SKILLS is deleted with effect from the session 2013 -14.

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL, SONEPAT

SCHEME OF STUDIES & EXAMINATIONS

B.TECH. 2nd YEAR (SEMESTER – III) ELECTRICAL ENGINEERING

Credit Based Scheme w.e.f. 2013–2014

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credits	Duration of Exam
			L	T	P		Theory	Prac.			
1.	EE209B	ESTIMATION COSTING & ELECTRIC CODES and STANDARDS	3	1	-	25	75	-	100	4	3
2.	MGT201B	ENGINEERING ECONOMICS **(Gr – A) (**common for all branches except BT & BME)	4	0	-	25	75	-	100	4	3
		OR									
	GES201B	ENVIRONMENTAL STUDIES **(Gr – B) (**common for all branches)	3	-	-	-	75*	-	75*	-	3
3.	EE201B	ELECTRICAL ENGINEERING MATERIALS (EE, EEE, IC,AEI)	3	-	-	25	75	-	100	3	3
4.	EE203B	NETWORK ANALYSIS-I (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
5.	ECE201B	DIGITAL ELECTRONICS (CSE,ECE, EEE, IC, EE)	3	1	-	25	75	-	100	4	3
6.	EE205B	NUMERICAL METHODS & OPTIMIZATION TECHNIQUES (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
7.	EE207B	POWER ELECTRONICS DEVICES (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
8.	ECE221B	DIGITAL ELECTRONICS LAB. (CSE,ECE, EEE, IC, EE)	-	-	2	20	-	30	50	1	3
9.	EE225B	NUMERICAL METHODS & OPTIMIZATION TECHNIQUES LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
10.	EE231B	ELECTRICAL WIRING & INSTALLATIONS LAB (EE, EEE, IC, CHE)	-	-	2	20	-	30	50	1	3
11.	GES203B	ENVIRONMENTAL STUDIES FIELD WORK **(Gr – B)(**Common to all branches)	-	-	-	-	-	25*	25*	-	3
12.	ME217B	WORKSHOP	-	-	2	50	-	-	50	2	
		Total Gr-B	21	05	08	260	525	115	900	28	
		Gr-A	22	05	08	285	525	90	900	32	

Note:

1. **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of moral values & ethics is given in General Proficiency Syllabus.**
2. ***The Environmental studies (GES201B) and Environmental Studies Field Work (GES203B) are compulsory & qualifying courses.**
3. **The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.**
4. **Electronics gadgets including Cellular phones are not allowed in the examination.**

5. **Assessment of workshop Training is undergone in summer vacations at the end of second semester will be based on seminar viva-voce, report & certificate of workshop training obtained by the students from in house workshop.**
6. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/ college, so that there is an equitable distribution of teaching load in odd and even semesters.

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL, SONEPAT
SCHEME OF STUDIES & EXAMINATIONS
B.TECH. 2nd YEAR (SEMESTER – IV) ELECTRICAL ENGINEERING
Credit Based Scheme w.e.f. 2013–2014

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credit	Duration of Exam
			L	T	P		Theory	Prac.			
1.	MGT201B	ENGINEERING ECONOMICS **(Gr – B) (**common for all branches except BT & BME) **OR**	4	0	-	25	75	-	100	4	3
	GES201B	ENVIRONMENTAL STUDIES **(Gr – A) (**common for all branches)	3	-	-	-	75*	-	75*	-	3
2.	EE202B	NETWORK ANALYSIS-II (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
3.	EE204B	ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
4.	EE206B	ELECTRICAL MACHINES-I	3	1	-	25	75	-	100	4	3
5.	EE208B	ELECTROMAGNETIC THEORY (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
6.	EE210B	CONTROL SYSTEMS ENGG. (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
7.	EE222B	NETWORK ANALYSIS LAB (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
8.	EE224B	ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
9.	EE226B	ELECTRICAL MACHINES-I LAB.	-	-	3	40	-	60	100	2	3
10.	EE230B	CONTROL SYSTEMS ENGG. LAB. (EE, EEE, IC,)	-	-	2	20	-	30	50	1	3
11.	GES203B	ENVIRONMENTAL STUDIES FIELD WORK **(Gr – A) (common for all branches)**	-	-	-	-	-	25*	25*	-	3
12.	GPEE202B	GENERAL PROFICIENCY & ETHICS	1	-	-	-	-	75	75	2	3
		Total Gr-B	19	05	9	250	450	200	900	31	
		Gr-A	18	05	9	225	450	225	900	27	

Note:

1. **Each student has to undergo Professional Training-I of at least 4 weeks from the industry / institute / research lab / training centre, etc. during summer vacation at the end of 4th Semester & its evaluation shall be carried out in 5th Semester.**
2. **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of moral values & ethics is given in General Proficiency Syllabus.**
3. ***The Environmental studies (GES201B) and Environmental Studies Field Work (GES203B) are compulsory & qualifying courses.**
4. **The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.**

5. **Electronics gadgets including Cellular phones are not allowed in the examination.**
6. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/ college, so that there is an equitable distribution of teaching load in odd and even semesters.

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL, SONEPAT
SCHEME OF STUDIES & EXAMINATIONS
B.TECH. 3rd YEAR (SEMESTER – V) ELECTRICAL ENGINEERING
Credit Based Scheme w.e.f. 2014–2015

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credits	Duration of Exam
			L	T	P		Theory	Prac.			
1.	EE301B	ELECTRICAL MACHINES-II	3	1	-	25	75	-	100	4	3
2.	EE303B	DIGITAL CONTROL SYSTEMS (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
3.	ECE311B	INTEGRATED ELECTRONICS (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
4.	EE305B	POWER SYSTEMS-I (EE,EEE)	3	1	-	25	75	-	100	4	3
5.	EE307B	POWER ELECTRONICS CIRCUITS (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
6.	EE309B	MICROPROCESSOR (8085), INTERFACING & APPLICATIONS (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
7.	EE321B	ELECTRICAL MACHINES-II LAB.	-	-	2	20	-	30	50	1	3
8.	ECE331B	INTEGRATED ELECTRONICS LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
9.	EE327B	POWER ELECTRONICS LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
10.	EE329B	MICROPROCESSOR (8085), INTERFACING & APPLICATIONS LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
11.	EE333B	PROFESSIONAL TRAINING-I	-	-	2	50	-	-	50	2	-
		TOTAL	18	06	10	280	450	120	850	30	

Note:

1. **Assessment of Professional Training-I, undergone in summer vacations at the end of 4th semester, will be based on seminar, viva-voce, report & certificate of professional training obtained by the students from the industry / institute / research lab / training center, etc.**
2. **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of moral values & ethics is given in General Proficiency Syllabus.**
3. **The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.**
4. **Electronics gadgets including Cellular phones are not allowed in the examination.**

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL, SONEPAT
SCHEME OF STUDIES & EXAMINATIONS
B.TECH. 3rd YEAR (SEMESTER – VI) ELECTRICAL ENGINEERING
Credit Based Scheme w.e.f. 2014–2015

S. no.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credits	Duration of Exam
			L	T	P		Theory	Prac.			
1.	EE302B	POWER SYSTEMS –II (EE,EEE)	3	1	-	25	75	-	100	4	3
2.	EE304B	CONVENTIONAL & CAD OF ELECTRICAL MACHINES	3	1	-	25	75	-	100	4	3
3.	EE306B	ADVANCED MICROPROCESSOR AND MICRO-CONTROLLER (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
4.	ECE312B	COMMUNICATION SYSTEMS & TECHNOLOGY(EE, EEE, IC)	3	1	-	25	75	-	100	4	3
5.	EE308B	ELECTRIC POWER GENERATION (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
6.	EE310B	EMBEDDED SYSTEMS & APPLICATIONS (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
7.	EE322B	POWER SYSTEMS LAB (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
8.	EE324B	CONVENTIONAL & CAD OF ELECTRICAL MACHINES LAB	-	-	2	20	-	30	50	1	3
9.	EE326B	ADVANCED MICROPROCESSOR AND MICRO-CONTROLLER LAB (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
10.	ECE332B	COMMUNICATION SYSTEMS & TECHNOLOGY LAB (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
11.	HUM302B	REPORT WRITING SKILLS (common for all branches)	1	-	-	25	50	-	75	1	2
12	HUM304B	ORAL PRESENTATION SKILL(common for all branches)	-	-	2	20	-	30	50	1	2
13	GPEE302B	GENERAL PROFICIENCY & ETHICS	1	-	-	-	-	75	75	2	
		TOTAL	20	06	10	275	500	200	975	32	

Note:

1. **Each student has to undergo Professional Training-I of at least 4 weeks from the industry / institute / research lab / training centre, etc. during summer vacation at the end of 6th Semester & its evaluation shall be carried out in 7th Semester.**
2. **The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.**
3. **Electronics gadgets including Cellular phones are not allowed in the examination.**
4. **General Proficiency shall be evaluated at the end of the semester by a two-member committee constituted by Department chairman/Head of the institution.**

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL, SONEPAT

SCHEME OF STUDIES & EXAMINATIONS

B.TECH. 4th YEAR (SEMESTER – VII) ELECTRICAL ENGINEERING

Credit Based Scheme w.e.f. 2015-2016

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credits	Duration of Exam
			L	T	P		Theory	Prac.			
1.	EE401B	SENSORS & TRANSDUCERS (EE, EEE, IC, common with 5th sem. AEI)	3	1	-	25	75	-	100	4	3
2.	EE403B	ELECTRIC DRIVES (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
3.	EE405B	DIGITAL SIGNAL & IMAGE PROCESSING (EE, EEE, IC)	3	1	-	25	75	-	100	4	3
4.	EE407B	POWER SYSTEM OPERATION AND CONTROL	3	1	-	25	75	-	100	4	3
5.		Open ELECTIVE	4	-	-	25	75	-	100	4	3
6.	EE423B	ELECTRIC DRIVES LAB. (EE, EEE, IC)			2	20	-	30	50	1	3
7.	EE425B	DIGITAL SIGNAL & IMAGE PROCESSING LAB. (EE, EEE, IC)	-	-	2	20	-	30	50	1	3
8.	EE415B	PROJECT	-	-	4	100	-	-	100	4	-
9.	EE433B	PROFESSIONAL TRAINING – II	-	-	2	50	-	-	50	2	-
		TOTAL	16	04	10	295	375	60	730	28	

LIST OF OPEN ELECTIVES:

1	MEI 623B	ENTREPRENEURSHIP	6	BT401B	BIOINFORMATICS
2	BME451B	MEDICAL INSTRUMENTATION	7	AE417B	MODERN VEHICLE TECHNOLOGY
3	ECE305B	CONSUMER ELECTRONICS	8	CE451B	POLLUTION & CONTROL
4	EE451B	ENERGY AUDIT	9	CSE411B	MANAGEMENT INFORMATION SYSTEM
5	EEE457B	ENERGY RESOURCES & TECHNOLOGY	10	IT413B	CYBER SECURITY

Note:

1. **Assessment of Professional Training-II, undergone in summer vacations at the end of 6th semester, will be based on seminar, viva-voce, report & certificate of professional training obtained by the students from the industry / institute / research lab / training centre, etc.**
2. **Student will be permitted to opt for any one professional elective. However, departments will offer only those electives for which they have the requisite expertise. The choice of students for any elective shall not be binding on the department to offer, if department does not have the necessary expertise. Minimum strength of students shall be twenty.**
3. **Project load will be treated as 2 hrs. per week for project coordinator including his own guiding load of 1 hour, and 1 hour for each participating teacher irrespective of number of students/groups under him/her. Project will commence in VII Semester where student will identify project problem, complete design, procure the material, start the fabrication, complete the survey, etc. depending upon nature of the problem. Project will continue in VIII semester.**
4. **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of moral values & ethics is given in General Proficiency Syllabus.**
5. **The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.**
6. **Electronics gadgets including Cellular phones are not allowed in the examination.**

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL, SONEPAT
SCHEME OF STUDIES & EXAMINATIONS
B.TECH. 4th YEAR (SEMESTER – VIII) ELECTRICAL ENGINEERING
Credit Based Scheme w.e.f. 2015-2016

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total Marks	Total Credits	Duration of Exam
			L	T	P		Theory	Prac.			
1.	EE402B	ADVANCED CONTROL SYSTEMS (EE, IC)	3	1	-	25	75	-	100	4	3
2.	EE404B	COMPUTER APPLICATIONS TO POWER SYSTEM ANALYSIS (EE, EEE)	3	1	-	25	75	-	100	4	3
3.		DEPT. ELECTIVE – I	4	-	-	25	75	-	100	4	3
4.		DEPT. ELECTIVE – II	4	-	-	25	75	-	100	4	3
5.	EE414B	COMPUTER APPLICATIONS TO POWER SYSTEM ANALYSIS LAB. (EE, EEE)	-	-	2	20	-	30	50	1	3
6.	EE412B	SEMINAR	-	-	2	50	-	-	50	2	-
7.	EE415B	PROJECT	-	-	8	75	-	125	200	8	3
8.	GPEE402B	GENERAL FITNESS FOR THE PROFESSION	1	-	-	-	-	100	100	4	3
		TOTAL	15	02	12	250	300	250	800	31	

DEPT. ELECTIVE – I

1. EE432B EHV AC / DC
2. EE434B ADVANCED INSTRUMENTATION
3. EE424B FUZZY CONTROL SYSTEM
4. EE438B RECENT TRENDS IN DE-REGULATED POWER SYSTEMS
5. EE466B UTILIZATION OF ELECTRIC POWER & TRACTION

DEPT. ELECTIVE – II

1. EE442B HIGH VOLTAGE ENGINEERING
2. EE444B ELECTRICAL POWER QUALITY
3. EE446B ARTIFICIAL INTELLIGENCE
4. EE426B COMPUTER-BASED INSTRUMENTATION & CONTROL
5. EE450B POWER MANAGEMENT

Note:

1. **Project load will be treated as 2 hrs. per week for the project coordinator including his own guiding load of 1 hour, and 1 hour for each participating teacher irrespective of number of students / groups under him / her. Project involving design, fabrication, testing, computer simulation, case studies etc., which has been commenced by students in VII semester will be completed in VIII semester.**
2. **For the subject EE412B-Seminar, a student will select a topic from emerging areas of Engineering and Technology and study it independently. Student will give a seminar talk on the topic.**
3. **A team consisting of Dean of faculty or Director/Principal, Chairperson/Head of the department & an external examiner appointed by University shall carry out the evaluation of the student for his / her General Fitness for the Profession.**
4. **The students will be allowed to use non-programmable scientific calculator in the examination. However, sharing/exchange of calculator is prohibited in the examination.**
5. **Electronics gadgets including Cellular phones are not allowed in the examination.**
6. **Students will be permitted to opt for any one elective. However, departments will offer only those electives for which they have expertise. The choice of students for any elective shall not be a binding for department to offer, if department does not have expertise. Minimum strength of students shall be twenty.**

GP 102B GENERAL PROFICIENCY & ETHICS							
B. Tech. Semester – II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Examination**	**:**	**50Marks**
1	**--**	**--**	**2**		**Total**	**:**	**50 Marks**

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him / her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/ her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance --------

II. Extra Curricular Activities / Community Service, Hostel Activities **(8 Marks)**

III Technical Activities / Industrial, Educational tour **(8 Marks)**

IV Sports/games **(4 Marks)**

V Moral values & Ethics **(10 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/ her achievement and verbal & communicative skill through presentation before the committee.
(20 Marks)

C. Moral values & Ethics

Syllabus - Introduction to Value Education, Understanding ethics, value system, happiness, prosperity.

A minor test / Quiz will be conducted and It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1 Chairperson of the Department Chairman
2 Senior Most Faculty Counselor Member
3 Vice- Chancellor's Nominee Member

Affiliated Colleges:

1 Director/Principal Chairman
2 Head of the Department/Sr. Faculty Member
3 External Examiner to be appointed by the University Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

EE-209B ESTIMATION COSTING, ELECTRICAL CODES & STANDARDS
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-III

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Purpose of estimating and costing, per forma for making estimates, Preparation of materials schedule, costing, price list, preparation of tender document (with 2-3 exercises), net price list, market survey, overhead charges, labour charges, electric point method and fixed percentage method, contingency, profit, purchase system, enquiries, comparative statements, orders for supply, payment of bills. Tenders- its constituents, finalization, specimen tender.

UNIT-II

General and common aspects (National electrical code SP 30:2011), Scope of the national electrical code and definitions, Graphical symbols, guidelines for preparation of diagrams, charts, tables, and marking, Standard values, Fundamental principles of electrical installations, Assessment of General characteristics of Buildings**,** Wiring installations- terminology, & general aspects for selection of wiring systems, Mains intake and distribution of electrical energy in consumers premises – Distribution board system & distribution, distribution board system, general design of feeder, distribution & final circuit, special cabling requirement safety in electrical work, safety practices.

UNIT-III

Wiring systems-Size of wires, protection of wiring from damage, Cleated wiring system, Casing wiring, metal-sheathed wiring, C.T.S. wiring, PVC wiring, All insulated wiring, Enclosed wiring systems, Equipment, fitting and accessories, Ceiling roses, Luminaries, lamp holders, lamps, socket outlets and plugs, switches, fans, **Earthing**-General remarks, design considerations, earth electrodes and its types, measurement of earth electrode resistance, earthing of installations in buildings, types of system earthing.

UNIT-IV

Electrical aspects of building services-general guidelines, aspects of lightning services, aspects of ventilation, aspects of air conditioning and heating services, electrical aspects of lifts, escalator services, fire alarm and fighting system, clock systems, telephone systems, electrical aspects of computer control of environmental systems-Building management system(BMS) and its Architecture, Electrical installations in domestic & commercial buildings- classification, General characteristics of installations, supply characteristics and parameters, switchgear for control and protection, service lines, metering. earthing, building services, fire protection & testing in domestic & commercial buildings.

TEXT BOOKS:

1. Electrical Installation, estimating and costing: JB Gupta; SK Kataria and sons, New Delhi.
2. Estimating and costing :SK Bhattacharya ; TMH, New Delhi.
3. National Electrical code 2011: Bureau of Indian Standards

REFERENCE BOOKS:

1. Estimating and costing: Surjeet singh; Dhanpat Rai.and co., New Delhi.

2. Estimating and costing: SL Uppal, khanna publishers, New delhi.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all containing two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

MGT 201B ENGINEERING ECONOMICS

B.TECH. (ELECTRICAL ENGINEERING)

Semester – III/IV (Common for all Branches Except BT& BME)

L	T	P	Credits			
4	-	--	4			

Class Work		**:**	**25 Marks**
Examination		**:**	**75Marks**
Total		**:**	**100 Marks**
Duration of Examination		**:**	**3 Hours**

COURSE OBJECTIVE: The aims of this course are to:

1. Acquaint the student with the basic economic concepts and their operational significance
2. Stimulate him to think systematically and objectively about cotemporary economic problems.

UNIT-I

Definition of economics- various definitions, nature of Economic problem, Micro and macro economics- their feature and scope, production possibility curve, Economic laws and their nature. Relation between Science, Engineering Technology and Economics. Concept and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility – its practical application and importance**.**

UNIT-II

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve. Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & application of the concept of elasticity of demand. Various concepts of cost-Fixed cost, variable cost, average cost, marginal cost, money cost, real cost, opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT III

Meaning of production and factors of production; Law of variable proportions, Law of Return to Scale, Internet and External economics and diseconomies of scale. Meaning of Market, Type of Marker– perfect Competition, Monopoly, Oligopoly, Monopolistic competition (Main features of these markers).

UNIT-IV

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices . Nature and characteristics of Indian economy, privatization – meaning, merits and demerits. Globalisation of India economy – merits and demerits. Elementary Concept of WTO & TRIPS agreement, Monitory Policy & Fiscal Policy

TEXT BOOKS:

1. Ahuja H.L"Micro Ecomomic Theory" S. Chand Publication, New Delhi
2. Dewett K.K "Modern Ecomomic Theory" S. Chand Publication, New Delhi
3. Jain T.R, Grover M.L, Ohri V.K Khanna O.P,"Economics for engineers" V.K .Publication ,New Delhi

SUGGESTED BOOKS:

1. Jhingan M.L"Micro Ecomomic Theory" S.Chand Publication ,New Delhi
2. Chopra P.N "Principle of Economics" Kalyani Publishers, Delhi

3. Mishra S.K “Modern Micro Economics” Pragati Publication Mumbai.
4. Dwivedi D.N ”Micro Economics ” Pearson Education, New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed

GES 201B ENVIRONMENTAL STUDIES

B.TECH. (ELECTRICAL ENGINEERING)

Semester – III/IV (Common for all Branches)

L	T	P	Credits			
3	--	--	0	**Examination**	:	**75Marks**
				Total	:	**75 Marks**
				Duration of Examination	:	**3 Hours**

UNIT – I The Multidisciplinary nature of environmental studies, Definition, scope and importance.

Need for Public awareness

UNIT – II Natural Resources:

Renewable and non-renewable resources:

Natural resources and associated problems.

a) Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.
b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources; case studies.
f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
   - Role of an individual in conservation of natural resources.
   - Equitable use of resources for sustainable lifestyles.

UNIT- III Ecosystems:

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following eco-system:
  a) Forest ecosystem.
  b) Grassland ecosystem.
  c) Desert ecosystem.
  d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT- IV Biodiversity and its conservations:

- Introduction – Definition: Genetic, species and ecosystem diversity.
- Biogeographically classification of India.

- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation.
- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.

UNIT – V Environmental Pollution:

Definition, causes, effects and control, measures of:

a) Air pollution
b) Water pollution
c) Soil pollution
d) Marine pollution
e) Noise pollution
f) Thermal Pollution
g) Nuclear hazards

- Solid waste management: Causes effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: Floods, earthquake, cyclone and landslides.

UNIT – VI Social issues and the Environment:

a) From unsustainable to sustainable development
b) Urban problems related to energy
c) Water conservation, rain water harvesting, watershed management
d) Resettlement and rehabilitation of people; its problems and concerns, case studies
e) Environmental ethics: Issues and possible solutions
f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies
g) Wasteland reclamation
h) Consumerism and waste products
i) Environment Protection Act
j) Air (Prevention and Control of Pollution) Act
k) Water (Prevention and Control of Pollution) Act
l) Wildlife Protection Act
m) Forest Conservation Act
n) Issues involved in enforcement of environmental legislation
o) Public awareness

UNIT – VII Human population and the Environment.
Population growth, variation among nations.
Population explosion – Family Welfare Programme.
Environment and human health.
Human Rights.
Value Education.
HIV/ AIDS.
Woman and Child Welfare.
Role of Information Technology in Environment and human health.

Case Studies.

REFERENCES:

1. Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India .
3. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.
4. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment ®.
8. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.
9. Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety, Bombay (R).
10. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
11. Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Helhi 284p.
12. Mckinney, M.L. & Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web enhanced Edition 639p.
13. Mhaskar A.K., Mater Hazardous, Tekchno-Sciences Publications (TB).
14. Miller T.G. Jr. Environmental Science, Wadsoworth Publishing Co. (TB).
15. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
16. Rao M.N. & Dutta, A.K. 1987, Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd., 345p
17. Sharma, B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Sciences (TB).
20. Trivedi, R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II Enviro Mdiea (R).
21. Trividi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II Enviro Media (R).
22. Trividi R.K. and P.K. Goel, Introduction to air pollution, Techno Sciences Pub. (TB).
23. Wagner K.D., 1998, Environmental Management, W.B. Saunders Co. Philadelophia, USA 499p.
24. A text bok environmental education G.V.S. Publishers by Dr. J.P. Yadav.

(M) Magazine (R) Reference (TB) Textbook

Note: 1. Examiner will set eight questions. Students will be required to attempt five Questions.

1. The awards of this paper shall not be counted in the award of the Degree/DMC.

GES 203B ENVIRONMENTAL STUDIES FIELD WORK

B.TECH. (ELECTRICAL ENGINEERING)

Semester – III/IV (Common for all Branches)

L	T	P	Credits			
--	--	--	0	Field Work	:	25Marks
				Total	:	25 Marks

FIELD WORK:

- Visit to a local area to document environmental assets – river/ forest/ grassland/ hill/ mountain.
- Visit to a local polluted site-Urban/ Rural/ Industrial/ Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems – pond, river, hill slopes, etc. (Field work equal to 5 lectures hours).

Note: The awards of this paper shall not be counted in the award of the Degree/DMC.

ME 217 B Workshop

B.TECH. (ELECTRICAL ENGINEERING)

Semester – III (Common for all branches)

L	T	P	Credits	Class Work	:	50 Marks
-	-	2	2			

Each student has to undergo a workshop atleast 4 weeks (80-100 hours) at the end of II semester during summer vacations. Out of the four weeks, two weeks would be dedicated to general skills and two weeks training for specialized discipline / department. The evaluation of this training shall be carried out in the III semester

LIST OF JOBS TO BE CARRIED OUT DURING THIS PERIOD

1. To study and prepare different types of jobs on machine tools (lathe, shaper, planer, slotter, milling, drilling machines).
2. To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.
3. To prepare joints for welding suitable for butt welding and lap welding.
4. To study various types of carpentry tools and prepare simple types of wooden joints.
5. To prepare simple engineering components/ shapes by forging.
6. To prepare mold and core assembly, to put metal in the mold and fettle the casting.
7. To study of CNC lathe, CNC Milling and EDM Machines.
8. Any work assigned in Electrical Workshop, Computer Hardware/ Language lab, Electronics Workshop, Biomedical Hardware, Automobile Workshop etc.

This student will prepare job(s)/project as an individual or in a group using workshop in house infrastructure.

The student shall submit a typed report.

Training will be evaluated on the spot out of 20 marks.

The report will be evaluated in the III Semester by a Committee consisting of two teachers.

The student will interact with the committee through presentation to demonstrate his/ her learning. The basis of evaluation will primarily be the knowledge and exposure of students on different kinds of Machines. The committee will evaluate out of 30 marks.

The committee shall submit the awards out of 50 marks.

EE201B ELECTRICAL ENGINEERING MATERIALS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC, AEI
SEMESTER-III

L	T	P	Credits		
3	-	-	3	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Atomic bonding, crystallinity, Miller Indices, X-ray crystallorgraphy, structural imperfections, crystal growth. Free electron theory of metals, factors affecting electric conductivity of metals, thermal conductivity of metals, heat developed in current Carrying conductors, thermoelectric effect, super conductivity.

UNIT-II

Polarization mechanism and dielectric constant, behavior of polarization under impulse and frequency switching, dielectric loss, spontaneous polarization, piezoelectric effect. Origin of permanent magnetic dipoles in materials, classifications, diamagnetism, paramagnetism, ferromagnetism, Magnetic Anisotropy magnetostriction.

UNIT-III

Energy band theory, classification of materials using energy band theory, Hall effect, drift and diffusion currents, continuity equation, P-N diode, volt-amp equation and its temperature dependence. Properties and applications of electrical conducting, semiconducting, insulating and magnetic materials.

UNIT-IV

Special purpose materials, Nickel iron alloys, high frequency materials, permanent magnet materials, Feebly magnetic materials, Ageing of a permanent magnet, Effect of impurities, Losses in Magnetic materials.

TEXT BOOKS:

4. Electrical Engineering Materials: A.J. Dekker; PHI.
5. Solid State Electronic Devices: StreetMan & Banerjee; Pearson.

REFERENCE BOOKS:

3. Electrical Engineering Materials: S.P Seth & P.V Gupta; Dhanpat Rai.
4. *Electrical Properties of Materials,* L.Solymar, D.Walsh, Oxford
5. *Materials Science for Electrical and Electronic Engineers,* Lan P.Jones, Oxford

NOTE:

2. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE203B NETWORK ANALYSIS-I

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-III

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Sinusoidal Steady-State Circuit Analysis: Fundamentals of Circuits, R, L & C Components, Sinusoids, phasors, phasor relationship for circuit elements, impedance & admittance, Network Theorems in AC circuits: Mesh analysis, nodal Analysis, Thevenin's & Norton's theorem, Superposition Theorem, Maximum Power transfer theorem, AC analysis using P-spice, Applications

UNIT-II

AC Power Analysis & Polyphase Circuits: Instantaneous & average power, RMS or effective value, apparent power & power factor, complex power, power relations in AC circuits, two-phase system, three-phase system, wye & delta systems, Balanced three-phase voltages, Balanced wye-wye connections, Balanced wye-delta connections, Balanced delta-delta connections, Balanced delta-wye connections, unbalanced three phase systems, three-phase power, P-spice for polyphase circuits.

UNIT-III

Signals & LTI Systems: Introduction to continuous and discrete signals, their classification and types, periodic waveforms and signal synthesis, LTI systems and their properties; system modeling in terms of differential equations, Transient response of R, L, C circuits for impulse, step, ramp, sinusoidal and exponential signals.

Laplace Transform: Review of properties and applications of Laplace transform of complex waveform. Transient Response of RC, RL, RLC series, parallel, series-parallel circuits to various excitation signals such as step, ramp, impulse and sinusoidal excitations using Laplace transform.

UNIT-IV

Fourier Series & Fourier Transform: Introduction to Frequency domain Representation, Fourier Series Representation of Periodic Signals, Convergence of the Fourier Series, Properties of Fourier Series, Exponential Fourier Series, I/ P O/ P Relationship for LTI Systems using Fourier Series, Circuit applications, Fourier Transform representation of aperiodic & periodic signals, Properties of Fourier Transform, Basic Fourier Transform Pairs, Circuit applications.

TEXT BOOKS:

1. Network Analysis & Synthesis: Umesh Sinha; Satya Prakash Pub.
2. Network Analysis & Synthesis: F.F.Kuo; John Wiley & Sons Inc.
3. *Network Analysis and Synthesis*, SP Ghos, AK Chakarborty, Mc Graw Hill
4. *Electric Circuits and Networks,* K.S. Suresh Kumar, Pearson

REFERENCE BOOKS:

1. Introduction to modern Network Synthesis: Van Valkenburg; John Wiley
2. Network Analysis: Van Valkenburg; PHI
3. Basic circuit theory:Dasoer Kuh; McGraw Hill.
4. A Course in Electrical Circuit Analysis by Soni & Gupta; Dhanpat Rai Publication.
5. Circuit Analysis: G.K. Mithal; Khanna Publication.
6. Networks and Systems: D.Roy Choudhury; New Age International
7. Engineering Circuit Analysis; Hayat & Kemmerley TMH.
8. *Linear Circuits Analysis and Systhesis,* A.Ramakalyan, Oxford

9. *Circuits and Networks,* T.K.Nagsarkar,M.S.Sukjija, Oxford 2-1
10. *Circuit Analysis A Systems Approach,* Russell M.Mersereau,Joel R. Jackson, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.

ECE201B DIGITAL ELECTRONICS

B.TECH. (ELECTRICAL ENGINEERING), CSE, ECE, IC, EEE

SEMESTER-III

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

SECTION- I

UNIT 1- FUNDAMENTALS OF DIGITAL TECHNIQUES

Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra. Review of Number systems. Binary codes: BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes.

UNIT 2-COMBINATIONAL DESIGN USING GATES:

Design using gates, Simplifications of SOP and POS Boolean Expressions, Karnaugh map up to four variables.

SECTION- II

UNIT 3-COMBINATIONAL DESIGN USING MSI DEVICES

Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders / Subtractors, BCD arithmetic circuits, Encoders, Code Converters, Decoders / Drivers for display devices.

Unit 4-SEQUENTIAL CIRCUITS:

Flip Flops : S-R, J-K, T, D, master-slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

SECTION- III

UNIT 5-DIGITAL LOGIC FAMILIES

Switching mode operation of p-n junction, bipolar and MOS. devices. Bipolar logic families:RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, Interfacing of CMOS and TTL families.

UNIT 6-SEMICONDUCTERS MEMORY DEVICES

Memory organizations, Characteristics of memory devices, Classifications of semiconductors memories.

SECTION- IV

UNIT 7-A/D AND D/A CONVERTERS:

Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for D/ A converters. A/ D converters : Quantization, parallel -comparator, successive approximation, counting type, dual-slope ADC, specifications of ADCs.

UNIT 8 PROGRAMMABLE LOGIC DEVICES:

PLA, PAL, FPGA and CPLDs.

TEXT BOOKS :

1. Modern Digital Electronics(Edition III) : R. P. Jain; TMH

REFRENCE BOOKS:

1. Digital Integrated Electronics : Taub & Schilling; MGH
2. Digital Principles and Applications : Malvino & Leach; McGraw Hill.
3. Digital Design : Morris Mano; PHI.
4. *Digital Design,* M.Morris Mano,Michael D. Ciletti, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each section. The candidates will be required to attempt five questions in all selecting at least one from each section. All questions will carry equal marks.

EE205B NUMERICAL METHODS & OPTIMIZATION TECHNIQUES

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-III

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

Unit I

Introduction and Classical Optimization Techniques: Statement of an Optimization problem – design vector – design constraints – constraint surface – objective function – objective function surfaces – classification of Optimization problems.

Classical Optimization Techniques: Single variable Optimization – multivariable Optimization without constraints – necessary and sufficient conditions for minimum / maximum – multivariable Optimization with equality constraints.

Solution by method of Lagrange multipliers – multivariable Optimization with inequality constraint – Kuhn – Tucker conditions.

Unit II

Linear Programming: Standard form of a linear programming problem – geometry of linear programming problems – definitions and theorems, linear simultaneous equations: Elimination method, Gauss and Gauss-Jordan method, Jacobi's method, Gauss-Seidal method.

Relaxation method solution of a system of – pivotal reduction of a general system of equations, simplex method.

Transportation problem finding initial basic feasible solution by north - west corner rule, least cost method and vogel's approximation method.

Unit III

Unconstrained Nonlinear Programming: One – dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method

Unconstrained Optimization Techniques: Univariate method, Powell's method and steepest descent method.

Unit IV

Constrained Nonlinear Programming: Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method, Introduction to convex Programming Problem.

Numerical Solution of Ordinary & Partial Differential Equations: Taylor series method, Euler and modified Euler method, Runge-Kutta methods, Milne's method, Adams-Moulton method, Power method for Eigen values by iteration, Finite difference approximations of partial derivatives, solution of Laplace equation.

Text Books:

1. "Engineering optimization: Theory and practice" – by S. S. Rao, New Age International (P) Limited, 3rd edition, 1998

Reference Books:

1. "Optimization Methods in Operations Research and system Analysis" – K. V. Mital and C. Mohan, New Age International (P) Limited, 3rd edition, 1996
2. Operations Research – by Dr. S. D. Sharma
3. "Operations Research: An Introduction" – by H. A. Taha, PHI Pvt. Ltd., 6th edition

4. Linear Programming – by G. Hadley.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.

EE207B POWER ELECTRONICS DEVICES
B.TECH. (ELECTRICAL ENGINEERING), CSE, ECE, IC, EEE
SEMESTER-III

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Diodes: P-N junction and its V-I Characteristics, Switching characteristics of Diode, half-wave and full wave rectifiers, clipping & clamping, breakdown mechaniusm, avalanche & zener diodes, LED, Construction & characteristics of power diodes.

Transistors: Introduction, Bipolar junction transistor, construction, transistor operations, BJT characteristics, load line, operating point, leakage currents, saturation and cut off mode of operations, Eber-Moll's model.

UNIT-II

Transistor Biasing: Operating point, bias stability, collector to base bias, self-bias, emitter bias, bias compensation, stabilization factors, Construction & characteristics of power transistors

Field Effect Transistors: Junction field effect transistor, pinch off voltage, volt-ampere characteristics, small signal model, MOSFET Enhancement & Depletion mode, V-MOSFET.Common source amplifier, source follower, biasing of FET, applications of FET as a voltage variable resistor (VVR).

UNIT-III

Power Semiconductor Devices: Role & applications of power electronics, review of construction and characteristics of power diode, Schottky diode, power Bipolar Junction transistor, power MOSFETs, Construction & characteristics of thyristors: Thyristor, Silicon controlled switch, Gate Turn-off Thyristor, Insulated Gate Bipolar Transitor, Metal oxide controlled Thyristor, Multilayer devices: Construction & characteristics of DIAC, TRIAC, Reverse Conducting Thyristor, BENISTOR..

UNIT-IV

SCR Firing & Commutating Circuits: Ratings and protections, series and parallel connections, Devices used for firing circuits: UJT firing PUT, SUS, SBS, Firing Circuits: R, RC, UJT, PUT and other firing circuits based on ICs and microprocessors; pulse transformer and opto-coupler, Thyristor Turn-off methods: Line commutation, Load commutation, forced commutation, Commutating circuits, Volatge commutation, current Commutation & Pulse commutation.

TEXT BOOKS:

1. M. H. Rashid, "Power Electronics - Circuits, Devices and Applications", P.H.I Private Ltd. New Delhi, Second Edition, 1994
2. Power Electronics : PC Sen; TMH
3. Power Electronics: P.S Bhimra, Khanna Publication

REFERENCE BOOKS:

1. N. Mohan et.al. "Power Electronics- Converters, Applications and Design", John Wiley & Sons (Asia) Private Ltd., Singapore, 1996.
2. Bimal K Bose, " Modern Power Electronics and AC Drives" PHI
3. R W Erickson and D Makgimovic,"Fundamental of Power Electronics" Springer, 2nd Edition.
4. Thyristorised Power Controllers : GK Dubey, PHI

5. *Electronics Principles,* Sahdev, Dhanpat Rai
6. *Electric Circuits and Electronic Devices,* David A. Bell, Oxford
7. *Microelectronic Circuits Theory and Applications,* Adal S.Sedra,Kenneth C.Smith, Oxford
8. *Electronics Devices & Circuits,* S.K.Sahdev, Dhanpat Rai

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE225B NUMERICAL METHODS & OPTIMIZATION TECHNIQUES LAB

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

WRITE DOWN AND EXECUTE THE FOLLOWING PROGRAMS USING C/C++/MATLAB

1. To solve multivariable optimization without constraints.
2. To solve multivariable optimization with equality constraints.
3. Curve fitting by least - square approximations.
4. To solve the system of linear equations using Gauss-Elimination method.
5. To solve the system of linear equations using Gauss-Seidal iteration method.
6. To solve the system of linear equations using Gauss-Jorden method.
7. To solve the system of unconstrained non-linear equations using Fibonacci method
8. To solve unconstrained optimization technique using Univariate method.
9. To solve unconstrained optimization technique using Powell's method
10. To solve unconstrained optimization technique using Steepest Descent method
11. To find the largest eigen value of a matrix by power-method.
12. To find numerical solution of ordinary differential equations by Euler's method.
13. To find numerical solution of ordinary differential equations by Runge-Kutta method.
14. To find numerical solution of ordinary differential equations by Milne's method.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE231B ELECTRICAL WIRING & INSTALLATION LAB

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC, CHE

SEMESTER-III

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. Introduction of tools, electrical materials, safety procedure, symbols and abbreviations.
2. To study and make stair case wiring connections.
3. To study house wiring i.e., batten, cleat, casing-caping and conduit wirings.
4. To study & make fluorescent tube light connections, CFL & LED lights.
5. To study high pressure mercury vapour lamp (H.P.M.V) & Sodium Lamp.
6. To study circuit & working of SMPS, UPS & Inverter.
7. To study repairing of home appliances such as heater, electric iron, fans etc.
8. To study construction of moving iron, moving coil, electrodynamic & induction type meters.
9. To design & fabricate single phase transformer.
10. To study fuses, relays, contactors, MCBs and circuit breakers.
11. Insulation testing of electrical equipments.
12. To design and fabricate a PCB for a circuit, wire-up and test.
13. Drilling & mounting of components on above PCB.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

ECE221B DIGITAL ELECTRONICS LAB

B.TECH. (ELECTRICAL ENGINEERING), CSE, ECE, IC, EEE

SEMESTER-III

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1	Study of TTL gates –AND,OR,NOT,NAND,NOR,EX-OR,EX-NOR
2	To realize the universal property of NAND gate
3	To realize the universal property of NOR gate
4	Design & realize a given function using K-maps and verify its performance.
5	To verify the operation of Multiplexer & De-multiplexer.
6	To verify the operation of Comparators.
7	To perform Half adder and Full adder
8	To perform Half Substractor and Full substractor.
9	To verify the truth table of S-R,J-K,T & D Type flip flop .
10	To verify the operation of bi-directional shift register.
11	To study analog to digital and digital to analog converter
12	To design & verify the operation of 3 bit synchronous counter.
13	To design & verify the operation of synchronous UP/DOWN decade counter using JK flip flop & derive a seven segment display using the same.
14	To design & verify the operation of asynchronous UP/DOWN decade counter using JK flip flop & derive a seven segmen ment display using the same.
15	Design a 4- bit shift register ,verify its operation and verify the operation of a ring counter and a Johnson counter.

NOTE:

1	The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2	The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3	Electronic gadgets including cellular phones are not allowed in the examination.

EE202B NETWORK ANALYSIS-II

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-IV

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

TWO PORT NETWORKS: Characteristics and Parameters of two port networks**,** Network Configurations**,** short circuit Admittance parameters, open-circuit impedance parameters, Transmission parameters, hybrid parameters, condition for reciprocity & symmetry of two-port networks in different parameters representations. Inter-relationships between parameters of two-port network sets, Expression of input & output impedances in terms of two port parameters, Inter-connection of two port networks, analysis of typical two-port networks, image impedances.

UNIT-II

NETWORK FUNCTIONS & GRAPH THEORY: Terminal pairs or Ports, Network functions for one-port and two-port networks, concept of poles and zeros in Network functions, Restrictions on pole and zero Locations for driving point functions and transfer functions, Time domain behavior from the pole-zero plot. Principles of network topology, graph matrices, network analysis using graph theory.

UNIT-III

FILTERS: Types of filters and their characteristics**,** Filter fundamentals, classification of Filter, Analysis & design of prototype high-pass, prototype low-pass, prototype band-pass, and prototype band-reject Filter, m-derived low-pass & high-pass filters, low-pass filter and high-pass filter with RC & RL circuits, Band pass filter with RLC circuit.

UNIT-IV

NETWORK SYNTHESIS: Hurwitz polynomials**,** Properties of Hurwitz polynomials**,** Positive real functions, procedure of testing of PR functions, concept and procedure of network synthesis, properties of expressions of driving point immitances of LC networks. LC Network synthesis: Foster's I & II Form, Cauer's I & II form, RC & RL Network synthesis, Foster's & Cauer's form of synthesis of lossy networks.

TEXT BOOKS:

1. Network Theory Analysis & Synthesis: Smarajit Ghosh; PHI.
2. Network Analysis & Synthesis: F.F.Kuo; John Wiley & Sons Inc.
3. *Circuit Theory,* A.Chakarbarti, Dhanpat Rai

REFERENCE BOOKS:

1. Introduction to modern Network Synthesis: Van Valkenburg; John Wiley
2. Network Analysis: Van Valkenburg; PHI
3. Basic circuit theory:Dasoer Kuh; McGraw Hill.
4. A Course in Electrical Circuit Analysis by Soni & Gupta; Dhanpat Rai Publication.
5. Circuit Analysis: G.K. Mithal; Khanna Publication.
6. Networks and Systems: D.Roy Choudhury; New Age International
7. Engineering Circuit Analysis; Hayat & Kemmerley TMH.
8. *Network Theory,* K.Channa Venkatesh D. Ganesh Rao, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE204B ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-IV

L	T	P	Credits
3	1	-	4

Class-work Marks	: 25
Exam Marks	: 75
Total Marks	: 100
Duration of Exam	: 3 Hrs

UNIT- I

Fundamentals of Electrical & Electronics measurements: Standards, True Value, Errors (Gross, Systematic, Random); Static Characteristic of Instruments (Accuracy, Precision, Sensitivity, Resolution & threshold). Classification of Instruments(Absolute & Secondary Instruments; Indicating, Recording & Integrating instruments; Based upon Principle of operation), Generalized Instrument (Block diagram, description of blocks), Three forces in Electromechanical indicating instrument, Comparison between gravity & spring controls; Comparison of damping methods & their suitability, bearing supports, pivot-less supports (Simple & taut-band), Scale information.

UNIT- II

MEASURING INSTRUMENTS: Instrument cases (Covers).Construction, operating principle, Torque equation, Shape of scale, use as Ammeter or as Voltmeter (Extension of Range), Use on AC/ DC or both, Advantages & disadvantages, Errors (Both on AC/ DC) of PMMC types, Electrodynamic Type, Moving iron type (attraction, repulsion & combined types), Induction type.

UNIT- III

WATTMETERS & ENEGRY METERS: Construction, operating principle, Torque equation, Shape of scale, Errors, Advantages & Disadvantages of Electrodynamic & Induction type Wattmeters; & single phase induction type Energy meter, Compensation & creep in energy meter.

POWER FACTOR & FREQUENCY METERS: Construction, operation, principle, Torque equation, Advantages & disadvantages of Single phase power factor meters (Electrodynamic & Moving Iron types) & Frequency meters (Electrical Resonance Type, Ferrodynamic & Electrodynamic types).

UNIT- IV

LOW & HIGH RESISTANCE MEASUREMENTS: Limitations of Wheatstone bridge; Kelvin's double bridge method, Difficulties in high resistance measurements, Measurement of high resistance by direct deflection, loss of charge method, Megohm bridge.

A.C. BRIDGES: General balance equation, Ckt. diagram, Phasor diagram, Advantages, disadvantages, applications of Maxwell's, inducance-capacitance, Hays, Owens, Schering & Wein's bridges, Shielding & earthing, wagner's device.

TEXT BOOK:

1. A Course in Elect. & Electronic Measurement & Instrumentation by A. K. Sawhney; Khanna Pub.

REFERENCE BOOKS:

1. Electrical Measurments by E.W. Golding
2. Electronic & Elect. Measurment & Instrumention by J.B.Gupta; Kataria & Sons.
3. Electronic Instrumentation & Measurment Technique, W.D. Cooper & A.D. Helfrick.
4. Measuring Systems by E.O. Doeblin; TMH.

NOTE:

3. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.
4. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.

EE206B ELECTRICAL MACHINES – I

B.TECH. (ELECTRICAL ENGINEERING)

SEMESTER-IV

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Single Phase Transformer: Principle, construction, E.M.F equation, operation of transformer, phasor diagram, Equivalent parameter determination, Equivalent circuit, voltage regulation, losses, separation of iron losses, efficiency, All day efficiency, open-circuit test, short circuit test, Sumpner's test, P.U representation, Parallel operation of 1-Phase transformer.

UNIT-II

Auto-transformer: Principle, construction, comparison with two winding transformers, saving of conductor material and its applications.

Three Phase Transformer: Principle, construction, connection, operation, advantages, various types of connection of three phase transformer, Inrush of magnetizing current, Harmonic phenomenon, cooling, rating, and parallel operation.

Phase-Conversion: Three to two phase, three to six phase and three to twelve phase conversions, Scott connection.

Instrument Transformer: Current transformer(C.T), Potential transformer (P.T) and their applications.

UNIT-III

D.C Generator: Principal, Construction, E.M.F equation, types, characteristics, voltage buildup phenomenon in self excited generator, applications, simplex lap and wave windings, armature reaction, commutation, method of improving commutation, parallel operation.

UNIT-IV

D.C Motor: Principle, construction, torque equation, types, characteristics, starting and starters, speed control, losses, efficiency, swinburne's test, hopkinson's test, braking.

TEXT BOOKS:

1. Electric Machines: I.J.Nagrath and D.P.Kothari, TMH, New Delhi.
2. Performance & Design of D.C. Machines: A.E. Clayton & N.N. Hancock; ELBS

REFERENCE BOOKS:

1. Electric Machinery, Fitzgerald & Kingsley, MGH.
2. Theory of alternating current machinery, A.S. Langsdorf , TMH.
3. Electrical Machines, P.S.Bhimbra, Khanna Publishers Delhi
4. *Electric Machinery and Transformers,* Irving Kosow,
5. *Electric Machinary and Transformers,* Bhag S.Guru, Huseyin R.Hiziroglu, Oxford

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE208B ELECTROMAGNETIC THEORY

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-IV

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

–

UNIT-I

STATIC & STEADY FIELDS: Coulomb's Law, Gauss's Law, potential function, field due to a continuous distribution of charge, equi-potential surfaces, Gauss's Theorem, Poison's equation, Laplace's equation, method of electrical images, capacitance, electro-static energy, boundary conditions, the electro-static uniqueness theorem, far field of a charge distribution, Dirac-Delta representation for a point charge and an infinitesimal dipole. Faraday's law of Induction, Ampere's Work law in the differential vector form, Ampere's law for a current element, magnetic field due to volume distribution of current and the Dirac-delta function, Ampere's Force Law.

UNIT-II

TIME VARYING FIELDS: magnetic vector potential, vector potential (Alternative derivation), far field of a current distribution, equation of continuity, Equation of continuity for time varying fields, inconsistency of Ampere's law, Maxwell's field equations and their interpretation, solution for free space conditions, electromagnetic waves in a homogeneous medium, propagation of uniform plane-wave, relation between E & H in a uniform plane-wave, wave equations for conducting medium, Maxwell's equations using phasor notation, wave propagation in a conducting medium, conductors, dielectrics, wave propagation in good conductor and good dielectric, depth of penetration,.

UNIT-III

POLARIZATION, REFLECTION AND REFRACTION OF E M WAVES: Polarization,(linear, circular and elliptical), Reflection and refraction of plane waves at the surface of a perfect conductor & perfect dielectric (both normal incidence as well as oblique incidence), Brewester's angle and Total Marks internal reflection, reflection at the surfaces of a conductive medium, surface impedance.

UNIT-IV

TRASMISSION LINE THEORY: Transmission-line analogy, Poynting theorem, interpretation of E x H, power loss in a plane conductor. Transmission line as a distributed circuit, transmission line equation, travelling & standing waves, characteristic impedance, input impedance of terminated line, reflection coefficient, VSWR, Smith's chart and its applications.

TEXT BOOKS:

1. Electro-magnetic Waves and Radiating System: Jordan & Balmain, PHI.
2. *Electromagnetics for Engineers*, Fawwaz T. Ulaby, Pearson
3. *Electromagnetic Field Theory and Transmission Lines*, G.S.N. Raju, Pearson

REFERENCE BOOKS:

1. Engineering Electromagnetics: Hayt; TMH
2. Electro-Magnetics: Krauss J.DF; Mc Graw Hill.
3. Electromagnetic Waves & Transmission Lines by R.S. Rao, PHI India.
4. Electromagnetics by Sudoko, Oxford Press.
5. *Classical Electromagnetism*, Jerrold Franklin, Pearson
6. *Elements of Engineering Electromagnetics*, Nannapaneni Naryana Rao, Pearson
7. *Field and Wave Electromagnetics*, David K.Cheng, Pearson

8. *Elements of Electromagnetic Fields*, P. S. Seth, Dhanpat Rai
9. *Engineering Electromagnetics*, W H Hayt, J A Buck, Mc Graw Hill

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE210B CONTROL SYSTEMS ENGINEERING
B.TECH. (ELECTRICAL ENGINEERING), EEE,IC
SEMESTER-IV

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

A) INTRODUCTORY CONCEPTS: System / Plant model, types of models, illustrative examples of plants & their inputs and outputs, controller, servomechanism, regulating system, linear time-invariant (LTI) system, time-varying system, causal system, open loop & closed loop control system & their illustrative examples, continuous time and sampled data control systems. Effects of feedback on sensitivity (to parameter variations), stability, external disturbance (noise), overall gain, etc. Introductory remarks about non-linear control systems.

B) MATHEMATICAL MODELLING: Concept of transfer function, relationship between transfer function and impulse response, order of a system, block diagram algebra, signal flow graphs: Mason's gain formula & its application, characteristic equation, derivation of transfer functions of electrical and electromechanical systems. Transfer functions of cascaded and non-loading cascaded elements.

UNIT-II

TIME DOMAIN ANALYSIS: Typical test signals, time response of first order systems to various standard inputs, time response of 2nd order system to step input, relationship between location of roots of characteristics equation, ω and ω_n, time domain specifications of a general and an under-damped 2nd order system, steady state error and error constants, dominant closed loop poles, concept of stability, pole-zero configuration and stability, necessary and sufficient conditions for stability, Hurwitz stability criterion, Routh stability criterion and relative stability.

UNIT-III

ROOT LOCUS TECHNIQUE: Root locus concept, development of root loci for various systems, stability considerations.

FREQUENCY DOMAIN ANALYSIS: Relationship between frequency response and time-response for 2nd order system, polar, Nyquist, Bode plots, stability, Gain-margin and Phase Margin, relative stability, frequency response specifications.

UNIT-IV

COMPENSATION: Necessity of compensation, compensation networks, application of lag and lead compensation, basic modes of feedback control, proportional, integral and derivative controllers, illustrative examples.

CONTROL COMPONENTS: Synchros, servomotors, stepper motors, magnetic amplifier.

TEXT BOOK:

4. Control System Engineering: I.J. Nagrath & M. Gopal; New Age Publishers.

REFERENCE BOOKS:

1. Automatic Control Systems: B.C. Kuo, PHI. Publishers.
2. Modern Control Engg: K. Ogata; PHI. Publishers.
3. Control Systems - Principles & Design: Madan Gopal; Tata Mc Graw Hill. Publishers.
4. Modern Control Engineering, R.C. Dorf & Bishop; Addison-Wesley Publishers.
5. Control Systems, R.C.Sukhla, Dhanpat Rai
6. Control Systems, Ashfaq Hussain, Haroon Ashfaq, Dhanpat Rai

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE222B NETWORK ANALYSIS LAB

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-IV

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. Transient response of RC circuit.
2. Transient response of RL circuit.
3. Transient Response of RLC Circuit
4. To calculate and verify "Z" parameters of a two port network.
5. To calculate and verify "Y" parameters of a two port network.
6. To determine equivalent parameter of parallel connections of two port network.
7. To plot the frequency response of low pass filter and determine half-power frequency.
8. To plot the frequency response of high pass filter and determine the half-power frequency.
9. To plot the frequency response of band-pass filter and determine the band-width.
10. To calculate and verify "ABCD" parameters of a two port network.
11. To calculate and verify "h" parameters of a two port network.
12. To determine equivalent parameter of series connections of two port network.
13. To synthesize a network of a given network function and verify its response.
14. Introduction of P-Spice.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE224B ELECTRICAL MEASURMENTS & MEASURING INSTRUMENTS LAB

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-IV

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. To identify the meters from the given lot.
2. To convert & calibrate a D'Arsonval type galvanometer into a voltmeter & into an ammeter.
3. To calibrate an energy meter with the help of a standard wattmeter & a stop watch.
4. To measure power & p.f. by 3-ammeter method.
5. To measure power & p.f. by 3-voltmeter method.
6. To measure power & p.f. in 3-phase circuit by 2-wattmeter method.
7. To measure capacitance by De-Sauty's bridge.
8. To measure inductance by Maxwell's bridge.
9. To measure frequency by Wien's bridge.
10. To measure the power with the help of C.T. & P.T.
11. To measure magnitude & phase angle of a voltage by rectangular type potentiometer.
12. To measure magnitude & phase angle of a voltage by polar type potentiometer.
13. To measure low resistance by Kelvin's double bridge.
14. To measure high resistance by loss of charge method.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE226B ELECTRICAL MACHINES-I LAB

B.TECH. (ELECTRICAL ENGINEERING)

SEMESTER-IV

L	T	P	Credits		
-	-	3	2	Class-work Marks	: 40
				Exam Marks	: 60
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

LIST OF EXPERIMENTS:

1. To find turns ratio & polarity of a 1-phase transformer.
2. To perform open & short circuit tests on a 1-phase transformer.
3. To perform Sumpner's back to back test on 1-phase transformers.
4. Parallel operation of two 1-phase transformers.
5. To convert three phase to two-phase By Scott-connection.
6. To perform load test on DC shunt generator.
7. Speed control of DC shunt motor.
8. Swinburne’s test of DC shunt motor.
9. Hopkinson’s test of DC shunt machines.
10. Ward Leonard method of speed control of D.C. motor.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

BOOKS:

1. Experiments in basic Electrical Engineering – S.K.Bhattacharya & K.M.Rastogi (New Age International,Publishes).
2. Practicals in Electrical Engineering – N.K.Jain (Dhanpat Rai Publishing Company Pvt. Ltd.)

EE230B CONTROL SYSTEMS ENGG. LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-IV

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. To study A.C. servo motor and to plot its torque-speed characteristics.
2. To study D.C. servo motor and to plot its torque speed characteristics.
3. To study the magnetic amplifier and to plot its load current v/s control current characteristics for:
   (a) series connected mode
   (b) parallel connected mode.
4. To plot the load current v/ s control current characteristics for self exited mode of the magnetic amplifier.
5. To study the synchro & to:
   (a) Use the synchro pair (synchro transmitter & control transformer) as an error detector.
   (b) Plot stator voltage v/ s rotor angle for synchro transmitter i.e. to use the synchro transmitter as position transducer.
6. To use the synchro pair (synchro transmitter & synchro motor) as a torque transmitter.
7. (a) To demonstrate simple motor-driven closed-loop position control system.
   (b) To study and demonstrate simple closed-loop speed control system.
8. To study the lead, lag, lead-lag compensators and to draw their magnitude and phase plots.
9. To study a stepper motor & to execute microprocessor or computer-based control of the same by changing number of steps, direction of rotation & speed.
10. To implement a PID controller for level control of a pilot plant.
11. To implement a PID controller for temperature control of a pilot plant.
12. To study the MATLAB package for simulation of control system design.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

GPEE 202B GENERAL PROFICIENCY & ETHICS							
B. Tech. Semester – IV (Electrical Engineering)							
L	**T**	**P**	**Credits**		**Examination**	**:**	**75Marks**
1	**--**	**--**	**2**		**Total**	**:**	**75 Marks**

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him / her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/ her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance ---

II. Extra Curricular Activities / Community Service, Hostel Activities **(8 Marks)**

III Technical Activities / Industrial, Educational tour **(8 Marks)**

IV Sports/games **(14 Marks)**

V Moral values & Ethics **(15 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

C. A student will support his/ her achievement and verbal & communicative skill through presentation before the committee.
(30 Marks)

C. Moral values & Ethics

Syllabus - Process for Value Education, self-evaluation concept and process.

A minor test will be conducted during the semester and It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1	Chairperson of the Department	Chairman
2	Senior Most Faculty Counselor	Member
3	Vice- Chancellor's Nominee	Member

Affiliated Colleges:

1	Director/Principal	Chairman
2	Head of the Department/Sr. Faculty	Member
3	External Examiner to be appointed by the University	Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

EE301B ELECTRICAL MACHINES – II
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-V

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Poly-phase Induction Motor: Construction, double cage and deep bar motors, production of rotating magnetic field, Principal of operation, torque production, testing, performance characteristics, applications, development of equivalent circuit, circle diagram, starting methods.

UNIT-II

Poly-phase Induction Motor: Methods of speed control - stator voltage control, stator resistance control, frequency control, rotor resistance control, slip power recovery control

Induction Generator: Principle of operation, types and applications.

Single Phase motors: Double revolving field theory, cross field theory, circuit model of single phase induction motor, different types of single phase motors and their applications.

UNIT-III

Principle, construction, EMF equation, armature winding, armature reaction, equivalent circuit, voltage regulation- synchronous reactance method, Rothert's mmf method, Potier triangle method, Output power equation, power angle curve, two reactance theory, slip test,

UNIT-IV

Three Phase Synchronous Generators: Transient and sub-transient reactance, synchronization, parallel operation.

Three Phase Synchronous Motor: Construction, Principle of operation, Equivalent circuit, torque, power developed, starting, V-curve, Hunting-causes and effects, synchronous condenser, applications.

TEXT BOOKS:

1. Electric Machines**:** I.J.Nagrath and D.P. Kothari, TMH, New Delhi.
2. Electric Machinery, Fitzgerald and Kingsley, MGH.
3. Electrical Machines, P.S. Bhimbra, Khanna Publishers Delhi
4. Electric Machines, Charles I. Hubert, Pearson
5. Electric Machines,Ashfaq Hussain, Dhanpat Rai

REFERENCE BOOKS:

1. Theory of alternating current machinery: A.S. Langsdorf (TMH)
2. Generalized theory of Electrical Machines: P.S. Bhimbra(Khanna Pub.)

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE303B DIGITAL CONTROL SYSTEMS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-V

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT- I

INTRODUCTION:
Terminology: continuous time, discrete-time & digital signals; Basic structure of a computer-controlled system & brief description of its blocks; Computer-based Control trends.

SINGAL PROCESSING IN DIGITAL CONTROL:
Advantages & problems of digital control, General principles of signal conversion: operation by A/ D & D/ A converters, A/ D and D/ A converter circuits; Unit sample sequence; Unit step sequence; Unit sinusoidal sequence; Time-domain models for discrete-time system (state variable models, Difference Equation models & Impulse response models).

UNIT- II

TRANSFORM DOMAIN PROCESSING:
Ideal sampler, Impulse modulation; Definition of Z-transform; The Z-transforms of typical functions such as Unit sample sequence, Unit step sequence, sampled ramp function, sampled exponential function, sampled sinusoids; Operations with Z transform such as shifting (forward & backward); Z-transform Inversion; Final value & Initial value theorems; Transfer function models; Unit delayer Transfer function; Dynamic response; Stability in z-plane; Jury Stability test; Z-plane poles v/ s stability (& the nature of response functions); The Hold operation, ZOH; Aliasing; Sampling theorem; Mapping s-plane to z-plane, mapping constant Zeta (ξ) and ω_n plots from s to z-plane; Bilinear transformation.

UNIT- III

MODELS OF DIGITAL CONTROL DEVICES & SYSTEMS:
Basic digital control scheme; z-domain description of sampled continuous-time plants, model of ADC & DAC, Interconnection of discrete-time & continuous time systems & their equivalent transfer functions; Implementation of digital controllers, Recursive realizations: direct, cascade & parallel realizations, Non-recursive realization; PID Controller: introduction to analog PID & its tuning through Ziegler-Nichols tuning methods (Process reaction curve and Ultimate Gain & Period methods); Digital PID controller: Positional & velocity forms; Tuning rules for digital PID.

UNIT- IV

DESIGN OF DIGITAL CONTROL ACGORITHMS
Basic structure of digital control system; Routes to the design of digital Controller, z-plane specifications of control system design: steady state accuracy, Steady state errors & error constants for type -0,-1,-2 systems, Transient accuracy, dominant poles, Effect of extra zero & pole on discrete time 2^{nd} order system; Digital compensator design using frequency response plot; Digital compensation design using root locus plot.

TEXT BOOKS:
1. M. Gopal, "Digital Control Engg.", Pub: New Age International, New Delhi.
2. M. Gopal, "Digital Control & State Variable Methods (Conventional and Intelligent Control System)", Pub: Tata McGraw Hill Education Pvt. Ltd., New Delhi.

REFERENCE BOOKS:

1. B.C. Kuo, “Digital Control Systems”; OXFORD UNIVERSITY PRESS..
2. K. Ogata, “Discrete-time Control Systems”; Pub: Pearson Education, New Jersey.
3. Phillips, C.L. & H.T. Nagla, Jr., “Digital Control System Analysis”, Pearson Education, New Jersey.
4. Hopis, C.H. and G.B. Lemont, “Digital Control System: Theory, Hardware & Software”; Pub: McGraw-Hill, New York.
5. Pulse and Digital Circuits : Venkata Rao K. Rama Sudha K. Manmadha Rao G. , Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

ECE311B INTEGRATED ELECTRONICS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-V

L	T	P	Credits
3	1	-	4

Class-work Marks	: 25
Exam Marks	: 75
Total Marks	: 100
Duration of Exam	: 3 Hrs.

SECTION- I

UNIT 1 - TRANSISTOR ANALYSIS USING H-PARAMETER

Introduction to hybrid model, h-parameters (CE, CB, CC configurations), analysis of a transistor amplifier circuits using h-parameters, hybrid P model at high frequencies.

UNIT 2 - SINGLE AND MULTISTAGE AMPLIFIERS

Classification of amplifiers, distortion in amplifiers, frequency response of an amplifier, step response of an amplifier, pass-band of cascaded stages, RC-coupled amplifier, low frequency response of RC coupled stage, effect of an emitter bypass capacitor on low Frequency response, multistage CE amplifier.

SECTION- II

UNIT 3 - FEEDBACK AMPLIFIERS

Feedback concept, transfer gain with feedback, general characteristics of negative feedback amplifiers, input resistance, output resistance, voltage series feedback, current series feedback, current shunt feedback, voltage shunt feedback.

UNIT 4 - OSCILLATORS

Sinusoidal oscillators, Barkhausen criteria, R-C phase shift oscillator, general form of oscillator circuit, wien-bridge oscillator, crystal oscillator.

SECTION- III

UNIT 5 - POWER AMPLIFIERS:

Class A, B, and C operations; Class A large signal amplifiers, higher order harmonic distortion, efficiency, transformer coupled power amplifier, class B amplifier : efficiency & distortion; class A and class B push-pull amplifiers; class C power amplifier.

UNIT 6 - OPERATIONAL AMPLIFIERS:

Ideal and practical operational amplifiers, inverting and non-inverting amplifier, differential amplifier, emitter coupled differential amplifier, transfer characteristics of a differential amplifier, offset error : voltage and current, common mode rejection ratio (CMRR) .

SECTION- IV

UNIT 7 - LINEAR APPLICATIONS OF OPERATIONAL AMPLIFIERS:

Scale changer, phase shifter, adder, voltage to current converter, current to voltage converter, DC voltage follower, Bridge amplifier, AC coupled amplifier, AC voltage follower, Integrator, differentiator.

UNIT 8 NON-LINEAR APPLICATIONS OF OPERATIONAL AMPLIFIERS:

Comparators, sample & hold circuits, Logarithmic amplifier, anti-log amplifier, logarithmic multiplier, waveform generators, Miller & Bootstrap sweep generators, regenerative comparator (Schmitt Trigger), multivibrators, ADC.

TEXT BOOKS :

1. Integrated Electronics: Milman Halkias, TMH.
2. Electronic circuit analysis and design (Second edition): D.A.Neamen; TMH

REFRENCE BOOKS:

1. Operational Amplifiers: Gaikwad
2. Microelectronic Circuits: Sedra & Smith.

3. Electronics Devices & Circuits: Boylestad & Nashelsky ; Pearson.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each section. The candidates will be required to attempt five questions in all selecting at least one from each section. All questions will carry equal marks.

EE305B POWER SYSTEMS-I
B.TECH. (ELECTRICAL ENGINEERING), EEE
SEMESTER-V

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Structure of a power system, **i**ndoor and outdoor substations, equipment for substations, layout, auxiliary supply, Radial, ring mains and network distribution system, comparison of various types of ac and dc systems, Calculation of line parameters.

UNIT-II

PERFORMANCE OF TRANSMISSION LINES: models of short, medium and long transmission lines, circle diagram, Ferranti effect, proximity effect, capacity of synchronous condenser, voltage control, MECHANICAL DESIGN: Sag and stress calculations, effect of ice and wind, dampers.

UNIT-III

INSULATORS & CABLES: Types, insulating materials, voltage distribution over insulator string, equalizer ring. Types of LV and HV cables, grading of cables, capacitance, ratings.

UNIT-IV

CORONA: Phenomenon, critical voltage, power loss, reduction in losses, radio-interference, and HVDC transmission – types of links, advantages and limitations.

TEXT BOOKS:

1. Power System Analysis- John J. Grainger, William D. Stevenson: McGraw-Hill
2. Power System Engg: I.J.Nagrath and D.P.Kothari (TMH)
3. Power System Engineering: S K Gupta, Umesh Publication, Delhi
4. Power Systems Analysis : Arthur R.Bergen Vijay Vittal, Pearson
5. Basic Electrical Engineering: T.K.Nagsarka M.S.Sukjija, Oxford

REFERENCE BOOKS:

1. Elements of power system analysis: W.D.Stevenson (MGH)
2. Electric Power System: B.M.Weedy, John Wiley & Sons.
3. Transmission & Distribution of Electrical Engineering: H.Cotton.
4. Transmission & Distribution of Electrical Engineering: Westing House & Oxford Univ. Press, New Delhi.
5. Electric Power: S.L.Uppal (Khanna Pub.)
6. Electrical power: J.B.Gupta (S.K.Kataria & Sons).
7. Power System Engineering: B. R. Gupta.
8. *Electric Power Transmission and Distribution,* S.Sivanagaraju S.Satyanarayana, Pearson
9. *Electric Power Distribution and Transmission,* Luces M.Faulkenberry Walter Coffer, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE307B POWER ELECTRONICS CIRCUITS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-V

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Design Consideration: Design of Snubber circuit, driver circuit, temperature control and heat sink for Power MOSFET, GTO and IGBT. Design of inductor, capacitor, LC and LCL filters.
AC REGULATORS: Types of regulator, equation of load current, calculation of extinction angle, output voltage equation, three phase regulator.

UNIT-II

CHOPPERS: Basic scheme, output voltage control techniques, one, two, and four quadrant choppers, step up chopper, voltage commutated chopper, current commutated chopper, MOSFET and IGBT based choppers.
CONVERTERS: Half and fully controlled converters, load voltage waveforms, output voltage equation, continuous and discontinuous modes of operation, input power factor of converter, reactive power demand, effect of source inductance, introduction to four quadrant / dual converter, power factor improvement techniques, forced commutated converter, MOSFET and IGBT based converters.

UNIT-III

Modulation Techniques: Pulse width modulation, Sinusoidal Pulse width modulation(SPWM), Spacevector modulation (SVM), Selective Harmonic Elimination PWM, Hysteresis modulation, and comparison among different PWM techniques.
INVERTERS: IGBT/ MOSFET based Half bridge and full bridge inverters, Basic circuits of Voltage source inverter, Current Source inverter, resonant inverter, Introduction to multilevel inverters.
CYCLOCONVERTERS: Basic principle of frequency conversion, types of cycloconverter, non-circulating and circulating types of cycloconverters.

UNIT-IV

CONTROL DESIGN and SIMULATIONS: control principles of power electronic circuits, d-q, p-q theories and their control applications, Feedback control and simulation of inverter/ converter and choppers using P and PI control. Phase lock loop control

TEXT BOOKS:

1. M. H. Rashid, "Power Electronics - Circuits, Devices and Applications", P.H.I Private Ltd. New Delhi, Second Edition, 1994
2. Power Electronics : PC Sen; TMH
3. Power Electronics: P.S Bhimra, Khanna Publication

REFERENCE BOOKS:

1. N. Mohan et.al. "Power Electronics- Converters, Applications and Design", John Wiley & Sons (Asia) Private Ltd., Singapore, 1996.
2. Bimal K Bose, " Modern Power Electronics and AC Drives" PHI
3. R W Erickson and D Makgimovic,"Fundamental of Power Electronics" Springer, 2nd Edition.
4. Thyristorised Power Controllers : GK Dubey, PHI
5 Semiconductor Devices and Circuits: Aloke K.Dutta, Oxford
6. Power Electronics : V.R.Moorthi, Oxford 2-1

7. Power Electronic Systems Theory & Design : Jai P. Agrawal, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE309B MICROPROCESSOR (8085), INTERFACING & APPLICATIONS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-V

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Evolution of microprocessors, Introduction to 8085 microprocessor, Pin configuration and Internal Architecture of 8085, Instruction format, Concept of opcodes and operands, instruction set, Classification of instructions , addressing modes, programming examples based on data transfer, arithmetic and logical operations. Looping and branching etc.

UNIT-II

Introduction to instruction cycle, machine cycle and T-state, Instruction execution and Timing diagrams,. Stacks and subroutines, Interrupts of 8085, types of interrupts. Interrupt related instructions, Interrupt priority structure, Masking of interrupts, Programming examples based on subroutine concepts and interrupts.

UNIT-III

Peripheral devices and their interfacing, The interfacing with 8255 PPI chip, its Architecture, control word and operating modes, Introduction to DMA process & its controller chip 8257and 8237, programmable interrupt controller 8259 and its operating modes, programmable interval timer 8253/8254 and its modes of operation.

UNIT-IV

Interfacing & applications of 8085 Microprocessor, Interfacing issues, Interfacing ADC & DAC, Interfacing memory, Microprocessor based voltage, current, frequency and power measurement schemes, Microprocessor based protective relays, stepper motors, LEDs, DC motors and traffic control.

TEXT BOOKS:

1. Ramesh S. Gaonkar, “Microprocessor Architecture, Programming & Applications with the 8085,” Penram International Publishers.
2. Sunil Mathur, “Microprocessor 8085 and its Interfacing,” PHI.
3. A.Nagoor Kani, “8085 microprocessor and its applications”, TMH.

REFERENCE BOOKS:

1. B.Ram, “Fundamentals of Microprocessors & Microcomputers,” Dhanpat Rai Publications, Delhi.
2. P.K.Ghosh and P.R.Sridhar, “0000 to 8085: Introduction to Microprocessors for Engineers and Scientists,” PHI.
3. N. Senthil Kumar,M Saravanan and S. Jeevnanthan, “ Microprocessors and Microcontrollers,” Oxford University Press.
4. Renu Singh and B.P.Singh, “Microprocessors: Interfacing and Applications,” New Age International Publishers.

NOTE:

1. *Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of ethics and sports is given in general proficiency syllabus.

ECE331B INTEGRATED ELECTRONICS LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
B.TECH. SEMESTER-V

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1 Design & measure the frequency response of an RC coupled amplifier using discrete components.
2 Design a two stage RC coupled amplifier and determine the effect of cascading on gain & bandwidth.
3 Study the effect of voltage series, current series, voltage shunt, and current shunt feed-back on amplifier using discrete components.
4 Design & realize inverting amplifier, non-inverting and buffer amplifier using 741 Op Amp.
5 Verify the operation of a differentiator circuit using 741 op amp and show that it acts as a high pass filter.
6 Verify the operation of a integrator circuit using 741 op amp and show that it acts as a low pass filter.
7 Design and verify the operations of op amp adder and subtractor circuits.
8 Plot frequency response of AC coupled amplifier using op amp 741 and study the effect of negative feedback on the bandwidth and gain of the amplifier.
9 Design & realize using op amp 741, Wein -bridge oscillator.
10 To design & realize using op amp 741, square wave generator.
11 To design & realize using op amp 741, logarithmic amplifier & VCCS.

NOTE:

4. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
5. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
6. Electronic gadgets including cellular phones are not allowed in the examination.

EE321B ELECTRICAL MACHINES-II LAB
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-V

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. To perform the open circuit test and block rotor test on 3 phase induction motor and draw the circle diagram.
2. Speed control of induction motor by rotor resistance control.
3. To conduct the load test to determine the performance characteristics of the I.M.
4. To compute the torque v/s speed characteristics for various stator voltages.
5. To perform the open circuit test and block rotor test on single-phase induction motor and determine equivalent circuit parameters.
6. To perform load test on a universal motor and determine the performance with dc/ ac supply voltage.
7. To draw Voltage Vs load Characteristics of 3 phase synchronous generator, and draw input vs. Output power.
8. To perform O.C. test on synchronous generator. And determine the full load regulation of a three phase synchronous generator by synchronous impedance method
9. Determination of direct axis and quadrature axis reactances of synchronous machines.
10. To plot V- Curve of synchronous motor.
11. To study the parallel operation of synchronous generators.
12. Determination of sequence impedances of synchronous machine for various stator voltages.

NOTE:

1. The students will be required to perform the 8 experiments/ excersices from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

BOOKS:

1. Practicals in Electrical Engineering – Dr. N.K.Jain (Dhanpat Rai Publishing Company)
2. Experiments in basic Electrical Engineering –Bhattacharya & Rastogi

EE327B POWER ELECTRONICS LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-V

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. Study & plot of characteristics of diode, thyristor and triac.
2. Study & plot of characteristics of transistor and MOSFET.
3. Study & experimentation of firing angle control of R and R-C firing circuits.
4. Study & firing angle control of UJT firing circuit.
5. Study & execution of complementary voltage commutation using a lamp flasher.
6. Study & execution of complementary voltage commutation using ring counter.
7. Study & experimentation of thyristorised d-c circuit breaker.
8. Study & execution of A.C. phase control.
9. Study & execution of full wave converter.
10. Study & execution of dc chopper.
11. Study & execution of series inverter.
12. Study & execution of bridge inverter.
13. Study & experimentation of single phase cycloconverter.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE329B MICROPROCESSOR (8085), INTERFACING & APPLICATIONS LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
B.TECH. SEMESTER-V

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. To study the architecture of 8085 microprocessor & familiarization with its hardware, commands & operation of Microprocessor kit.
2. Write an assembly language program for (i) addition of two 8-bit numbers and(ii) addition of two 16-bit numbers.
3. Write a well-documented program for:
   (i) subtraction of two 8-bit numbers
   (ii) subtraction of two 16-bit numbers
5. (i) Write a well documented program for multiplication of two 8-bit numbers by repeated addition method. Also test for typical data.
   (ii) Write a well-documented program for multiplication of two 8-bit numbers by bit rotation method. Also test for typical data.
6. (i) Write a well-documented program for division of two 8-bit numbers by repeated subtraction method. Test for typical data.
   (ii) Write a well-documented program for dividing two 8-bit numbers by bit rotation method. Test for typical data.
7. (i) Write an assembly language program for finding largest number from an array.
   (ii) Write an assembly language program for finding smallest number from an array.
8. (i) Write a program for arranging an array of numbers in descending order.
   (ii) Write a program in 8085 for arranging an array of numbers in ascending order.
9. Write a program in 8085 for finding square of a number using Look-up table.
10. Write an Assembly Language program to control the operation of LEDs and switches using ports of 8255.
11. To measure an electrical quantity using microprocessor & 8255.
12. Write a program to interface a 2-digit number using seven-segment LEDs. Use 8085 microprocessor and 8255 PPI chip.
13. Write a program to control the operation of stepper motor using 8085 microprocessor & 8255 PPI chip.
14. To study the interfacing ADC with 8085.
15. To study the interfacing ADC with 8085.
16. To generate a square waveform of 10 kHz using 8253/8254.
17. To control the operation of DC motor using 8085.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE333B PROFESSIONAL TRAINING – I

B.TECH. (ELECTRICAL ENGINEERING)

SEMESTER-V

L	T	P		
-	-	2	Class-work Marks	: 50
			Total Marks	: 50
			Credits	: 2

At the end of 4th semester, each student would undergo four weeks Professional Training in an Industry / Institute / Professional Organization / Research Laboratory, Training Centre, etc. with the prior approval of the Training and Placement Officer of the University and submit to the department a typed report along with a certificate from the organization.

The typed report should be in a prescribed format.

The report will be evaluated in the 5th Semester by a Committee consisting of two to three teachers from different specializations to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the knowledge and exposure of the student towards different processes and the functioning of the organization.

The student will interact with the committee through presentation to demonstrate his / her learning.

Teachers associated with evaluation work will each be assigned 2 periods per week load.

EE302B POWER SYTEMS – II
B.TECH. (ELECTRICAL ENGINEERING), EEE
SEMESTER-VI

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

FAULT ANALYSIS: Transients on a transmission line, short circuit of synchronous machine at no load and on full load, Symmetrical component transformation, phase shift in star-delta transformation, sequence impedances, Single line to ground fault, line to line fault, double line to ground fault, open conductor fault.

UNIT-II

CIRCUIT BREAKERS: Theory of arc initiation and interruption, restriking voltage transients, current chopping, circuit breaker ratings, duties of switch gear, automatic switch, air circuit breaker, bulk oil, minimum oil, air blast, SF_6 CB, vacuum and DC circuit breakers, Testing of Circuit breaker.

UNIT-III

PROTECTIVE RELAYS & APPLICATION: Essential qualities of relay, relay classification, principal types of electromagnetic relays, i.e. attracted armature, induction disc, induction cup types, Over-current, instantaneous over-current, IDMT, directional and differential relays, distance relays, plain impedance, mho, reactance relays, zone of protection, primary and backup protections, transmission line & feeder protection, pilot wire and carrier current protection, Transformer, generator, motor and bus zone protection.

UNIT-IV

STATIC & DIGITAL RELAYS: Classification of static relays, amplitude and phase comparators, block-spike and block-average comparators, rectifier type relays. Introduction to digital relay: basic principles. Application of microprocessors and computers - recent Trends. Travelling wave relay, relaying schemes based on microwave and optical fiber link.

TEXT BOOKS:

1. Power System Analysis- John J. Grainger, William D. Stevenson: McGraw-Hill
2. Power System Engineering: S K Gupta, Umesh Publication, Delhi
3. Power System protection and switchgear –B.Ram, D.N.Vishvakarma : TMH.
4. Switchgear and protection - S.S.Rao : Khanna Pub.

REF. BOOKS:

1. Protective Relays -Their Theory and Practice Vol.I & II: W.Van Warrington.
2. Electric Power Systems- B. M. Weedy, B. J. Cory: John Wiley& Sons.
3. Advanced power system analysis and dynamics: L.P.Singh, Wiley Eastern N.Delhi.
4. Power System Engg: I.J. Nagrath and D.P. Kothari(TMH).
5. Digital Protection: Protective relay from Electro Mechanical to Microprocessor- L.P.Singh,Wiley Eastern.

7. A course in Electrical Power - Soni, Gupta and Bhatnagar - Dhanpat Rai & Sons.
8. *Modern Power System Analysis,* DP Kothari, I.J.Nagrath, Mc Graw Hill

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE304B CONVENTIONAL AND CAD OF ELECTRICAL MACHINES
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VI

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

GENERAL & BASIC DESIGN PRINCIPLES: General features and limitations of electrical machine design. Types of enclosures, heat dissipation, temperature rise heating and cooling cycles and ratings of machine machines. Cooling media used. Output equation and output coefficient, Specific electric and magnetic loading. Effect of size and ventilation.

UNIT-II

MAGNETIC CIRCUITS: MMF calculation for air gun and iron parts of electrical machines, gap contraction coefficient. Real and apparent flux densities. Estimation of magnet current of transformers and rotating machines, no load current of transformers and induction motors. Leakage flux and reactance calculations for transformers and rotating machines, Design of field magnet.

UNIT-III

DETAILED DESIGN: Design of transformer, D.C. machines, induction motor and synchronous machine and their performance calculations.

UNIT-IV

COMPUTER AIDED DESIGN: Computerization of design Procedures. Development of Computer program and performance prediction. Optimization techniques and their applications to design Problems.

TEXT BOOK:

1. A course in Electrical Machine Design by A.K. Sawhney, Dhanpat Rai Pub.
2. Electrical Machines: Smarajit Ghosh, Pearson

REFERENCE BOOKS:

1. Theory, performance and Design of alternating current machines by M.G. Say, ELBS, 15th Ed. 1986.
2. Theory, Performance and Design of Direct Current machines by A.E. Clayton, 3rd Ed. 1967.
3. Optimization Techniques, S.S. Rao
4. Electrical Machines, Drives and Power Systems: Theodore Wildi, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE306B ADVANCED MICROPROCESSOR & MICROCONTROLLER
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VI

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Introduction to 8086 microprocessor, RISC and SISC processors, architecture and pin diagram of 8086 and description of various signals. Register organization of 8086; Description of address computations & memory segmentation; Segment override, Instruction pipelining, Timing diagrams, Addressing modes.

UNIT-II

Instruction set of 8086, Instruction execution timing, Instruction format, Data transfer instructions, Arithmetic instructions, Branch instructions, Loop instructions, NOP & HLT instructions, Flag manipulation instructions, Logical instructions, Shift & Rotate instructions, Directives & operators, Interrupts of 8086,Assembly language Programs using 8086.

UNIT-III

The concept of microcontroller, comparison between Microcontrollers & Microprocessors. Architecture and Pin diagram of 8051 microcontroller, Memory organization. Special function registers. External memory, Reset operation. Instruction Set, Addressing modes, arithmetic, Logical. Data transfer. Boolean variable manipulation, program branching instructions etc. Programs based on various instructions.

UNIT-IV

Timer operation, Timer Mode register, Timer Control register. Timer modes & overflow flag, Starting, Stopping & controlling the timers. Programs for generating square waves of various frequencies. Serial port operation, UART,Serial port control register, Modes of serial port operation. Serial port baud rate. . Initialization & programming of serial port. Interrupts of 8051, SFRs related to interrupts, processing interrupts, program design using interrupts. Interfacing with LED, DC motors, stepper motors.

TEXT BOOKS:

1. M.A.Mazidi, J.G.Mazidi, and R.D.Mckinlay,"The 8051 Microcontroller and embedded systems," Pearson.
2. Yu-Chang Liu & Glenn A Gibson, "Microcomputer Systems: The 8086/ 8088 Family: Architecture, Programming & Design," PHI.
3. Badri Ram, " Advanced Microprocessors and Interfacing," Tata McGraw Hill.
4. Subrata Ghoshal, " 8051 Microcontroller," Pearson.
5. Microprocessors and Microcontrollers : N.Senthil Kumar M.Saravanan S.Jeevananthan, Oxford university press.
6. MicroProcessor Comprehensive Studies : Naresh Grover, Dhanpat Rai

REFERENCE BOOKS:

1. Brey and Sharma, "The Intel Microprocessors: Architecture,Programming & Interfacing,"Pearson
2. D.V. Hall, "Microprocessors and Interfacing: Programming & Hardware," TMH.

3. Kenneth J. Ayala, "The 8051 Microcontroller: Architecture, programming & Applications", Penram International Publishers.
4. Myke Predko, "Programming and Customizing the 8051 Microcontroller," Tata McGraw Hill.
5. Daniel Tabak, "Advanced Microprocessors," Tata McGraw Hill.
6. Uffenbeck, "8086/8088 Family: The Design, Programming and Interfacing," PHI.
7. I Scott Mackenzie and Raphael C. W. Phan, " The 8051 Microcontroller," Pearson
8. Ajoy Kumar Ray and K. M. Bhurchandi, " Advanced Microprocessors and Peripherals," TMH. .
9. Microprocessors & Microcontrollers : Soumitra Kumar Mandal, Mc Graw Hill
10. Advanced Microprocessors and Peripherals : A.K.Rai, K.M.Bhurchandi, Mc Graw Hill
11. A.Nagoor Kani, "8086 microprocessor and its applications", TMH

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

ECE312B COMMUNICATION SYSTEMS & TECHNOLOGY
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VI

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

SECTION-I

UNIT 1- INTRODUCTION TO COMMUNICATION SYSTEM:
Modulation, Demodulation, Radio Frequency Spectrum, Signals & their classification, Limitations & Advantages of a Communication System, Comparison of Analog & Digital Communication Systems, Historical Perspective, Modes & Medias of Communication

UNIT 2- NOISE:Sources of Noise, External & Internal Noise, Noise Calculations, Noise Figure, Noise Figure Calculation, Noise Temperature, Noise in Communication Systems, Band Pass Noise Model, Cascaded States & its Noise Figure Calculation, Signal in presence of Noise, Pre-Emphasis & De-Emphasis, Noise Quieting Effect, Capture Effect, Noise in Modulation Systems.

SECTION-II

UNIT 3- LINEAR MODULATION:
(AM) Basic definition & derivation for Modulation & Modulation Index, Modulation & Demodulation of AM, Suppressed Carrier Modulation, Quadrature Amplitude Modulation, SSB-SC, DSB-SC, VSB Modulation & Demodulation, Comparison of various AM Systems, Generation of AM waves.

UNIT 4 - ANGLE MODULATION:
Basic definition & derivation for Modulation & Modulation Index, Generation of FM waves, Comparison between PM & FM, Frequency Spectrum of FM, B.W. & required spectra, Types of FM, vector representation of FM, Universal Curve, Multiple FM, Demodulation of FM waves, Demodulation of PM waves, Comparison between AM & FM.

SECTION-III

UNIT 5 - PULSE ANALOG MODULATION:
Sampling theory, TDM, FDM, PAM, PWM, PPM, Modulation & Demodulation techniques of above all.

UNIT 6- PULSE DIGITAL MODULATION:
Elements of Pulse Code Modulation, Noise in PCM Systems, Bandwidth of PCM Systems, Measure of Information, Channel Capacity, Channel Capacity of PCM System, Differential Pulse Code Modulation (DPCM). Delta Modulation (DM), Digital Modulation-ASK, FSK, PSK, DPSK

SECTION-IV

UNIT 7 Microwave communications: Transmit & receive antennas, link budget, line of sight systems, Satellite-link-GT ratio of earth stations, VSATS & GPSS.

UNIT 8 OPTICAL COMMUNICATION SYSTEMS: Types of optical fibres - step, index & graded index, multi mode & single mode, attenuation & dispersion in fibres, Optical transmitters LEDS & laser Diode, Optical Receivers-PIN & APDS, optical fiber link.

REFERENCE BOOKS:

1.	Communication Systems,	By Manoj Duhan – I. K. International
2.	Electronic Communication Systems	By Kennedy – TMH
3.	Communication Systems,	By Singh & Sapre - TMH

4.	Electronic Communication,	By Roody Coolen – Pearson
5	.Analog Communication,	By P. Chakarbarti – DR & Co.
6.	Communication Systems,	By Simon Haykins – Wiley

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each section. The candidates will be required to attempt five questions in all selecting at least one from each section. All questions will carry equal marks.

EE308B ELECTRIC POWER GENERATION
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VI

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Energy sources, their availability, Recent trends in Power Generation, Interconnected Generation of Power Plants, Load forecasting, load curves, load duration curve, Base load and Peak load Power Plants, connected Load, maximum demand, demand factor, Group diversity factor, load factor, significance of load factor, plant factor, capacity factor, selection of unit size, No. of Units, reserves, cost of power generation, Depreciation, tariff

UNIT-II

CONVENTIONAL ENERGY SOURCES-I: Selection of site, capacity calculations, classification, advantages, disadvantages, Schematic diagram and working of Thermal Power Stations & Nuclear Power Plant

UNIT-III

CONVENTIONAL ENERGY SOURCES-II: Selection of site, capacity calculations, classification, advantages, disadvantages, Schematic diagram and working of Hydro Electric Plant and Diesel Power Stations.

UNIT-IV

NON-CONVENTIONAL ENERGY SOURCES: Wind, Solar, Tidal, Ocean, and Geothermal sources of Energy, fuel cell, Magneto Hydro Dynamic (MHD) system.

TEXT BOOKS:

1. Electric Power Generation, B.R.Gupta
2. Power Generation, Operation and Control, Wood and Wollenberg, John Wiley & Sons,1984.
3.

REFERENCE BOOKS:

1. A Course in Electric Power System, Soni, Gupta, Bhatnagar, Dhanpat Rai & Sons
2. Power System Engineering, Nagrath & Kothari, Tata Mc-Graw Hill, New Delhi
3. Power Plant Engg: G.D. Rai
4. Electric Power: S.L. Uppal (Khanna Publishing)
5. *Electric Power Distribution and Transmission*, Luces M.Faulkenberry Walter Coffer, Pearson
6. *Generation and Utilization of Electrical Energy*, S.Sivanagaraju M.Balasubba Reddy D.Srilatha, Pearson

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal mark

EE310B EMBEDDED SYSTEMS & APPLICATIONS
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VI

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Different types of microcontrollers: Embedded microcontrollers, External memory microcontrollers; Processor Architectures: Harvard V/ S Princeton, CISC V/ S RISC; microcontrollers memory types; microcontrollers features: clocking, i/ o pins, interrupts, timers, peripherals. Introduction to PIC microcontrollers, Architecture and pipelining, program memory considerations,

UNIT-II

INTERRUPTS AND I/O PORTS: Addressing modes, CPU registers, Instruction set, simple operations, Interrupt logic, Timer 2 scalar initialization, IntService Interrupt service routine, loop time subroutine, External interrupts and timers, Synchronous serial port module, Serial pheriphal device, O/p port Expansion, I/p port expansion, UART.

UNIT-III

SOFTWARE: Development tools/ environments, Assembly language programming style, Interpreters, High level languages, Intel hex format object files, Debugging. Arithmetic operations, Bit addressing, Loop control, Stack operation, Subroutines, RAM direct addressing, state machines, Oscillators, Timer Interrupts, Memory mapped I/O.

UNIT-IV

INTERFACING WITH 8051: Interfacing an LCD to the 8051, 8051 interfacing to ADC, Sensors, Interfacing a Stepper Motor, 8051 interfacing to the keyboard, Interfacing a DAC to the 8051, 8255 Interfacing with 8031/51, 8051/31 interfacing to external memory

DESINING USING MICROCONTROLLERS: Music box, Mouse wheel turning, PWM motor control, Aircraft Demonstration, ultra sonic distance measuring, Temperature Sensor, Pressure Sensor, Magnetic field Sensor.

TEXT BOOK:

1. Design with PIC Microcontrollers by John B. Peatman, Pearson.
2. Application-Specific Integrated Circuits : Michael John Sebastian Smith, pearson

REFERENCE BOOKS:

1. Programming and Customizing the 8051 Microcontroller: Predko; TMH.
2. Designing Embedded Hardware: John Catsoulis; Shroff Pub. & Distr. ND.
3. Programming Embedded Systems in C and C++: Michael Barr; Shroff Pub. & Distr. ND.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE322B POWER SYSTEMS LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VI

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. To draw the operating characteristics of IDMT over current relay.
2. To draw the operating characteristics of IDMT under Voltage relay.
3. To draw the operating characteristics of IDMT over Voltage relay.
4. To draw the operating characteristics of Differential current relay.
5. To draw the operating characteristics of negative sequence relay.
6. To study 33KV substation.
7. Single line diagram of electrical power flow of campus.
8. To study and designing of Earthing / Grounding.
9. Study the burden effect on the performance of CT and measure ratio error.
10. Find out the sequence components of currents in three 1-Phase transformers and 3-Phase transformer and compare their results.
11. (i) Study over current relay.
    (ii) Draw the current-time characteristic of an over current relay for TMS=1 & 0.5and PSM=1.25 & 1.0.
12. (i) Study percentage bias differential relay.
    (ii) Plot the characteristics of a percentage bias differential relay for 20%, 30% and 40% biasing.
13. To perform gas actuated Buchholz relay.
14. Design and simulation of HV transmission line .
15. Study filtration and Treatment of transformer oil.
16. Determine dielectric strength of transformer oil.

NOTE:

1. The students will be required to perform the 8 experiments/exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

ECE332B COMMUNICATION SYSTEMS & TECHNOLOGY LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER - VI

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. To study and analyze various waveform of Digital modulation.
2. To study different types of Filters.
3. To study Amplitude Shift Keying (ASK) modulation.
4. To study Frequency Shift Keying (FSK) modulation.
5. To study Phase Shift Keying (PSK) modulation.
6. To study Time Division Multiplexing (TDM).
7. To study Frequency Division Multiplexing (FDM).
8. To study Binary Phase Shift Keying (BPSK) modulation.
9. To study Phase Locked Loop (PLL).
10. To study Pulse amplitude modulation and demodulation.
11. To study Pulse width Modulation(PWM).
12. To study Pulse Position Modulation(PPM)
13. To deliver seminar by each student on advance communication system

Note:-

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

324B CONVENTIONAL AND CAD OF ELECTRIC MACHINES LAB
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VI

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

Draw a flow chart & write a program (using a high level language such as C / C++ / MATLAB, etc.) for:

1. Yoke design of a transformer.
2. L.V. & H.V. windings design of a transformer.
3. Calculation of losses & efficiency of a transformer.
4. Stator design of an induction motor.
5. Rotor design of an induction motor.
6. Calculation of losses & efficiency of an induction motor.
7. Stator design of a synchronous machine.
8. Rotor design of a synchronous machine.
9. Calculation of losses & efficiency of a synchronous machine.
10. Armature winding & field winding design of a D.C. motor.
11. Armature core design of a D.C. motor.
12. Calculation of losses & efficiency of a D.C. motor.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE326B ADVANCED MICROPROCESSOR & MICROCONTROLLER LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VI

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

(A) 8086 Microprocessor:

1. Write a well-documented program for copying 12 bytes from source to destination, on 8086 microprocessor kit.
2. Write a program for 8086 for division of a defined double word (stored in a data segment) by another double word and verify.
3. Write a well-documented program for finding the square root of a given number, on 8086, microprocessor kit.
4. Write a program using 8086 for finding the square of a given number and verify.
5. Write a program using 8086 and verify for:
   (i) Finding the largest number from an array.
   (ii) Finding the smallest number from an array.
6. (i)Write a program using 8086 for arranging an array of numbers in descending order and verify.
   (ii)Write a program using 8086 for arranging an array of numbers in ascending order and verify.
7. Write a program for 8086 for finding square of a number using look-up table and verify.
8. Write a program to control the operation of stepper motor using 8086 microprocessor and 8255 chip.
9. Write a program using 8086 to add a series of 16-bit numbers.

(B) 8051 Microcontroller:

10. To study the architecture of 8051 microcontroller.
11. Write a program in 8051 to add and subtract two 8 bit numbers.
12. Write an ALP to generate square wave of 10 kHz frequency using timer of 8051 microcontroller.
13. To find average of Ten 8-bit numbers.
14. Write an ALP to interface LED and switches with 8051 microcontroller.
15. Write a program to find (i) largest number and (ii) smallest number from an array using 8051 microcontroller.
16. Write a program to generate square wave of 50 Hz frequency using timer of 8051 microcontroller.
17. To control the operation of DC motor using 8051 microcontroller.
18. To interface LCD with 8051 microcontroller.
19. To control the operation of stepper motor using 8051 microcontroller.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course

2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

REPORT WRITING SKILLS
HUM- 302 B
B.TECH. (ELECTRICAL ENGINEERING)
Semester – VI (Common for all branches)

L	T	P	Credits
1	-	-	1

Internal Marks: 25
External Marks: 50
Total: 75 Marks
Duration of Examination: 2 Hours

OBJECTIVE
The course aims at developing competence for report writing with a focus on its complex writing techniques and procedures.

COURSE CONTENT

UNIT I

Report Writing
Reports: meaning, their importance and types, Structure of reports, Formats of reports, Use of illustrations

UNIT II

Writing of Business and Technical Reports:
Preliminary steps and procedure of writing report, writing various types of reports on technical, business related topics

RECOMMENDED READING

a. Borowick, Jerome. N. *Technical Communication and its Applications*. New Delhi: PHI, 2000
b. Guffey, Mary Ellen. *Business Communication: Process & Product*. USA: South western College Publishing, 2000.
c. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST) AND INSTRUCTIONS FOR THE EXAMINER

1. The duration of the exam will be 2 hours.
2. The Question Paper for this theory course shall have three questions in all covering both the units. All will be compulsory with internal choice.
3 Question no. 1 will be of 10 marks. The question may have two/three parts with enough internal choice, covering various components of both the Units.
4. Question no 2 with internal choice will be of 10 marks covering contents of the Unit I. It will be theoretical in nature.
5. Question no 3 will have two parts of 15 marks each. The student will be asked to write reports on business and technical subject/ issue covering contents of Unit II. The emphasis would be on testing the actual report writing on a given business and technical situation/ subject in letter format.

Oral Presentation Skills
HUM- 304 B
B.TECH. (ELECTRICAL ENGINEERING)
Semester – VI (Common for all branches)

L	T	P	Credits
-	-	2	1

Internal Marks: 20
External Marks: 30
Total: 50 Marks
Duration of Examination: 2 Hours

OBJECTIVE
To enable students to develop their speaking skills with professional proficiency

COURSE CONTENT

Oral Presentations:

Group Discussion; Mock interviews

Note for the Teacher:

The teacher concerned, by devising her/his method, must preview and review the student's spoken proficiency at the beginning and end of the semester respectively to find the efficacy of the course and degree of improvement in the student.

RECOMMENDED READING

a. Konar, Nira. *English Language Laboratories: A Comprehensive Manual*. Delhi: PHI, 2011
b. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

SCHEME OF END SEMESTER EXAMINATION (Practical)

An external Practical exam of 25 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the university's Controller of Exams.

NOTE: **Students will be tested for their oral communication competence making them participate in Group discussion, mock situations for interview. Students may also be evaluated through a viva conducted by an external examiner.**

GPEE 302B GENERAL PROFICIENCY & ETHICS							
B. Tech. Semester – VI (Electrical Engineering)							
L	**T**	**P**	**Credits**		**Examination**	**:**	**75Marks**
1	**--**	**--**	**2**		**Total**	**:**	**75 Marks**

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him / her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

B. The student will present a written report before the committee with following in view:

The student will present before the committee his/ her achievements during the current academic session in the form of a written report highlighting followings:

I.	Academic Performance	--------
II.	Extra Curricular Activities / Community Service, Hostel Activities	**(8 Marks)**
III	Technical Activities / Industrial, Educational tour	**(8 Marks)**
IV	Sports/games	**(14 Marks)**
V	Moral values & Ethics	**(15 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

D. A student will support his/ her achievement and verbal & communicative skill through presentation before the committee. **(30 Marks)**

C. Moral values & Ethics

Syllabus - A few topics from the below mentioned books

1. R.R.Gaur, R. Sangal and G.P. Bagaria, " Bagaria, " A foundation course in Human Values and Professional Ethics", Pub: Excel Books, New Delhi-110028.
2. M. Govindrajan, S Natrajan & V.S. Senthil Kumar, " Engineering Ethics (including Human Values)" Eastern Economy Edition, Prentics Hall of India Ltd.

A minor test/ Quiz will be conducted during the semesterand It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1	Chairperson of the Department	Chairman
2	Senior Most Faculty Counselor	Member
3	Vice- Chancellor's Nominee	Member

Affiliated Colleges:

1	Director/Principal	Chairman
2	Head of the Department/Sr. Faculty	Member
3	External Examiner to be appointed by the University	Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

EE401B SENSORS AND TRANSDUCERS
B.TECH. (ELECTRICAL ENGINEERING)COMMON WITH AEI IN 5TH SEM.
SEMESTER-VII

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

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UNIT I

Basic concepts of sensors and transducers and their classification, characteristics and choice of transducers, factors influencing the choice of transducers. Resistive transducers, potentiometers, loading effect, construction of potentiometers, materials used for potentiometers.

Strain gauges, theory of strain gauges, types of strain gauges, semiconductor strain gauges, Rossetts, Load cells. Thermistors, thermometers, thermocouples and their applications.

UNIT II

Variable inductance transducers, Linear Variable Differential Transformer(LVDT), Rotary Variable Differential Transformer(RVDT), Synchros, control type synchro systems, synchros as torque transmitters.

Capacitive transducers, transducers using change in area of plates, transducers using change in distance between plates, differential arrangement, variation of dielectric constant for measurement of displacement and liquid level, frequency response of capacitive transducers. Piezoelectric transducers, modes of operation of piezoelectric crystals, properties of piezoelectric crystals, equivalent circuit of piezoelectric transducers, loading effects and frequency response, impulse response of piezoelectric crystals.

UNIT III

Hall Effect transducers, photovoltaic cells, photoconductive cells, semiconductor photodiode, phototransistors. Measurement of angular velocity, Electrical tachometers, Electromagnetic tachometer generators, Digital methods, Photoelectric tachometers, stroboscope and stroboscopic methods,

Measurement of low pressure using various methods, Measurement of acceleration, flow liquid level and humidity employing different transducers.

UNIT IV

Chemical sensors, measurement of pH values, measurement of thermal conductivity.

Data acquisition in instrumentation systems, various types of data acquisition systems, method of data transmission, general telemetry system, types of telemetry systems, Landline telemetry and Radio Frequency(R.F.) telemetry.

Recent trends in sensor technology, smart sensors, basic building blocks of smart sensors, application of smart sensors.

TEXT BOOKS:

1. A.K.Sawhney, "A Course in Electrical and Electronics Measurement and Instrumentation,"Dhanpat Rai & Co.
2. D.V.S.Murti, " Transducers and Instrumentation," PHI.
3. D.Patranabis, " Principles of Electronic Instrumentation," PHI
4. Electronic Instrumentation and Measurements : David A.Bell , Oxford University press.

5. Electronic Measurements and Instrumentation : K.Lal Kishore, Pearson

REFERENCE BOOKS:

1. D. Patranabis, "Sensors and Transducers," PHI.
2. D.A.Bell, "Electronic Instrumentation and Measurements, "PHI.
3. Rangan, Sharma and Mani, "Instrumentation Devices and Systems," TMH.
4. Elements of Electronic Instrumentation and Measurement: Joseph J.Carr, pearson

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE403B ELECTRIC DRIVES
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VII

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

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UNIT-I

Electrical Drives: Introduction, advantages, choice of electrical drives, status of ac and dc drives.
Dynamics of Electrical Drives: Fundamental torque equations, multi-quadrant operation, equivalent values of drive parameters, load torque components, types of loads, steady state stability, load equalization.
Control of Electrical Drives: Modes of operation, closed loop control of drives, sensing of current and speed.

UNIT-II

DC Motor Drives: Speed-torque characteristics of different types of dc motors, starting, types of braking, transient analysis, speed control methods, static control of dc motors. Converter fed dc drive & chopper fed dc drive.

UNIT-III

Induction motor Drives: Characteristics, analysis and performance, starting methods, braking methods, transient analysis, methods of speed control, vector control. Static control techniques- stator frequency control, stator voltage control, rotor resistance control. Static Scherbius system & static Kramer system.

UNIT-IV

Selection of motor power rating: Heating and cooling, determination of motor rating, continuous, short time and intermittent duties, determination of moment of inertia of the flywheel.
Traction Drives: Nature of traction load, important features of traction drives, static control of traction drives; comparison between ac and dc tractions.

TEXT BOOKS:

1. Fundamentals of Electrical Drives, G.K.Dubey, Narosa Publishing House

REFERENCE BOOKS:

1. Power Semiconductor controlled drives, G.K.Dubey, Prentice Hall.
2. Electric Drives: V.Subrahmaniyam TMH
3. Electric Drives: Leonard, Narosa Pub.
4. Electric Drives: Diwan
5. Power Electonics : M.D.Singh, K.B.Knanchandani : Mc Graw Hill

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE405B DIGITAL SIGNAL & IMAGE PROCESSING
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VII

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

SIGNALS AND SIGNAL PROCESSING: characterization & classification of signals, typical Signal Processing operations, example of typical Signals, typical Signals Processing applications, discrete time random signals. Discrete Time Signals, Operations on Sequences, the sampling process, Discrete-Time systems, Time-Domain characterization of LTI Discrete-Time systems, Correlation of signals.

UNIT-II

TRANSFORM-DOMAIN REPRESENTATION OF SIGNALS: Discrete-Time Fourier Transform, Discrete Fourier Transform, DFT properties, computation of the DFT of real sequences, Linear Convolution using the DFT. FFT Algorithms.

DIGITAL PROCESSING OF CONTINUOUS-TIME SIGNALS: Sampling of Continuous Signals, Analog Filter Design, Anti-aliasing Filter Design, Sample-and-hold circuits, A/ D & D/ A converter, Reconstruction Filter Design.

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UNIT-III

DIGITAL FILTER STRUCTURE: Block Diagram representation, Signal Flow Graph Representation, Equivalent Structures, FIR Digital Filter Structures, IIR Filter Structures, Parallel all pass realization of IIR transfer function, Digital Sine-Cosine generator.

DIGITAL FILTER DESIGN: Impulse invariance method of IIR filter design, Bilinear Transform method of IIR Filter Design, Design of Digital IIR notch filters, FIR filter Design based on truncated fonner sens, FIR filter design based on Frequency Sampling approach. Applications of DSP.

UNIT-IV

MULTIRATE DIGITAL SIGNAL PROCESSING: Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

DIGITAL IMAGE PROCESSING: Digital Image Representation, Fundamental Steps in Image Processing, Elements of Digital image processing systems.

TEXT BOOKS:

1. Digital Signal Processing : Proakis and Manolakis; PHI Pub.
2. Allan Y. Oppenhein & Ronald W. Schater , "Digital Signal Processing", PHI, 2004.

REFERENCE

3. Digital Signal Processing, Amberdar, Cengage Publishers
4. Digital Signal Processing : Salivahanan & Gnanapriya; TMH Pub.

REFERENCE BOOKS:

1. J. R. Jhohnson, "Intorduction to Digital Signal Processing", PHI, 2000.
2. B. Somanthan Nair, "Digital Signal Processing: Theory, Analysis & Digital Filter Design", PHI, 2004
3. Sanjit K. Mitra, "DSP a Computer based approach" , TMH, 2nd Ed., 2001.
4. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", PHI, Second Edition, 2008.
5. C.-T. Chen, "Digital Signal Processing", Oxford, 2007.
6. S. Sridhar, "Digital Image Processing", Oxford, 2011.ws

7. Fundamentals of Speech Recognition: Lawrence Rabiner Biing-Hwang Juang B.Yegnanaryana, Pearson
8. Simon Haykin : Adaptive Filter Theory, Pearson.
9. Charles L.Phillips John Parr Eve Riskin: signal, Systems and Transforms, Pearson.
10.

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE407B POWER SYSTEM OPERATION AND CONTROL
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VII

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

AUTOMATIC GENERATION CONTROL: Single area load frequency control, load frequency Vs economic control, two area load frequency control, speed governor, dead band, digital load flow control, decentralized control, application to MATLAB.

UNIT-II

EXCITATION & VOLTAGE CONTROL: Exciters, boost buck excitation system, static excitation system, brushless excitation system, and development of excitation system and transfer function, first bench mark model.

UNIT-III

Power Systems Stability: Definitions: angular stability- steady state stability, dynamic stability, transient stability, mechanics of angular momentum, swing equation, equal area criteria, critical clearing angle, solution of swing equation, stability study in multi-machine system, application of MATLAB, technique of improving transient stability, Voltage stability, Voltage collapse, V-P and V-Q curves.

UNIT-IV

ECONOMIC LOAD DISPATCH: Generation operation cost, Economic dispatch problem, Economic Dispatch including transmission loss, derivation of transmission loss formula.

TEXT BOOKS:

1. Power Systems Engineering by S K Gupta, Umesh Publication, New Delhi
2. Power system analysis by O I Elgerd: TMH Publication New Delhi
3. Modern Power System by Nagrath Kothari: TMH Publication New Delhi
4. Power system analysis and Stability by S S Vadhera: Khanna Publication New Delhi
5. Power system analysis by Hadi Sadat: TMH Publication, New Delhi
6. Power System Dynamics & Stability by Sauer and M A Pai: Person Education
7. Power System Stability and Control: Parbha Kundur, Mc Graw Hill.

REFERENCE BOOKS:

1. Power System Operation and Control by S Sivanagaraju & G Sreenivasan: PEARSON EDUCATION
2. Advanced Power System Analysis & Dynamics by L P Singh: Wiley Eastern LTD New Delhi
3. Elements of Power System Analysis by W D Stevenson: MGH Publication New Delhi
4. Power System Dynamics by M A Pai: Prentice Hall New Delhi
5. Dynamic control of Large Electric Power Systems by ILIC: Tbi pub,
6. Power Generation, operation and control by Alen J. Wood by Wiley.
7. Power System Analysis: T.K.Nagsarkar M.S.Sukjija, Oxford University Press

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

E423B ELECTRIC DRIVES LAB

B.TECH. (ELECTRICAL ENGINEERING), EEE, IC

SEMESTER-VII

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. Speed control of dc motor using dc chopper.
2. Speed control of dc motor using single-phase converter.
3. Speed control of dc motor using 3-phase converter.
4. Speed control of dc motor using single- phase dual converter.
5. Inverter fed single-phase induction motor drive.
6. CSI fed induction motor drive.
7. Speed control of single- phase induction motor using ac regulator.
8. Regenerative braking of dc motor using single- phase converter.
9. Speed control of single-phase induction motor using cycloconverter.
10. Static rotor resistance control method.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE425B DIGITAL SIGNAL & IMAGE PROCESSING LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE, IC
SEMESTER-VII (COMMON TO EE, EL)

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

Perform the following experiments using MATLAB:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter (low-pass, high pass, band-pass, band-stop).
7. To design digital IIR filters (low-pass, high pass, band-pass, band-stop).
8. To design FIR filters using windows technique.
9. To design a program to compare direct realization values of IIR digital filter
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter
12. To develop a program for computing inverse Z-transform of a rational transfer function.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE415B PROJECT
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VII

L	T	P		
-	-	4	Class-work Marks	: 100
			Total Marks	: 100
			Credits	: 04

The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Engineering & Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.

Project involving design/ fabrication/ testing/ computer simulation/ case studies,etc. which commences in the VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairman of Department/HOD	: Chairperson
Project coordinator	: Member Secretary
Respective project supervisor	: Member

The student will be required to submit two copies of his / her project report to the department for record (one copy each for the department and one for participating teacher).

Project coordinator will be assigned the project load of maximum of 2 hrs. per week including his/her own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students / groups under him / her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

EE433B PROFESSIONAL TRAINING – II
B.TECH. (ELECTRICAL ENGINEERING)
B.TECH. SEMESTER-VII

L	T	P
-	-	2

Class-work Marks	: 50
Total Marks	: 50
Credits	: 02

At the end of 6th semester, each student would undergo four weeks Professional Training in an Industry / Institute / Professional / Organization / Research Laboratory etc. with the prior approval of the Training and Placement Officer of the University and submit in the department a typed report along with a certificate from the organization.

The typed report should be in a prescribed format.

The report will be evaluated in the VII Semester by a Committee consisting of two to three teachers from different specializations to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the knowledge and exposure of the student towards different processes and the functioning of the organization.

The student will interact with the committee through presentation to demonstrate his / her learning.

Teachers associated with the evaluation work will each be assigned 2 periods per week load.

OPEN ELECTIVES:

B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VII

MEI 623B ENTREPRENEURSHIP							
B. Tech. Semester – VII - Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

ENTREPRENEURIAL DEVELOPMENT PERSPECTIVE: Concepts of Entrepreneurship Development, Evolution of the concept of Entrepreneur, Entrepreneur Vs. Intrapreneur, Entrepreneur Vs. Entrepreneurship, Entrepreneur Vs.Manager, Attributes and Characteristics of a successful Entrepreneur, Role of Entrepreneur in Indian economy and developing economies with reference to Self-Employment Development, Entrepreneurial Culture

UNIT II

CREATING ENTREPRENEURIAL VENTURE: Business Planning Process, Environmental Analysis - Search and Scanning, Identifying problems and opportunities, Defining Business Idea, Basic Government Procedures to be complied with.

UNIT III

ENTREPRENEURSHIP DEVELOPMENT AND GOVERNMENT: Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available; Role of Central/State agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB).

UNIT IV

PROJECT MANAGEMENT AND CASE STUDIES

Technical, Financial, Marketing, Personnel and Management Feasibility, Estimating and Financing funds requirement - Schemes offered by various commercial banks and financial institutions like IDBI, ICICI, SIDBI, SFCs, Venture Capital Funding, Why do Entrepreneurs fail - The Four Entrepreneurial Pitfalls (Peter Drucker), Case studies of Successful Entrepreneurial Ventures, Failed Entrepreneurial Ventures and Turnaround Ventures.

Texts and References:

1. Entrepreneurship: New Venture Creation - David H. Holt.
2. Entrepreneurship - Hisrich Peters.
3. The Culture of Entrepreneurship - Brigitte Berger.
4. Project Management - K. Nagarajan.
5. Dynamics of Entrepreneurship Development - Vasant Desai.
6. Entrepreneurship Development - Dr. P.C.Shejwalkar.
7. Thought Leaders - Shrinivas Pandit.
8. Entrepreneurship, 3rd Ed. - Steven Brandt.
9. Business Gurus Speak - S.N.Char.
10. The Entrepreneurial Connection - Gurmit Narula.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

BME 451B MEDICAL INSTRUMENTATIONS							
B. Tech. Semester – VII – Open Elective							
L	T	P	Credits		Class Work	:	25 Marks
4	-	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT-I

PHYSIOLOGY AND TRANSDUCERS: Cell and its structure – Action and resting – Potential propagation of action potential – Sodium pump – Nervous system – CNS – PNS – Nerve cell – Synapse – Cardio pulmonary system – Physiology of heart and lungs – Circulation and respiration – Transducers – Different types – Piezo-electric, ultrasonic, resistive, capacitive, inductive transducers – Selection criteria.

UNIT-II

ELECTRO – PHYSIOLOGICAL AND NON-ELECTRICAL PARAMETER MEASUREMENTS: Basic components of a biomedical system – Electrodes – Micro, needle and surface electrodes – Amplifiers – Preamplifiers, differential amplifiers, chopper amplifiers – Isolation amplifier. ECG – EEG – EMG – ERG – Lead systems and recording methods – Typical waveforms. Measurement of blood pressure – Cardiac output – Cardiac rate – Heart sound – Respiratory rate – Gas volume – Flow rate of CO_2, O_2 in exhaust air - PH of blood, ESR, GSR measurements – Plethysmography.

UNIT-III

MEDICAL IMAGING AND PATIENT MONITORING SYSTEMS: X-ray machine - Radio graphic and fluoroscopic techniques – Computer tomography – MRI – Ultrasonography – Endoscopy – Thermography – Different types of biotelemetry systems and patient monitoring – Electrical safety. Biological effects of X-rays and precautions.

UNIT-IV

ASSISTING AND THERAPEUTIC EQUIPMENTS: Pacemakers – Defibrillators – Ventilators – Nerve and muscle stimulators – Diathermy – Heart – Lung machine – Audio meters – Dialyzers. Respiratory Instrumentation - Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

TEXT BOOKS

1. Biomedical Instrumentation and Measurements – Leslie Cromwell and F.J. Weibell, E.A. Pfeiffer, PHI, 2nd Ed, 1980.
2. Medical Instrumentation, Application and Design – John G. Webster, John Wiley, 3rd Ed., 1998.

REFERENCE BOOKS

1. Principles of Applied Biomedical Instrumentation – L.A.Geoddes and L.E. Baker, John Wiley, 1975.
2. Hand-book of Biomedical Instrumentation – R.S. Khandpur, TMH, 2nd Ed., 2003.
3. Biomedical Telemetry – Mackay, Stuart R., John Wiley, 1

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

ECE 305B CONSUMER ELECTRONICS							
B. Tech. Semester – VII – Open Elective							
L	T	P	Credits		Class Work	:	25 Marks
4	-	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT I

MONOCHROME TV (INTRODUCTION): Elements of a TV System,Picture transmission,Sound transmission,Picture reception,Sound reception,Synchronization,Receiver control,Image continuity, Scanning Process, Aspect Ratio, Flicker, Composite Video Signal, Picture Elements,Kell factor, Vertical Resolution,Horizontal Resolution,Video bandwidth,Interlacing, 625 Line System,Bandwidths for TV Transmission,Vertical and horizontal synch detail,Vestigial Side Band transmission(Advantages and Disadvantages)

MONOCHROME TV (PICTURE AND CAMERA TUBES): Monochrome picture tube,beam reflection,Beam focussing,Screen Phosphor,Face plate,Picture tube characteristics,picture tube circuit controls,Monochrome Camera Tubes:Basic principle,Image Orthicon, Vidicon,Plumbicon

UNIT II

COLOUR TV ESSENTIALS: Compatibility , Colour perception,Three Colour theory,Luminance,Hue and Saturation, Dispersion and Recombination of light,Primary and secondary colours,luminance signal,Chrominance Signal, Colour picture tube,colour TV Camera,Colout TV display Tubes,colour Signal Transmission,Bandwidth for colour signal transmission,Colour TV controls. Cable TV,Block Diagram and principle of working of cable TV.

PLASMA AND LCD: Introduction,liquid crystals,types of LCD's,TN,STN,TFT,Power requirements,LCD working,Principle of operation of TN display,Construction of TN display,Behaviour of TN liquid crystals,Viewing angle,colour balance, colour TN display, limitatons, advantages, disadvantages, applications.

UNIT III

LED AND DMD : Introduction to LED Television , comparison with LCD and Plasma TV's, schematic of DMD, introduction to Digital MicroMirror device, Diagram of DMD, principle of working, emerging applications of DMD.

MICROWAVE OVENS AND AIR CONDITIONERS: Microwaves, Transit Time, Magnetron, Waveguides, Microwave Oven, Microwave Cooking. Air conditioning,Components of air conditioning systems,all water Air conditioning systems,all air air conditioning Systems,Split air conditioner.

UNIT IV

MICROPHONES: Introduction, characteristics of microphones,types of microphone:carbon,moving coil,wireless,crystal,introduction to tape recorder.

LOUDSPEAKER: Introduction to ideal and basic loudspeaker,loudspeaker construction types of loudspeaker: Dynamic and permanent magnet,woofers,tweeters,brief introduction to baffles,equalisers.

Text Books :

1.Consumer Electronics by S. P. Bali(Pearson Education)

2.Complete Satellite and Cable T.V by R.R Gulati(New Age International Publishers)

Reference Books:

1. Monochrome and Colour Television by R. R. Gulati

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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B.TECH. (ELECTRICAL ENGINEERING)

EE 451B ENERGY AUDIT							
B. Tech. Semester – VII – Open Elective							
L	T	P	Credits		Class Work	:	25 Marks
4	-	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT I

INTRODUCTION TO THE POWER DISTRIBUTION SYSTEM: Description of the power distribution system- voltage levels, Components of the distribution system- Substation, Transformer, feeders, distribution system planning, operation & maintenance objectives, activities involved in O&M, grid management, load scheduling & dispatch, load balancing, 66-33/ 11 KV substation equipment, 11/ 0.4 KV substation equipment, Distribution transformers-reasons for DT failures.

UNIT II

ENERGY ACCOUNTING & ENERGY AUDIT: Need for energy accounting, objectives & functions of energy accounting, Energy flow diagram in power distribution system, energy accounting procedure- Energy measurement, and problemsin energy accounting & overcoming these problems in energy accounting, Definition, need and types of energy audit, energy audit instruments,procedure for conducting an energy audit.

UNIT III

AT&C LOSS REDUCTION & EFFICIENCY IMPROVEMENT: Concepts and principles of distribution losses- transmission & distribution losses, AT&C losses in power distribution network, factors contributing to high technical & commercial losses. Technical loss reduction-Short term measures for technical loss reduction, long term plans for technical loss reduction, Commercial loss reduction- reasons for commercial losses, measures for commercial loss reduction.

UNIT IV

DEMAND SIDE MANAGEMENT: An introduction, Why DSM?, Benefits of DSM, DSM in power systems: load management, DSM techniques and emerging trends, EC Act 2001, DSM on consumer side – the industrial sector, the agricultural sector, the domestic & commercial sectors, ESCO-a route for DSM.

TEXT BOOKS:

1. Handbook of Energy Engineering, The Fairmont Press, INC.-Albert Thumann& Paul Mehta.
2. Energy Management Supply & Conservation, Butterworth Heinemann, 2002-dr. Clive Beggs.

REFERENCE BOOKS:

1. Hand book on energy audit & environment management by ISBN 81-1993.0920 TERI

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

EEE457B ENERGY RESOURCES & TECHNOLOGY							
B. Tech. Semester – VII – Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

ENERGY SOURCES & AVAILABILITY: World energy situation. Indian energy scenario. Comparative study of thermal, hydro, nuclear and gas power plants. Impact of thermal, gas, hydro and nuclear power stations on environment, air and water pollution, green house effect (global warning), Plasma confinement - magnetic confinement and inertial confinement, geothermal, hydrogen energy, fuel cells, Alkaline fuel cells (AFC), Solid oxide fuel cell (SOFC), Molten carbonate fuel cells (MCFC), thermo-electric power, MHD power generation OTEC & tidal waves.

UNIT-II

SOLAR ENERGY: Solar constant, solar radiation geometry, local solar time, day length, solar radiation measurement, radiation on inclined surface, solar radiation data & solar charts. Flat plate collectors , liquid and air type. Theory of flat plate collectors, advanced collectors, optical design of concentrators, selective coatings, solar water heating, solar dryers, solar stills, solar cooling and refrigeration. Thermal storage. Conversion of heat into mechanical energy. Active and passive heating of buildings. Solar cells.

UNIT-III

WIND ENERGY: Wind as a Source of Energy, Characteristics of wind, wind data. Horizontal & Vertical axis wind Mills, Wind Energy: Wind energy potential measurement, general theories of wind machines, basic laws and concepts of aerodynamics, wind mill and wind electric generator. Basic electric generation schemes- constant speed constant frequency, variable speed constant frequency and variable speed variable frequency schemes. Applications of wind energy.

UNIT-IV

BIOMASS ENERGY: Introduction to biomass, biofuels & their heat content, biomass conversion technologies. Aerobic & anaerobic digester, Factors affection biogestion, biogas plants - types & description. Utilisation of biogas - Gasifiers, direct thermal application of Gasifiers. Advantages & problems in development of Gasifiers, use in I.C. engines , Energy plantation. Pyrolysis scheme. Alternative liquid fuels –ethanol and methanol. Ethanol production.

TEXT BOOKS:

4. Electric Power Generation, B.R.Gupta
5. Power Generation, Operation and Control, Wood and Wollenberg, John Wiley & Sons,1984.
6. Power Plant Engg: G.D. Rai

REFERENCE BOOKS:

1. Renewable Energy Resources: John Twidell and Tony Weir
2. Renewable Energy Resources Conventional & Non- Conventional: M.V.R Koteswara Rao
3. Science & Technology of Photovoltaics: Jayarama Reddy P.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

BT401B BIO-INFORMATICS							
B. Tech. Semester – VII – Open Elective							
L	T	P	Credits		Class Work	:	25 Marks
4	-	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT-I

Introduction: Internet, intranet and extranet, networking, protocols, genomic data, organization, representation, data base management systems.

Sequencing Data Bank: Introduction, collecting and storing sequence in laboratory, nucleic acid data bank – Gen Bank, EMBL, AIDS and RNA, protein data bank (PDB), cambridge structural database CSD, genome data bank, hybridoma data bank structure and others.

UNIT-II

Sequence Analysis: Analysis tools for sequence data banks, pair wise alignment: NEEDLEMAN and WUNSCH algorithms, Smith Waterman, multiple alignment – CLUSTAL-W, BLAST, FASTA, sequence patterns and motifs and profiles.

Predictions: Secondary and tertiary structure: algorithms Chao-Fasman algorithm, hidden Markov model, neural networking, protein classification, fold libraries, fold recognition (threading), homology detection, SRS-access to biological data banks.

UNIT-III

Phylogenetic Analysis– Basic concepts in systematics, taxonomy and phylogeny, phylogenetic trees-various types and their construction, tree building methods, distance methods, multiple alignment character based method, phylogenetic software.

Managing Scientific Data: Introduction, challenges faced in integration of biological information, SRS, Kleisli Query System TAMBIS, P/ FDM mediator for a bioinformatics database, federation, discovery link and data management.

UNIT-IV

Genomics & Proteomics: Genome mapping, assembly and comparison, functional genomics: sequence based approaches & microarray based approaches, proteomics: technology of protein expression analylsis & posttranslational modifications, protein sorting, protein-protein interaction.

TEXT / REFERENCE BOOKS:

- Developing Bioinformatics Computer Skill, ed. Gibes & Jombeck, Shroff Publication
- Bioinformatics, ed. David W. Mount

Note: In the semester examination, the examiner will set 08 questions in all, selecting two from each unit. The candidates will be required to attempt five questions in all, selecting at least one from each unit. All questions will carry equal marks.

B.TECH. (ELECTRICAL ENGINEERING)

AE 417B MODERN VEHICLE TECHNOLOGY							
B. Tech. Semester – VII – Open Elective							
L	T	P	Credits		Class Work	:	25 Marks
4	-	--	4		Examination	:	75 Marks
					Total	:	100 Marks
					Duration of Examination	:	3 Hours

UNIT I

TRENDS IN POWER PLANTS: Hybrid vehicles – stratified charged / lean burn engines – Hydrogen engines – battery vehicles – Electric propulsion with cables – magnetic track vehicles.

UNIT II

SUSPENSION BRAKES AND SAFETY: Air suspension – Closed loop suspension – antiskid braking system, Retarders, Regenerative braking safety cage – air bags – crash resistance – passenger comfort

UNIT III

NOISE & POLLUTION: Reduction of noise – Internal & external pollution control through alternate fuels / power plants – Catalytic converters and filters for particulate emission.

UNIT IV

VEHICLE OPERATION AND CONTROL: Computer control for pollution and noise control and for fuel economy – Transducers and actuators – Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

VEHICLE AUTOMATED TRACKS: Preparation and maintenance of proper road network – National highway network with automated roads and vehicles – Satellite control of vehicle operation for safe and fast travel.

TEXT BOOKS

1. Heinz Heisler, "Advanced Vehicle Technology" - Arnold Publication.

REFERENCES

1. Beranek.L.L., Noise reduction, McGraw Hill Book Co., Inc., Newyork, 1993.
2. Bosch Hand Book, 3rd Edition, SAE, 1993.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

CE451B POLLUTION & CONTROL							
B. Tech. Semester – VII - Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT – I

WATER POLLUTION – Classification of water pollutants, water characteristics, effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

UNIT – II

AIR POLLUTION: Classification of air pollutants, Particulates: Physical characteristics, mode of formation, setting properties, Control measures.
HYDROCARBONS: Nature; sources, control, Carbon Monoxide: Source, harmful effects on human health, control measures. Oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

UNIT – III

SOLID WASTE: Types, sources and properties of solid waste, methods of solid waste treatment and disposal
SOLID WASTE MANAGEMENT – Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

UNIT – IV

Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.
Trace element: Mechanism of distribution, essential and non essential elements, trace of element in marin environment, its ecological effects and biological effects.

Suggested Books:

1. Environmental Engg.: by Howard s. Peavy & Others, MGH International.
2. Metacaf – EDDY – Waste-water engineering revised by George Teholonobus (TMH)
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K.DE, Wiley Eastern.
5. Air Pollution: H.C. Perking – Mc Graw Hill.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

CSE 411B MANAGEMENT INFORMATION SYSTEM							
B. Tech. Semester – VII – Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

FOUNDATIONS:-

INFORMATION SYSTEM: Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, Managing the digital firm, Electronic Commerce and Electronic business, DBMS, RDBMS , introduction to Telecommunication and Networks

I.T.INFRASTRUCTURE:- Managing Hardware Assets, Managing Software Assets, Managing Data Resources. Internet And New It Infrastructure .

UNIT II

CONCEPTUAL SYSTEM DESIGN: Define the problems, set systems objective, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, and prepare the conceptual design report. Information Systems Security and Control, Ethical and Social Impact of Information Systems.

UNIT III

DETAILED SYSTEM DESIGN: Inform and involve the organization, aim of detailed design, project management of MIS detailed design , identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inform and involve the organization again, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, documentation of detailed design

UNIT IV

IMPLEMENTATION, EVALUATION AND MAINTENANCE OF THE MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system, cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development, Redesigning the organization with Information systems, Managing Knowledge Work.

TEXT BOOKS:

1.Management Information System by W. S. Jawadekar, 2002, Tata McGraw Hill.

2.Management Information System by K.C. Laudon & J.P. Laudon 7th Edition 2003 Pearson Education Publishers Indian Reprint.

3.Information System for Modern Management (3rd edition)- Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI

REFERENCE BOOKS:

1.Management Information System; O Brian; TMH

2.Management Information System by Davis Olson Mac Graw Hill

3.Management Information System by Stallings,(Maxwell Mc Millman Publishers)

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

B.TECH. (ELECTRICAL ENGINEERING)

IT413B CYBER SECURITY							
B. Tech. Semester – VII – Open Elective							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
4	**-**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

INTRODUCTION TO CYBERCRIME: Cybercrime and Information Security, Classifications of Cybercrimes, The need for Cyberlaws, The Indian IT Act Challenges to Indian Law and Cybercrime Scenario in India, Weakness in Information Technology Act and it consequences, Digital Signatures and the Indian IT Act, Cybercrime and Punishment; Technology, Students and Cyberlaw; Survival tactics for the Netizens, Cyber-offenses: Cyberstalking, Cybercafe and Cybercrimes, Botnets, Attack Vector, Cloud Computing;

UNIT II

TOOLS AND METHODS USED IN CYBERCRIME: Proxy Servers and Anonymizers, Phishing and identity theft, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow; Cybercrime: Mobile and Wireless Devices: Trends in Mobility, Attacks on Wireless Networks, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/ Cell Phones.

UNIT III

UNDERSTANDING COMPUTER FORENSICS: The Need for Computer Forensics, Cyberforensics and Digital Evidence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Chain of Custody Concept, Network Forensics, Computer Forensics and Steganography, Relevance of the OSI 7 Layer Model to Computer Forensics, Forensics and Social Networking Sites: The Security/ Privacy Threats, Challenges in Computer Forensics, Forensics Auditing, Antiforensics.

UNIT IV

CYBERSECURITY: ORGANIZATIONAL IMPLICATIONS: Cost of Cybercrimes and IPR Issues, Web Threats for Organizations, Security and Privacy Implications from Cloud Computing, Social Media Marketing, Social Computing and the Associated Challenges for Organizations, Protecting People's Privacy in the Organization, Organizational Guidelines for Internet Usage, Safe Computing Guidelines and Computer Usage Policy, Incident Handling, Forensics Best Practices, Media and Asset Protection, Importance of Endpoint Security in Organizations.

TEXT BOOKS:

- "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Nina Godbole, Sunit Belapur, Wiley India Publications, April, 2011

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

EE402B ADVANCED CONTROL SYSTEMS
B.TECH. (ELECTRICAL ENGINEERING), IC
SEMESTER-VIII

L	T	P	Credits		
3	1	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

STATE VARIABLE TECHNIQUES: State variable representation of systems by various methods. Solution of state equations-state transition matrix. Transfer function from state variable model. Controllability & Observability of state variable model, Observer system

UNIT-II

SECOND ORDER SYSTEMS & STATE PLANE: Phase portrait of linear second order systems. Method of isoclines, phase portrait of second order system with non-linearities, limit cycle, singular points, satability of nonlinear system.

UNIT-III

DESCRIBING FUNCTION ANALYSIS: Definition, limitations, use of describing function for stability analysis, describing function of ideal relay, relay with hysteresis & dead zone, saturation/coulomb friction & backlash, Liapunov's 2nd method, Construction of Liapunov Function

UNIT-IV

OPTIMAL CONTROL SYSTEM: Variation calculus: fundamental concepts, Functionals of a single function, fixed end point problems-euler-lagrange equation, variable end point problem and the transversality conditions, Limitations of calculus of variation. Pontryagin's minimum principle.

TEXT BOOK:

1. Digital Control & State Variable Methods: M.Gopal ; TMH.
2. Control Systems Engineering: Nagrath & Gopal, New Age Inter. Publisher.
3. *Control Systems,* Ashfaq Hussain, Haroon Ashfaq, Dhanpat Rai

REFERENCE BOOKS:

1. Modern Control Theory: M.Gopal; Wiley International.
2. Applied non-linear control: J.E.Slotine & W.P.Li; Prentice Hall, USA,
3. Nonlinear Control Systems: Isidori; Springer-Verlag.
4. Optimal Control Theory: An Introduction: Donald E. Krik; PHI.
5. Feedback Control of Dynamic Systems: Feedback Control of Dynamic Systems, Pearson

NOTE

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE404B COMPUTER APPLICATION TO POWER SYSTEM ANALYSIS
B.TECH. (ELECTRICAL ENGINEERING), EEE
SEMESTER-VIII

L	T	P	Credits
3	1	-	4

Class-work Marks	: 25
Exam Marks	: 75
Total Marks	: 100
Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Power Flow equations, Circle diagram, Travelling waves in power Systems, Introduction to graph theory, Tree graph, Co-tree etc.

UNIT-II

Network Analysis in Power Systems: Bus Admittance Matrix, Formation of Y Bus, Primitive admittance matrix, Bus Incidence matrix, Formulation of Y Bus using singular transformation, Formation of twing admittance matrix, Formation of Z loop, Bus Impedance matrix, Algorithm for formulation of Z- Bus. All types of modifications.

UNIT-III

LOAD FLOW STUDIES: Load flow equations, Approximate Load flow study, Gauss-Seidel method for Load flow Study, Algorithm and flow Chart for Computer application to Load flow studies, Newton-Raphson method for Load flow studies, Algorithm and flow chart for Computer Application. Decoupled Load flow Studies, Fast Decoupled Load flow. Comparison between G-S & N-R methods.

UNIT-IV

SYMMETRICAL AND UNSYMMETRICAL FAULT ANALYSIS: Symmetrical Components, Sequence networks for synchronous machines, transforms and transmission Lines, digital technique in short circuit Studies of: Single line to ground fault, Line to Line fault, Double line to Ground fault and symmetrical fault. Consideration of Pre fault currents.

TEXT BOOKS:

1. Power Systems Engineering by S. K. Gupta, Umesh publication, New Delhi
2. Power System Analysis & Design with CD by Glover, Cengage Learning
3. Power System Engg., by B.R.Gupta: S. Chand.
4. Power System Analysis: Hadi Saadat, TMH, New Delhi.
5. Computer Techniques in Power System analysis by M. A. Pai

REFERENCE BOOKS:

1. Advance power system analysis and dynamics by L.P. Singh: Wiley Eastern ltd.
2. Electrical Energy system theory: An introduction by O.I.Elgerd : TMH.
3. Elements of power system analysis by W. D. Stevenson: M.G.H.
4. Power System Engineering by I.J.Nagrath & D.P.Kothari: TMH.
5. Computer methods in power system by G. W. Stagg and A. H. El-Abiad: M.G.H.
6. Power System Operation and Control: N.V.Ramana, Pearson

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE414B COMPUTER APPLICATIONS TO POWER SYSTEM ANALYSIS LAB
B.TECH. (ELECTRICAL ENGINEERING), EEE
SEMESTER-VIII

L	T	P	Credits		
-	-	2	1	Class-work Marks	: 20
				Exam Marks	: 30
				Total Marks	: 50
				Duration of Exam	: 2 Hrs.

LIST OF EXPERIMENTS:

1. Draw the flow chart and develop the computer program for the formation of the Y Bus of a generalized network.
2. Draw the flow chart and develop the computer program for the formation of the Z Bus of a generalized network.
3. To plot the swing curve and observe the stability.
4. To perform load flow study using Gauss-Siedel method.
5. Perform short circuit study for any type of fault.
6. To observe transmission losses and efficiency with variations in power for the given example.
7. Design of distribution system
8. To study the features of EMTP
9. To study the MATLAB Power System block set features.

NOTE:

1. The students will be required to perform the 8 experiments/ exercises from the above list and any other experiments designed on the basis course
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.
3. Electronic gadgets including cellular phones are not allowed in the examination.

EE415B PROJECT
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VIII

L T P		
- - 8	Class-work Marks	: 75
125	Exam Marks	:
200	Total Marks	:
Hrs	Duration of Exam	: 3
	Credits	: 8

The project started in VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairperson of Department/HOD	: Chairperson
Project coordinator	: Member
External expert	: To be appointed by the University

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).
Project coordinator will be assigned the project load of, maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.
The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

EE412B SEMINAR
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VIII

L	T	P		
-	-	2	Class-work Marks	: 50
			Total Marks	: 50
			Credits	: 2

The objectives of the course are:

- To learn how to carry out literature search
- To learn the art of technical report writing
- To learn the art of verbal communication with the help of modern presentation techniques

A student will select a topic in emerging areas of Engineering & Technology and will carry out the task under the observation of a teacher assigned by the department.

He/ She will give a seminar talk on the same before a committee constituted by the Chairperson of the department. The committee shall comprise of two three faculty members from different specializations. The teacher associated in the committee will be assigned 2 hours teaching load per week.

However, guiding students' seminar will not be considered towards teaching load.

The format of the cover page and the organization of the body of the seminar report for all the undergraduate programs will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

GPEE402B GENERAL FITNESS FOR THE PROFESSION

B.TECH. (ELECTRICAL ENGINEERING)

SEMESTER-VIII

L T P		
100	Exam Marks	:
- - 4	Credits	: 4

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

The evaluation will be made by the committee of examiners constituted as under:

1.	Dean, Faculty of Engineering & Technology/Director/Prinicipal	Chairperson
2.	Chairperson of the department	Member
3.	External expert	Appointed by the university

A. The student will present a written report before the committee with the following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting the followings:

I.	Academic Performance	--------
II.	Extra Curricular Activities	**(8 Marks)**
III.	Technical Activities	**(8 Marks)**
IV.	Industrial, Educational tour	**(8 Marks)**
V.	Sports/games	**(8 Marks)**
VI.	Community Service, Hostel Activities	**(8 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/ her achievement and verbal & communicative skill through presentation before the examiners. **(40 Marks)**

C. Faculty Counselor Assignment (20 Marks)

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelope to the committee.

A counselor will assess the student which reflecting on his/ her learning graph including the followings:

1. Discipline throughout the year.
2. Sincerity towards study.
3. How quickly the student assimilates professional value system, etc.

DEPARTMENTAL ELECTIVE-I
EE432B EXTRA HIGH VOLTAGE AC / DC
B.TECH. (ELECTRICAL ENGINEERING)
SEMESTER-VIII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Break Down Mechanism of Gaseous Materials: Mechanism of Breakdown of gases, Townsend's first Ionization Co-efficient, Townsend's second Ionization Co-efficient, Townsend's Breakdown Mechanism, Streamer Theory of Breakdown in gases, Paschen's law.

UNIT-II

Breakdown in Liquid and Solid Dielectrics: Suspended Particle Theory, Cavity Breakdown, Electro-convection Breakdown, Breakdown in solid Dielectrics, Intrinsic Breakdown, Electromechanical Breakdown, Breakdown due to Treeing and Tracking, Thermal Breakdown, Electrochemical Breakdown

UNIT-III

Generation of High Voltage AC. and D.C: Half wave and Full wave Rectifier, Cockroft Walton Voltage Multiplier Circuit, Ripple in Multiplier Circuit, Generation of High Alternative Voltage, Cascade Transformer, Resonant Transformer, Generation of High Frequency A.C. High Voltage, Impulse Generator, Multistage Impulse Generator, Marx's Circuit, Generation of Switching Surges, , Tripping and Control of Impulse Generator.

UNIT-IV

High Voltage Testing & Measurement : Sphere-Gap, Uniform field Spark gap, Rod Gap, Electrostatic Voltmeter, Generating Voltmeter, Impulse Voltage Measurement using Voltage divider, Measurement of high DC, AC and Impulse Current., Testing of line Insulator, Testing of Cable, Testing of Bushings, Testing of Power Capacitor, Testing of Power Transformers, Testing of Circuit Breaker.

TEXT BOOK:

1. High Voltage Engineering By M.S. Naidu & V. Kamaraju -TMH Publication
2. *ccHVDC Transmission,* S Kamakshaiah/V Kamaraju, Mc Graw Hill

REFERENCE BOOKS:

1. J. Arrillaga, High Voltage Direct Current Transmission. Pub: Peter Peregrinus Ltd. on behalf of E.E Power Engg. Series.
2. Rakos Das Begamudre, Extra EHV A.C Transmission. PHI Publication.
3. C.L Wadhwa , High Voltage Engineering. Pub.: New Age International Ltd.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE434B ADVANCED INSTRUMENTATION
B.TECH. (ELECTRICAL ENGINEERING), SEMESTER-VIII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Functional block diagram of generalized Instrumentation system. Input-output configuration, specifications under steady and transient state & their performance characteristics.

UNIT-II

REVIEW OF SENSORS AND TRANSDUCERS: Temperature, pressure, displacement, velocity, acceleration, strain and torque type.

UNIT-III

SIGNAL CONDITIONING: Current & voltage sensitive bridges, Blumlein Bridges, Shielding & grounding, Instrumentation Amplifier & its Characteristics, Linearizing circuits, Wave form and frequency conversion, Acitve filters, A/D & D/A converters; Balanced modulators & demodulators.

UNIT-IV

MICROCONTROLLER BASED INSTRUMENTATION SYSTEM: Interfacing of 8051 Microcontroller with (a) ADC and DAC, (b) Alphanumeric Devices (Sixteen-segment Display, Dot Matrix Displays, LCD Display).

REFERENCE BOOKS:

1. E.O. Doeblin, Measurement System – Application & Design. TMH
2. A.K. Sawhney, A Course in Electrical & Electronics Measurement & Instrumentation. Pub.: Dhanpat Rai & Sons.
3. C.S. Rangan, G.R. Sarma, V.S.V. Mani, Instrumentation Devices & Systems. New Delhi: Tata McGraw-Hill Pub. Co. Ltd.
4. Oliver & Cage, Electronic Measurement & Instrumentation.
5. Raj Kamal, Microcontrollers: Architecture, Programming, Interfacing and System Design. Delhi: Pearson Education (Singpaore) Pte. Ltd., Indian Branch.
6. Kenneth. J. Ayala, The 8051 Microcontrollers – Architecture, Programming & Applications. Mumbai: Penram International Publishing (India) Pvt. Ltd..
7. Scott Mackenzie, The 8051 Microcontrollers. Englewood Cliffs: Prentice Hall Pub. Co.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.

EE424B FUZZY CONTROL SYSTEMS
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits
4	-	-	4

Class-work Marks	: 25
Exam Marks	: 75
Total Marks	: 100
Duration of Exam	: 3 Hrs.

UNIT-I

FUZZY CONTROL & ITS MATHEMATICS : Fuzzy control from an industrial perspective, knowledge representation in KBC's, Vagueness, fuzzy logic versus probability theory, fuzzy sets; their properties & operations on fuzzy sets, fuzzy relations & operations on fuzzy relations, the Extension Principle, Fuzzy propositions, The Compositional Rule of Inference, Different implications, Representing a set of rules.

UNIT-II

FKBC DESIGN PARAMETERS: The FKBC architecture, choice of variables & content of rules, Derivation of rules, choice of membership functions, choice of scaling factors, choice of fuzzification procedure, choice of defuzzification procedure, comparison and evaluation of defuzzification methods.

UNIT-III

NONLINEAR & ADAPTIVE FUZZY CONTROL: The Control Problem, The FKBC as a Non-Linear Transfer Element, Types of FKBC such as PID-like FKBC, Sliding Mode FKBC, Sugeno FKBC, Adaptation mechanism for FKBC Design & Performance Evaluation, Approaches to Design such as membership function tuning using gradient descent, membership function tuning using performance criteria, the self-organizing controller, model based controller.

UNIT-IV

STABILITY OF FKBC & INTRODUCTION TO NEURO FUZZY CONTROLLERS: The State space approach, Stability and robustness indices , input-output stability, circle criterion, Application of the Circle Criterion to Design, Conicity criterion, Neural networks based Fuzzy controllers & their applications.

TEXT BOOKS:

1. An Introduction to Fuzzy Control: D.,Driankov, H.Hellendoorn and M.Reinfrank.; Narosa Publications.
2. Klir, G.J. & Yuan,B.,' Fuzzy sets and Fuzzy logic, theory and applications', Prentice Hall India Private Limited.

REFERENCE BOOKS:

1. Fuzzy Control Systems by Abraham Kandel and Gideon Imngholz; Narosa Publications.
2. Bart Kosko, 'Neural Network & Fuzzy System', PHI

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE438B RECENT TRENDS IN DEREGULATED POWER SYSTEMS
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Deregulation of the Electricity Supply Industry: Background of deregulation and the current situation, Benefits from a competitive Electricity Market, After effects of Deregulation.

UNIT-II

Power System Operation in Competitive Environment: Role of Independent System operator, Operational Planning activities of ISO, operational planning activities of Genco.

UNIT-III

Transmission open Access and Pricing Issues: Power Wheeling, Transmission Open Access, Cost component in Transmission, Pricing of Power Transmissions, Security Management in Deregulated environment, Congestion management in Deregulation.

UNIT-IV

Reliability and Deregulation: Reliability Analysis, Optimal Power Flow as a Basic Tool, Unit Commitment, Formation of Power Pools.

REFERENCE BOOKS:

1. Lei Lee Lal, Power System Restructuring and Deregulation. UK: John Wiley and Sons, 2001.
2. Kankar Bhattacharya, Math H.J.Bollen and Jaap E. Daalder, Operation of Restructured Power Systems. USA: Kluwer Academic Publishers, 2001.
3. Md Shahidehpour and Muwaffaq Alomoush, Restructured Electrical Power Systems. Marcel Dekker, Inc.
4. S.S. Rao, Switch Gear Protection and Power System Analysis. Khanna Publications.

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

2. The students will be allowed to use non-programmable scientific calculator. However, sharing/ex-change of calculator are prohibited in the examinations.

EE466B UTILIZATION OF ELECTRIC POWER AND TRACTION
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

ILLUMINATION: Basic laws of illumination, light sources and their characteristics, sources of light, design of lighting schemes, incandescent lamp, sodium lamp, mercury lamp and fluorescent lamp, comparison of various lamps, LED,CFL Lamp.

UNIT-II

ELECTRIC HEATING & WELDING: Principle and application of resistance, induction and dielectric heating., Resistance welding, arc welding, welding generator and welding transformer, properties of arcing electrode.

UNIT-III

ELECTROLYTIC PROCESS: Principles and applications of electrolysis. Faraday's law of electrolysis, electroplating, charging and discharging. Capacity and efficiency of battery, defects in battery, maintenance of battery.

UNIT-IV

ELECTRIC TRACTION: Systems of electric traction, traction motors, traction motor control, multi unit control, braking of electric motors, thyristor control of electric traction., Types of services, speed time and speed distance curves, average and schedule speed, Estimation of power and energy requirements: specific energy consumption. Mechanics of train movement coefficient of adhesion, Adhesive weight, effective weight.

REFERENCE BOOKS:

1. Utilization of Electrical Energy : Open Shaw Taylor ; ELBS
2. Art and Science of Utilization of Electrical Energy : H. Pratab ; Dhanpat Rai & Sons, Delhi.
3. Generation, Distribution and Utilization of Electrical Power : C.L. Wadhwa ; Khanna Pub.
4. H.Pratab,"Electric Traction", Dhanpat Rai & Sons.
5. *Utlization of Electrical Energy,* H.Partab, Dhanpat Rai

NOTE:

.In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

DEPARTMENTAL ELECTIVE-II

EE442B HIGH VOLTAGE ENGINEERING
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

CONDUCTION AND BREAKDOWN: Recent trends in high voltage transmission Conduction & breakdown in gases, liquids and solid dielectrics, insulator breakdown, insulation characteristics of long air gaps.

UNIT-II

METHODS OF HIGN VOLTAGE GENERATION : Methods of generation of power frequency high voltage: cascaded transformers and resonance transformers Generation of high voltage DC, voltage multiplier circuits. Electrostatic Generation:Van de Graff machine and its voltage stabilisation. Impulse voltage generation.: Basic impulse circuit, single stage impulse generator, multistage impulse generator (Marx circuit) ,.

UNIT-III

PROTECTION OF SYSTEM AGAINST SURGES : Ground wires, protective angle,tower footing resistance,surge diverters. Gap type and gapless lightning arresters. Insulation coordination, basic insulation levels. Voltage-time curve, impulse ratio.

UNIT-IV

LIGHTENING: Lightening phenomenon, lightning stroke mechanism, principle of lightning protection, tower foot resistance, insulator flash over and withstand voltage, lightning arresters and their characteristics, testing, generation of direct voltage, measurement of high voltage, general layout of H.V. Laboratory.

TEXT BOOKS:

1. E.H.V. AC Transmission: R.D. Begamudre, Wiley Eastern Ltd.
2. H.V. Engg.: V. Kamaraju and M.S. Naidu, T.M.H., N.Delhi.

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE444B ELECTRICAL POWER QUALITY

B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

Introduction to Electrical Power Quality: Power Quality, Concern in Power System, Power Quality Issues, Standards of Power Quality.

Voltage Sags and Interruptions: Sources of Sags and Interruptions, Fundamental Principles of Protection, Solutions at End User Level, Comparison of Different Ride-Through Alternatives.

UNIT-II

Transient Overvoltages: Sources of Transient Overvoltages, Principles of Overvoltage Protection, Devices for Overvoltage Protection, Strategies for Utility System Lightning Protection, Switching Transient Problems with Loads.

Harmonics: Harmonics Distortion, Power System Quantities under Nonsinusoidal Conditions, Harmonic Indices, Harmonics Sources from Commercial and Industrial Loads, Effects of Harmonic Distortion on Power System Equipments.

UNIT-III

Wiring and Grounding: Reasons for Grounding, Typical Wiring and Grounding Problems, Solutions to wiring and Grounding Problems.

Power Quality Monitoring and Evaluation: Power Quality Monitoring and its Objective, Power Quality Measurement Equipments, Power Quality Evaluation, Different Power Quality Indices used in Power Quality Evaluation.

UNIT-IV

Power Quality Conditioners: Passive Filters, Active Filters, Hybrid Filters, STATCOM, DSTATCOM, DVR, UPQC.

Distributed Generation and Power Quality: Distributed Generation and its Advantages and Disadvantages, Different Distributed Generation Technologies, Different Interfacing Electrical Systems, Power Quality Issues in Distributed Generation.

TEXT BOOKS:

1. Electric Power Systems Quality : R.C. Dugan, M. F. McGranaghan and H.W. Beaty, McGraw-Hill.

REFERENCE BOOKS:

1. Power System Harmonics: J. Arrillaga, D.A. Bradely and P.S. Bodger, Wiley.
2. Electric Power Quality: G.T. Heydt, Stars in a Circle.
3. Embedded Generation: N. Jenkins, R. Allan, P. Crossley, D. Kirschan and G. Strbac, IEEE Power and Energy Series.
4. Power Quality: C. Sankaran, CRC press.
5. IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems, IEEE Std. 519, 1992.
6. IEEE Recommended Practices on Monitoring Electric Power Quality, IEEE Std.1159, 1995.

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE446B ARTIFICIAL INTELLIGENCE
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits		
4	-	-	4	Class-work Marks	: 25
				Exam Marks	: 75
				Total Marks	: 100
				Duration of Exam	: 3 Hrs.

UNIT-I

FOUNDATIONAL ISSUES IN ARTIFICIAL INTELLIGENCE: Foundation and history of AI, AI problems and techniques, AI programming languages, introduction to LISP and PROLOG, problem spaces and searches, blind search strategies, Breadth first- Depth first - heuristic search techniques, Hill climbing, best first - A* algorithm, AO* algorithm- game tree, Min max algorithms, game playing- alpha beta pruning.

UNIT-II

KNOWLEDGE REPRESENTATION: Issues, predicate logic, logic programming, semantic nets, frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

APPROXIMATE REASONING: Reasoning under uncertainty, review of probability, Baye's probabilistic inferences and Dempster Shafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non-monotonic reasoning.

UNIT-III

PLANNING & LEARNING: Planning in situational calculus, Representation for planning, Partial order planning algorithm, Learning from examples, Discovery as learning, Learning by analogy, Explanation based learning, Introductory remarks on learning by Neural Networks and Genetic Algorithms.

UNIT-IV

APPLICATIONS: Rule based systems architecture, Expert systems, Knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

TEXT BOOK:

1. Artificial Intelligence: A Modern Approach,. Russell & Norvig. Prentice Hall, 1995.

REFERENCE BOOKS:

1. Elain Rich and Kevin Knight, "Artificial Intelligence", TMH, 1991.
2. Staurt Russel and Peter Norvig, "Artificial Intelligence - A modern approach", PHI, 1998.
3. Patrick Henry Winston, "Artificial intelligence", 3rd Ed., Addition Wesley, 1992.
4. Dan W. Patterson, "Artificial Intelligence", PHI, 1990

NOTE:

1. In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE426B COMPUTER BASED INSTRUMENTATION AND CONTROL
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits
4	-	-	4

Class-work Marks	: 25
Exam Marks	: 75
Total Marks	: 100
Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Necessity and functions of computers. Level of automation and economy of computer control, Centralized computer control Vs distributed computer control.
COMPUTER ARCHITECTURE: Micro and minicomputer, functional models of I.O. system.

UNIT-II

INTERFACING: Sampling; Multiplexing; A/ D and D/ A converters, interfacing with different types of transducers - Analog / Digital, Electrical and non-electrical selection of sensors; Micro computer interfacing of standard buses, Serial buses; Serial data communication protocols.

UNIT-III

STRUCTURAL STUDY OF AUTOMATIC PROCESS CONTROL: Fundamental of automatic process control, building blocks of automatic system direct and distributed digital control system. Programmable controllers.
PERSONAL COMPUTER IN REAL LIFE ENVIRONMENT: Introduction, personal computer: system and facility, PC bus and signals, interrupts, interfacing PC with outer world, PC in RTE, Real time application of IBM PC, PC-based distributed control system

UNIT-IV

PROGRAMMING AND APPLICATION: Modeling and simulation for plant automation, PLC Architecture and programming of PLC, industrial control application: cement plant, thermal power plant, water treatment plant, steel plant,

TEXT BOOK:

1. Computer based industrial control: Krishan Kant,; PHI

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.

EE450B POWER MANAGEMENT
B. TECH. ELECTRICAL ENGG. , SEMESTER - VII

L	T	P	Credits
4	-	-	4

Class-work Marks	: 25
Exam Marks	: 75
Total Marks	: 100
Duration of Exam	: 3 Hrs.

UNIT-I

INTRODUCTION: Power Scenario, Power Development, Planning, Power resources, Environment-Power matters Plan, Pre-feasibility and feasibility studies, State relations for Power etc. **Aspects of Risk & Hazard Health & risk assessment visit to site.**

UNIT-II

RESOURCES & PROCUREMENT: Resources, Geophysical study, Seismic Considerations, Environmental Restraints, Resettlement and Rehabilitation. Contracting and Procurement, Consulting Services, Contracts, Project Management.

UNIT-III

ENGINEERING: Engineering & General Layout of Equipments, Generator, Transformer and Switch Gear and Control Equipment, Construction Methods, Operation and Maintenance Principle, Maintenance organization and planning, Availability, life cycle cost & future development. Visits to sites.

UNIT-IV

POWER SECTOR & STATION: Power sector structure in different states, Regulatory Regime in those states, Power utilities in Haryana, Grid management, Power financing, Visit to sites. Management of Fuel, water Resource Electricity deviend scenario storage and handling, Pricing, Contract etc, Human resource management, Visit to sites.State and Central Power boards / Power corporations.

REFERENCE BOOKS:

1. Electricity Bill, Safety & Conservation Act
2. Arora & Dom Kundwar, A Course in Power Plant Engineering, Pub.: Dhanpat Rai Pub, 2000.
3. Jain & Bala Subranmanyam, “Power Plant Engineering”, Dhanpat Rai Pub.,
4. Butter Worth, A.B. Gill, “Power Plant Performance Management”, Pub:1984.
5. P.C. Sharma, “Power Plant Engineering”, Dhanpat Rai Pub.,
6. David A. Decenzo, Stephen P. Robbins, Human Resource Management. New Delhi: PHI Pvt. Ltd., 2004.
7. P.K. Nag, Power Plant Engg. N.Delhi: TMH, 2003.

NOTE:

In the semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all selecting at least one from each unit. All questions will carry equal marks.