GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)
(Deemed to be University, Estd. u/s 3 of UGC Act 1956)
∗VISAKHAPATNAM ∗HYDERABAD ∗BENGALURU∗
Accredited by NAAC with 'A' Grade

REGULATIONS & SYLLABUS

of

Bachelor of Technology
in
Electronics & Instrumentation Engineering
Programme Code: EUREI 200801

(W.e.f 2012-13 admitted batch)

Website: www.gitam.edu

B.Tech. (Electronics & Instrumentation Engineering)
Programme Code: EUREI 200801
REGULATIONS
(W.e.f. 2012-13 admitted batch)

1.0 ADMISSIONS

1.1 Admissions into B.Tech. (Electronics & Instrumentation Engineering) programme of GITAM University are governed by GITAM University admission regulations.

2.0 ELIGIBILITY CRITERIA

2.1 A pass in 10+2 or equivalent examination approved by GITAM University with Physics, Chemistry and Mathematics.

2.2 Admissions into B.Tech. will be based on an All India Entrance Test (GAT) conducted by GITAM University and the rule of reservation, wherever applicable.

3.0 STRUCTURE OF THE B.Tech. PROGRAMME

3.1 The Programme of instruction consists of:

(i) A general core programme comprising Basic Sciences, Basic Engineering, Humanities & Social Sciences and Mathematics.
(ii) An engineering core programme imparting to the student the fundamentals of engineering in the branch concerned.
(iii) An elective programme enabling the students to take up a group of departmental / interdepartmental courses of interest to him/her.

In addition, a student has to

(i) Carry out a technical project approved by the department and submit a report.
(ii) Undergo summer training in an industry for a period prescribed by the department and submit a report.

3.2 Each academic year consists of two semesters. Every branch of the B. Tech. programme has a curriculum and course content (syllabi) for the courses recommended by the Board of Studies concerned and approved by Academic Council.

4.0 CREDIT BASED SYSTEM

4.1 Each course is assigned certain number of credits which will depend upon the number of contact hours (lectures & tutorials) per week.

4.2 In general, credits are assigned to the courses based on the following contact hours per week per semester.

One credit for each Lecture / Tutorial hour.
One credit for two hours of Practicals.
Two credits for three (or more) hours of Practicals.

4.3 The curriculum of B. Tech. programme is designed to have a total of 190 to 200 credits for the award of B. Tech. degree.

4.4 Every course of the B. Tech. programme will be placed in one of the nine groups of courses with minimum credits as listed in the Table 1.

4.5 - Table 1: Group of Courses

S.No.	Group of Courses	Code	Minimum credits
1	Humanities & Social Sciences	HS	12
2	Basic Sciences	BS	17
3	Mathematics	MT	10
4	Basic Engineering	BE	26
5	Core Engineering	CE	68
6	Departmental Elective	DE	9
7	Inter Departmental Elective	IE	8
8	Project Work	PW	8
9	Industrial Training	IT	2
	Total		160

5.0 MEDIUM OF INSTRUCTION

The medium of instruction (including examinations and project reports) shall be English.

6.0 REGISTRATION

Every student has to register himself/herself for each semester individually at the time specified by the Institute / University.

7.0 CONTINUOUS ASSESSMENT AND EXAMINATIONS

7.1 The assessment of the student's performance in each course shall be based on continuous evaluation and Semester-end examination. The marks for each component of assessment are as shown in the Table 2.

Table 2: Assessment Procedure

S. No.	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Evaluation
1	Theory	40	Continuous Evaluation	i) Thirty (30) marks for mid Semester examinations. Three mid examinations shall be conducted for 15 marks each; performance in best two shall be taken into consideration. ii) Ten (10) marks for Quizzes, Assignments and Presentations.
		60	Semester-end Examination	Sixty (60) marks for Semester-end examinations
	Total	100		
2	Practicals	100	Continuous Evaluation	i) Fifty (50) marks for regularity and performance, records and oral presentations in the laboratory. Weightage for each component shall be announced at the beginning of the Semester. ii) Ten (10) marks for case studies. iii) Forty (40) marks for two tests of 20 marks each (one at the mid-term and the other towards the end of the Semester) conducted by the concerned lab Teacher.
3	Project work (VII & VIII Semesters)	100	Continuous Evaluation	i) Forty (40) marks for periodic evaluation on originality, innovation, sincerity and progress of the work, assessed by the Project Supervisor. ii) Thirty (30) marks for mid-term evaluation for defending the Project, before a panel of examiners*. iii) Thirty (30) marks for final Report presentation and Viva-voce, by a panel of examiners*
4	Industrial Training (VII Semester)	100	Continuous Evaluation	i) Thirty (30) marks for Project performance, assessed by the Supervisor of the host Industry/Organization. Submission of Project Completion Certificate from host organization is mandatory. ii) Forty (40) marks for Report and Seminar presentation on the training, assessed by the Teacher Coordinator. iii) Thirty (30) marks for presentation on the training, before a panel of examiners*.
5	Comprehensive Viva-voce (VIII Semester)	100	Continuous Evaluation	Through five periodic Viva-voce exams for 20 marks each, conducted by a panel of examiners*. The course content for Viva exams shall be announced at the beginning of the Semester.

Panel of Examiners shall be appointed by the concerned Head of the Department.

8.0 RETOTALLING, REVALUATION & REAPPEARANCE

8.1 Retotaling of the theory answer script of the end-semester examination is permitted on a request made by the student by paying the prescribed fee within ten days of the announcement of the result.

8.2 Revaluation of the theory answer script of the end-semester examination is also permitted on a request made by the student by paying the prescribed fee within fifteen days of the announcement of the result.

8.3 A Student who has secured 'F' Grade in any theory course / Practicals of any semester shall have to reappear for the semester end examination of that course / Practicals along with his / her juniors.

8.4 A student who has secured 'F' Grade in Project work / Industrial Training shall have to improve his report and reappear for viva – voce Examination of project work at the time of special examination to be conducted in the summer vacation after the last academic year.

9.0 SPECIAL EXAMINATION

9.1 A student who has completed the stipulated period of study for the degree programme concerned and still having failure grade ('F') in not more than 5 courses (Theory / Practicals), may be permitted to appear for the special examination, which shall be conducted in the summer vacation at the end of the last academic year.

9.2 A student having 'F' Grade in more than 5 courses (Theory/practicals) shall not be permitted to appear for the special examination.

10.0 ATTENDANCE REQUIREMENTS

10.1 A student whose attendance is less than 75% in all the courses put together in any semester will not be permitted to attend the end - semester examination and he/she will not be allowed to register for subsequent semester of study. He /She has to repeat the semester along with his / her juniors.

10.2 However, the Vice Chancellor on the recommendation of the Principal / Director of the University College / Institute may condone the shortage of attendance to the students whose attendance is between 66% and 74% on genuine medical grounds and on payment of prescribed fee.

11.0 GRADING SYSTEM

11.1 Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester in each course. The letter grades and the corresponding grade points are as given in Table 3.

Table 3: Grades & Grade Points

Grade	Grade points	Absolute Marks
O	10	90 and above
A+	9	80 – 89
A	8	70 – 79
B+	7	60 – 69
B	6	50 – 59
C	5	40 – 49
F	Failed, 0	Less than 40

11.2 A student who earns a minimum of 5 grade points (C grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course. However, a minimum of 24 marks is to be secured at the semester end examination of theory courses in order to pass in the theory course.

12.0 GRADE POINT AVERAGE

12.1 A Grade Point Average (GPA) for the semester will be calculated according to the formula:

$$GPA = \frac{\Sigma\,[\,C \times G\,]}{\Sigma\,C}$$

Where
  C = number of credits for the course,
  G = grade points obtained by the student in the course.

12.2 Semester Grade Point Average (SGPA) is awarded to those candidates who pass in all the courses of the semester.

12.3 To arrive at Cumulative Grade Point Average (CGPA), a similar formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.

12.4 The requirement of CGPA for a student to be declared to have passed on successful completion of the B.Tech. programme and for the declaration of the class is as shown in Table 4.

Table 4: CGPA required for award of Degree

Distinction	$\geq 8.0^*$
First Class	≥ 7.0
Second Class	≥ 6.0
Pass	≥ 5.0

* In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester in first attempt.

13.0   ELIGIBILITY FOR AWARD OF THE B.Tech. DEGREE

13.1   Duration of the programme:
A student is ordinarily expected to complete the B.Tech. programme in eight semesters of four years. However a student may complete the programme in not more than six years including study period.

13.2   However the above regulation may be relaxed by the Vice Chancellor in individual cases for cogent and sufficient reasons.

13.3   A student shall be eligible for award of the B.Tech. degree if he / she fulfills all the following conditions.

a) Registered and successfully completed all the courses and projects.
b) Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.
c) Has no dues to the Institute, hostels, Libraries, NCC / NSS etc, and
d) No disciplinary action is pending against him / her.

13.4   The degree shall be awarded after approval by the Academic Council.

RULES

1. With regard to the conduct of the end-semester examination in any of the practical courses of the programme, the Head of the Department concerned shall appoint one examiner from the department not connected with the conduct of regular laboratory work, in addition to the teacher who handled the laboratory work during the semester.

2. In respect of all theory examinations, the paper setting shall be done by an external paper setter having a minimum of three years of teaching experience. The panel of paper setters for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council. The paper setters are to be appointed by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations.

3. The theory papers of end-semester examination will be evaluated by internal/external examiner.

4. Panel of examiners of evaluation for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council.

5. The examiner for evaluation should possess post graduate qualification and a minimum of three years teaching experience.

6. The appointment of examiners for evaluation of theory papers will be done by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations from a panel of examiners approved by the Academic Council.

Scheme of Instruction : Programme Code: EUREI 200801
B.Tech. (EIE) – I SEMESTER

Course Code	Name of the Course	Category	Credits	Hours per week L/T	Hours per week D/P	Duration in Hrs.	Sem. End Exam	Con. Eval
EUREG 101	Engg. English – I	HS	3	3	---	3	60	40
EURMT 102/ EIRMT 102	Engg. Mathematics	MT	4	4	---	3	60	40
EURPH 103	Engg. Physics - I	BS	4	4	---	3	60	40
EURCH 104	Engg. Chemistry – I	BS	4	4	---	3	60	40
EURCS 105	Programming with C	BE	3	3	---	3	60	40
EURCS 113	Programming with C Lab	BE	2	---	3	3	--	100
EURPH 112	Engg. Physics Lab	BS	2	---	3	3	--	100
EURME 115	Engineering Graphics Practice	BE	2	---	4	3	--	100
	Total:		24	18	09	---	300	500

B.Tech. (EIE) – II SEMESTER

Course Code	Name of the Course	Category	Credits	Hours per week L/T	Hours per week D/P	Duration in Hrs.	Sem. End Exam	Con Eval
EUREG 201	Engg. English – II	HS	3	3	---	3	60	40
EURMT 202/ EIRMT 202	Higher Engineering Mathematics – I	MT	3	3	---	3	60	40
EURMT 203/ EIRMT 203	Higher Engineering Mathematics – II	MT	3	3	---	3	60	40
EURPH 204	Engg. Physics - II	BS	3	3	---	3	60	40
EURCH 205	Engg. Chemistry – II	BS	3	3	---	3	60	40
EURCS 206	Object Oriented programming with C++	BE	3	3	---	3	60	40
EURCS 213	Object oriented programming with C++ Lab	BE	2	---	3	3	--	100
EURCH 214	Engg. Chemistry Lab	BS	2	---	3	3	--	100
EUREE 217	Electrical & Electronics Workshop Lab	BE	2	---	3	3	--	100
			24	18	10	---	360	540

B.Tech. (EIE) – III SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREI 301/ EUREC 301/ EUREE 301/ EIREC 301	Advanced Engg Mathematics	MT	3	60	40	100	3	0	-	3
EUREI302	Thermal Engg. and Fluid Mechanics	CE	3	60	40	100	3	0	-	3
EUREI303	Network Theory	BE	3	60	40	100	3	0	-	3
EUREI304	Electronic Devices and Circuits	BE	3	60	40	100	3	0	-	3
EUREI305	Sensors and Transducers	CE	3	60	40	100	3	0	-	3
EUREI306	Data Structures Using C	CE	3	60	40	100	3	0	-	3
EUREI311	Sensors and Transducers lab	CE	2	-	100	100	-	-	3	3
EUREI312	Electronic Devices and Circuits lab	BE	2	-	100	100	-	-	3	3
	Total		22	360	440	800	18	0	6	24

B.Tech. (EIE) – IV SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREI401	Digital Electronics	CE	3	60	40	100	3	0	-	3
EUREI402	Electronic Circuits and Analysis	CE	3	60	40	100	3	0	-	3
EUREI403	Electrical and Electronic Measurements	CE	3	60	40	100	3	0	-	3
EUREI404	Signals & Systems	CE	3	60	40	100	3	0	-	3
EUREI405	Environmental Studies	HS	4	60	40	100	4	0	-	4
EUREI406	Electrical Machines	BE	3	60	40	100	3	0	-	3
EUREI411	Networks and Electrical machines Lab	BE	2	-	100	100	-	-	3	3
EUREI412	Electronic Circuit Analysis lab	CE	2	-	100	100	-	-	3	3
EUREI413	Measurements Lab	CE	2	-	100	100			3	3
EUREI414	Industrial Tour	IT	Non-Credit Audit Course							
	Total		25	360	540	900	19	0	9	28

B.Tech. (EIE) – V SEMESTER

Course code	Name of the Course	Category	Credits	Semester End xam	Con. Eval.	Total	L	T	P	Total
EUREI501	Microprocessors & Interfacing	CE	3	60	40	100	3	0	-	3
EUREI502	Linear IC's & Applications	CE	3	60	40	100	3	0	-	3
EUREI503	Industrial Instrumentation –I	CE	3	60	40	100	3	0	-	3
EUREI504	Control Systems	CE	4	60	40	100	3	1	-	4
EUREI505	Principles of Communication Engg.	CE	3	60	40	100	3	0	-	3
EUREI506	Digital Signal Processing	CE	3	60	40	100	3	0	-	3
EUREI511	Digital ICs & Linear ICs Lab	CE	2	-	100	100	-	-	3	3
EUREI512	Microprocessors Lab	CE	2	-	100	100			3	3
	Total		23	360	440	800	18	1	06	25

B.Tech. (EIE) – VI SEMESTER

Course code	Name of the Course	Category	Credits	Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREI 601	Industrial Electronics	CE	3	60	40	100	3	0	-	3
EUREI 602	Analytical Instrumentation	CE	3	60	40	100	3	0	-	3
EUREI 603	Industrial Instrumentation –II	CE	3	60	40	100	3	0	-	3
EUREI 604	Bio Medical Instrumentation	CE	3	60	40	100	3	0	-	3
EUREI 605/ EUREC 605/ EIREC 604	Engg Economics & Management	HS	3	60	40	100	3	0	-	3
EUREI 606	Process Control	CE	4	60	40	100	4	0	-	4
EUREI 611	Process Control Lab	CE	2	-	100	100	-	-	3	3
EUREI 612	BMI and Signal Processing Lab	CE	2	-	100	100	-	-	3	3
EUREI613	Advanced Communication Skills & English Language Laboratory	HS	2	-	100	100	-	-	3	3
EUREI614	Personality Development	HS	Non Credit Audit Course						3	3
	Total		25	360	540	900	19	0	12	31

B.Tech. (EIE) – VII SEMESTER

Course code	Name of the Course	Category	Credits	Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREI701	Digital System Design Using Verilog	CE	3	60	40	100	3	0	-	3
EUREI702	Microcontrollers and Applications	CE	3	60	40	100	3	0	-	3
EUREI703	Computer Control of Processes	CE	3	60	40	100	3	0	-	3
EUREI 721-723	Departmental Elective I	DE	3	60	40	100	3	0	-	3
EUREI 731-733	Departmental Elective II	DE	3	60	40	100	3	0	-	3
EUREI711	Virtual Instrumentation Lab	CE	2	-	100	100	-	-	3	3
EUREI712	Microcontrollers Lab	CE	2	-	100	100	-	-	3	3
EUREI713	Project I	PW	3	-	100	100	-	-	6	6
EUREI714	Industrial Training	IT	2	-	100	100	-	-	-	-
	Total		24	300	600	900	15	0	12	27

B.Tech. (EIE) – VIII SEMESTER

Course code	Name of the Course	Category	Credits	Semester End Exam	Con. Evl.	Total	L	T	P	Total
EUREI801	Embedded Systems	CE	3	60	40	100	3	-	-	3
EUREI 841 - 843	Departmental Elective III	DE	3	60	40	100	3	0	-	3
EUREI 851-8516**	Inter Departmental Elective I	IE	4	60	40	100	3	1	-	4
EUREI 861-8619**	Inter Departmental Elective II	IE	4	60	40	100	3	1	-	4
EUREI811	Industrial Instrumentation Lab	CE	2	-	100	100	-	-	3	3
EUREI812	Project II	PW	5	-	100	100	-	-	9	9
EUREI813	Comprehensive Viva	CE	2	-	100	100	-	-	-	-
	Total		23	240	460	700	12	2	12	26

** Inter Departmental Elective will be from other departments. The list of courses that would be offered by the department in any semester will be notified from which student may select a course.

B.Tech. (EIE) – DEPARTMENTAL ELECTIVE-I

Course Code	Name of the Course	Category	Credits
EUREI721	Optimal Control	DE	3
EUREI722	Robotics and Automation	DE	3
EUREI723	Data Communication & Networks	DE	3

DEPARTMENTAL ELECTIVE-II

Course Code	Name of the Course	Category	Credits
EUREI731	Virtual Instrumentation	DE	3
EUREI732	Neural Networks & Fuzzy Logic	DE	3
EUREI733	Digital Image Processing	DE	3

DEPARTMENTAL ELECTIVE-III

Course Code	Name of the Course	Category	Credits
EUREI841	Fiber Optics & Laser Instrumentation	DE	3
EUREI842	Instrumentation for Petrochemical Industry	DE	3
EUREI843	Digital Control Systems	DE	3

B.Tech. (EIE) – INTER-DEPARTMENTAL ELECTIVE-I

Course Code	Name of the Course
EUREI 851	Remote Sensing& GIS
EUREI 852	Data Base Management Systems
EUREI 853	Software Engineering
EUREI 854	Systems Modeling and Simulation
EUREI 855	Software Project Management
EUREI 856	Artificial Intelligence
EUREI 859	Power Electronics
EUREI 8510	Project Planning and Management
EUREI 8512	Introduction to Micro Electro Mechanical Systems (MEMS)
EUREI 8513	Entrepreneurship
EUREI 8514	Public Administration
EUREI 8516	Equipment for construction Industry

INTER-DEPARTMENTAL ELECTIVE-II

Course Code	Name of the Course
EUREI 861	Environmental Impact Assessment
EUREI 862	Operating Systems
EUREI 863	Web Technologies
EUREI 865	Computer Aided Design
EUREI 867	Mechatronics
EUREI 868	Education Research & Methodologies
EUREI 869	Professional Ethics
EUREI 8611	Thermodynamics
EUREI 8614	Very Large Scale Integrated System Design (VLSI)
EUREI 8615	Fundamentals of Civil Engineering
EUREI 8616	Engineering Materials
EUREI 8617	Computer Networks
EUREI 8619	Managerial & Engineering Economics

B.Tech. (EIE)

Details of category wise minimum credits as per AICTE norms and actual credits allocated are as follows:

S.No.	Category	Code	Credits	Minimum credits
01.	Humanities & Social Sciences	HS	15	12
02.	Basic Sciences	BS	18	17
03.	Maths	MT	13	10
04.	Basic Engg.	BE	28	26
05.	Core Engg.	CE	90	68
06.	Departmental Electives	DE	09	09
07.	Inter-Departmental Elective	IE	08	08
08.	Project Work	PW	08	08
09.	Industrial Training	IT	02	02
	Total		**190**	**160**

B.Tech. (EIE) – I SEMESTER
EUREG 101: ENGINEERING ENGLISH-I

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EUREG 101	HS	4	---	3	60	40	3

UNIT – I

Introduction to Communication: Role and Importance of Communication, Features of Human Communication. Process of Communication, Types of Communication: Verbal and Non-Verbal. Importance of Listening in Effective Communication and Barriers to Communication.

UNIT – II

Effective Vocabulary: Words Often Confused, One-word Substitutes, Idiomatic Usage, Using Dictionary and Thesaurus .

UNIT – III

Functional Grammar: Functions: Making proposals, Offering suggestions, Apologizing, Requesting, Offering and Refusing help, Giving and asking for information, Making complaints, Interrupting, Giving and asking directions, Inviting, Asking Permission, Expressing ability, etc., Articles, Prépositions, Tenses and Concord.

UNIT – IV

Communication through Writing: Paragraph writing: Communication through letters: official and personal letters, letters of complaint, letters of enquiry and responses. Résumé writing, Cover letters, E-mail etiquette and Punctuation.

UNIT – V

Reading for Enrichment
Sachin Tendulkar, Michael Jackson.

Text Book:
1. E. Suresh Kumar et al., Enriching Speaking and Writing Skills, Orient Blackswan, 2012.

Reference Books:
1. E. Suresh Kumar et al., Communication Skills and Soft Skills, Pearson, 2010.
2. Oxford Advanced Learners' Dictionary, 2010 Edition.

B.Tech. (EIE) – I SEMESTER
EURMT 102: ENGINEERING MATHEMATICS

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be Awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURMT 102/ EIRMT 102	MT	4	---	3	60	40	4

UNIT-I

First order Differential Equations

Formation – Variables seperable – Homogeneous, non Homogeneous, Linear and Bernoulli equations. Exact equations - Applications of first order differential equations – Orthogonal Trajectories, Newton's law of cooling, law of natural growth and decay.

UNIT-II

Higher order Differential Equations

Complete solutions - Rules for finding complementary function - Inverse operator - Rules for finding particular integral - Method of variation of parameters - Cauchy's and Legendre's linear equations - Simultaneous linear equations with constant coefficients - Applications of linear differential equations to Oscillatory Electrical circuits L-C, LCR – Circuits - Electromechanical Analogy.

UNIT-III

Mean Value Theorems

Rolle's, Lagrange's and Cauchy's mean value theorems. Taylor's and Maclaurin's theorems and applications (without proofs).

UNIT-IV

Infinite Series

Definitions of convergence, divergence and oscillation of a series - General properties of series - Series of positive terms - Comparison tests - Integral test - D' Alembert's Ratio test - Raabe's test - Cauchy's root test - Alternating series - Leibnitz's rule - Power series - Convergence of exponential, Logarithmic and binomial series (without proofs).

UNIT-V

Linear Algebra

Rank of a Matrix – Elementary Transformations – Echelon form - Normal form (self study). Consistency of Linear system of equations A X = B and A X = 0. Eigen Values and Eigen Vectors – Properties of eigen values(without proofs) – Cayley – Hamilton theorem (Statement only without proof) – Finding inverse and powers of a square matrix using Cayley – Hamiton theorem – Reduction to diagonal form – Quadratic form - Reduction of Quadratic form into canonical form – Nature of quadratic forms.

Text Books

1. Higher Engineering Mathematics, Dr.B.S Grewal, Khanna Publishers.

References

1. Advanced Engineering Mathematics, Erwin Kreyszig.Wiley Eastern Pvt. Ltd.
2. Textbook of Engineering Mathematics, N.P.Bali. Laxmi Publications (P) Ltd.
3. Higher Engineering Mathematics, Dr.M.K.Venkata Raman. National Pub.Co.
4. Calculus and Analytic Geometry Thomas / Finney Sixth edition -Narosa Publishing House

EURPH 103: ENGINEERING PHYSICS – I

Code No.	Category	Scheme of instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURPH 103	BS	4		3	60	40	4

The aim of the course is to impart knowledge in basic concepts of Physics relevant to Engineering applications.

UNIT - I

Thermodynamics: Heat and Work - First Law of Thermodynamics and Applications - Reversible and Irreversible Processes - Carnot's Cycle and Efficiency - Second Law of Thermodynamics - Carnot's Theorem - Entropy - Entropy in Reversible and Irreversible Processes - Entropy and Second Law - Entropy and Disorder - Third Law of Thermodynamics.

UNIT - II

Electromagnetic Oscillations And Alternating Currents: Energy Stored in a Capacitor and an Inductor - LC Oscillations (Qualitative and Quantitative) - Analogy to Mechanical Motion-Damped Oscillations - Damped Oscillations in an RLC Circuit - Alternating Current (Including Equations for Voltages and Currents) - Fundamental Definitions - (Cycle, Time period, Frequency, Amplitude, Phase, Phase Difference, Root Mean Square (RMS) value, Average Value, Form Factor, Quality Factor, Power in Alternating Current Circuits) - Forced Oscillations and Resonance - The Series RLC Circuit.

Electromagnetic Waves: Induced Magnetic Fields - Displacement Current - Maxwell's Equations - Traveling Waves and Maxwell's Equations - The Poynting Vector - Light and the Electromagnetic Spectrum.

UNIT-III

Dielectric Properties: Introduction - Fundamental Definitions - Local Field - Claussius-Mossotti Relation -Different Types of Electric Polarizations (electronic, ionic, and dipolar polarizations) - Frequency and Temperature Effects on Polarization - Dielectric Loss - Dielectric Breakdown - Determination of Dielectric Constant - Properties and Different Types of Insulating Materials - Ferroelectric Materials - Spontaneous Polarization in $BaTiO_3$ - Electrets.

UNIT-IV

Magnetic Properties: Introduction - Fundamental Definitions - Different Types of Magnetic Materials - Weiss Theory of Ferromagnetism - Domain Theory of Ferromagnetism – Hysteresis - Hard and Soft Magnetic Materials - Ferrites - Microwave Applications - Magnetic Bubbles.

UNIT-V

Superconductivity: Introduction - BCS Theory - Meissner Effect - Properties of Superconductors - Type-I and Type-II Superconductors - High T_c Superconductors - Applications.

Ultrasonics: Introduction - Production of Ultrasonics by Magnetostriction and Piezo-electric Effects - Detection and Applications of Ultrasonics.

Text Books

1. Physics Part I & II Resnick, Halliday, Krane. John Wiley & Sons.
2. Engineering.Physics, P.K.Palani samy. Scitech Publications (India) Pvt Ltd., Chennai

Reference Books

1. Heat, Thermodynamics, and Statistical Physics Agarwal, Singhal, Satya Prakash. Pragati Prakashan, Meerut.
2. Solid State Physics, S.O.Pillai. New Age International (P)Limited, New Delhi.
3. Materials Science M. Arumugam. Anuradha Agencies, Kumbhakonam.
4. A Text Book of Engg. Physics, Kshirsagar & Avadhanulu. S.Chand and Co.
5. The Feynman Lectures on Physics, Addison-Wesley.

B.Tech. (EIE) – I SEMESTER
EURCH 104: ENGINEERING CHEMISTRY-I

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURCH 104	BS	4	---	3	60	40	4

UNIT – I

Water Technology - Sources and Purification Of Water: Sources of Water – Impurities in Water- Hardness of Water – Temporary and Permanent Hardness- Units.Municipal Water treatment- Sedimentation – Coagulation–Filtration- Sterilisation - Desalination of Brackish Water - Reverse Osmosis and Electrodialysis.

UNIT – II

Water Technology-Softening Methods and Boiler Troubles: Industrial Water treatment- Lime - Soda Ash Method - Chemical reactions –Problems - Zeolite and Ion exchange processes. Boiler Troubles – Boiler corrosion- Scale and Sludge formation - Caustic Embrittlement-Priming and Foaming – Internal conditioning methods like – phosphate, carbonate conditioning.

UNIT – III

Surface Chemistry and Nanochemistry: Colloids: Types of Colloids – Preparation of Colloidal solutions – Micelles – Applications of Colloids
Adsorption: Classification – Adsorption of Gasses on solids - Applications of Adsorption
Nanochemistry: Introduction – Wet chemical methods of preparation (Microemulsion, Sol-gel and Co-precipitation).

UNIT – IV

Polymers: Types of Polymerization– Mechanism of addition polymerization- Moulding constituents and Moulding techniques.Differences between Thermo Plastic and Thermosetting Resins. Preparation and Properties of Polyethylene, PVC, Polystyrene, Polyamides (Nylon-6:6), Polycarbonates and Bakelite - Engineering applications of Plastics, Poly Siloxanes, Polyphosphines**.**

UNIT – V

Engineering Material Science: Refractories:– Classification - criteria of a good refractory. Preparation and properties of silica, magnesite and silicon carbide refractories - clay bond, silica nitride bond and self bond in silicon carbide.
Glass: – Manufacture of glass – types of glasses- Soft glass – hard glass and pyrex glass.
Ceramics: – Structural clay products, white wares and Chemical stone wares.
Cement: Chemical composition of Portland cement, Manufacture- Setting and Hardening of Cement.

Text Books
1. Engineering Chemistry, P.C. Jain and M. Jain,Dhanapat Rai & Sons, Delhi.
2. Engineering Chemistry, B.K.Sharma. Krishna Prakashan,Meerut.
3. A Textbook of Engineering Chemistry, Sashi Chawla.Dhanapath Rai & Sons, Delhi.
4. Text Book of NanoScience and NanoTechnology , by B.S. Murthy and P.Shankar, University Press.

Reference Books
1. A Textbook of Engineering Chemistry,S.S.Dara.S.Chand & Co. New Delhi.
2. Material Science and Engineering,V.Raghavan,Prentice-Hall India Ltd.

B.Tech. (EIE) – I SEMESTER
EURCS 105: PROGRAMMING with C

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS 105	BE	3	---	3	60	40	3

UNIT – I

Algorithm, flowchart, program development steps, structure of C program, Compilers, Linker, Preprocessor, identifiers, basic data types and sizes, Constants, variables, operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Input-output statements, statements and blocks, programming examples.

UNIT – II

Control Structures: if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels.

Designing structured programs, Functions, basics, parameter passing, block structure, user defined functions, standard library functions, recursive functions, Comparison of Iteration and Recursion, header files, C preprocessor, storage classes- extern, auto, register, static, scope rules, example c programs.

UNIT – III

Arrays: concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays.

Pointers: concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments, c program examples.

UNIT – IV

Strings: What are Strings, Arrays of Strings and Standard Library String Functions.

Derived types: structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

UNIT – V

Input and output - concept of a file, , File Structure , text files and binary files, streams, standard I/O, Formatted I/O, file I/O operations, error handling, C program examples.

Text Books

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.

Reference Books

1. MASTERING C, byK R Venugopal, S R Prasad published by Tata McGraw Hill
2. Programming with ANSI and Turbo C by Ashok N. Kamthane, published by PEARSON Education.
3. Let us C by Yashwant Kanetkar, published by BPB Publications.

B.Tech. (EIE) – I SEMESTER
EURPH 112: ENGINEERING PHYSICS LAB

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURPH 212/112	BS	---	3	3	--	100	2

The main aim of the course is to acquaint the students with basic concepts of Engineering physics using the following illustrative list of experiments.

1. J – by Callender and Barne's Method.
2. Thermal Conductivity of a Bad Conductor – Lee's Method.
3. Magnetic Field Along the Axis of a Circular Coil Carrying Current – Stewart and Gee's Galvanometer.
4. Hall Effect- Measurement of Hall Coefficient.
5. Carey Foster's Bridge – Laws of Resistance and Specific Resistance.
6. Calibration of Low Range Voltmeter – Potentiometer Bridge Circuit.
7. Thickness of a Paper Strip- Wedge Method.
8. Newton's Rings – Radius of Curvature of a Plano Convex Lens.
9. Diffraction Grating – Normal Incidence.
10. Determination of Refractive Indices (o and e) of a Bi-Refringent Material (Prism).
11. Cauchy's Constants – Using a Spectrometer.
12. Dispersive Power of a Prism – Using a Spectrometer.
13. Determination of Rydberg Constant.
14. LASER – Diffraction.
15. Determination of Band Gap in a Semiconductor.
16. Optical Fibres – Numerical Aperture and Loss of Signal.
17. VI Characteristics of a pn-junction diode
18. Response of a series RLC Circuit

B.Tech. (EIE) – I SEMESTER
EURCS 113: PROGRAMMING LAB WITH C

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS 113	BE	---	3	3	--	100	2

1. a) Write a C program to ask the user to enter one char (Upper-Case letter) check whether user entered a Upper-case letter or not(by using relational and logical operators) and then if user has entered a Upper-case letter convert into a Lower-case letter? (hint: Upper-case means capital letters, use ASCII information to check for Upper-case and convert).

    b) Write a C program to ask the user to enter two integers and apply all arithmetic operations on those print the corresponding values?(hint : +,-,*,/,%)

    c) Write a C program to Determine the ranges of char, short, int and long int variables both signed and unsigned

    (i) By using size of operator (ii) By printing appropriate values from standard header (limits.h)

2. a) Write a Program to Find the Roots of a Quadratic Equation using if else and Switch statements.

    b) Write a Program which Generates One Hundred Random Integers in the Range of 1 To 100, store them in an array and then prints the average. Write three versions of the program using Different Loop Constructs.

3. a) Write a C program to find the sum of individual digits of a positive integer.

    b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

    c) Write a C program to calculate the following

    $$Sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$$

4. a) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

    b)Write C programs that use both recursive and non-recursive functions

    i) To find the factorial of a given integer.

    ii) To find the GCD (greatest common divisor) of two given integers.

24

iii) To solve Towers of Hanoi problem.

5. a) Write a C program to find both the largest and smallest number in a list of integers.

   b) Write a program to read set of elements in the array and sort them in ascending order.

   c) Write a C program that uses functions to perform the following:
      i) Addition of Two Matrices
      ii) Multiplication of Two Matrices
      iii) Transpose of a given Matrix

6. a) Write a C program that uses functions to perform the following operations:
      i) To insert a sub-string in to given main string from a given position.
      ii) To delete n Characters from a given position in a given string.

   b) Write a C program to determine if the given string is a palindrome or not

   c) Given an Array of Strings Write a Program to Sort the String in Dictionary Order.

7. Write a C program that uses functions to perform the following operations:
      i) Reading a complex number
      ii) Writing a complex number
      iii) Addition of two complex numbers

8. Write a C program that uses functions to perform the following operations:
   a) Count number of characters, words in a file.

   b) Write a C program to reverse the first n characters in a file.
   (Note: The file name and n are specified on the command line.)

   c) Write a C program which copies one file to another.

9. Write a program to print the details of employees of a organization like (Name, Date of Join, Salary) using nested structures.

10. Construct a program for managing membership of library using structures. Write a program that accepts the, code number and duration of books borrowed and displays the name and other information of all those members having dues.

B.Tech. (EIE) – I SEMESTER
EURME215: ENGINEERING GRAPHICS PRACTICE

Course code	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURME 115/215	BE	---	3	3	--	100	2

1. Introduction to AutoCAD, Beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, Coordinate systems (Cartesian ,polar and relative co-ordinate system)
2. Introduction to draw commands – line, circle, rectangle, polygon etc.
3. Introduction to modify commands – extend, trim, chamfer, rotate, etc.
4. Introduction to dimensioning and object properties
5. Engineering Curves – Conics –general method, cycloid, epicycloids, hypocycloid, involutes.
6. Projection of planes
7. Sections and sectional views of solids – prism, pyramid, cylinder, co
8. Developments of solids- prism, pyramid, cylinder, cone.
9. Intersection of solids- prism to prism, cylinder to cylinder

EUREG 201: ENGINEERING ENGLISH-II

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EUREG 201	HS	4	---	3	60	40	3

UNIT – I

Interpersonal Communication:

Introduction to Interpersonal Communication, Models of Interpersonal Relationship Development, Team Work and Persuasion Techniques

UNIT – II

Spoken Communication:

Importance of spoken communication, Basics of Spoken English Situational Dialogues, Speech Making: Formal and Informal.

UNIT – III

Developing Vocabulary and Correcting Common Errors:

Homonyms, Homophones and Homographs, Synonyms and Antonyms: Oral and Written.

UNIT – IV

Information Transfer:

Using charts, Figures, Tables, Pictograms, Maps, Note Making and Note Taking.

UNIT – V

Reading for Enrichment:

Sir Mokshagundam Visvesvaraya

Steve Jobs: The Early Years

Text Book:

1. E. Suresh Kumar et al., Communication for Professional Success, Orient Blackswan, 2012.

Reference Books:

1. E. Suresh Kumar et al., Communication Skills and Soft Skills, Pearson, 2010.
2. Oxford Advanced Learners' Dictionary, 2010 Edition.

EURMT202/EIRMT 202: HIGHER ENGINEERING MATHEMATICS – I

Category	Scheme of Instruction		Scheme of Examination			Credits
	Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
	L/T	D/P		Sem. End Exam	Con. Eval.	
MT	3+1	---	3	60	40	3

UNIT-I

Partial Differentiation-1: Introduction to Partial differentiation - Total derivative - Differentiation of implicit functions - Geometrical interpretation - Tangent plane and normal to a surface - Change of variables - Jacobians.

UNIT-II

Partial differentiation-2: Taylor's theorem for functions of two variables. Total differential - Maxima and minima of functions of two variables - Lagrange's method of undetermined multipliers - Differentiation under the integral sign, Leibnitz's Rule.

UNIT-III

Fourier Series: Euler's formulae - Conditions for a Fourier expansion - Functions having points of discontinuity - Change of interval - Odd and even functions - Expansions of odd or even periodic functions - Half range series and practical Harmonic Analysis

UNIT-IV

Partial differential equations: Formation of partial differential equations - Solutions of a partial differential equation - Equations solvable by direct integration - Linear equations of the first order - Non-linear equations of the first order - Homogeneous linear equations with constant coefficients - Rules for finding the complementary function - Rules for finding the particular integral.

UNIT-V

Applications of Partial Differential Equations: Method of separation of variables – partial differential equations – wave equation – one dimensional heat flow – two-dimensional heat flow-solution of Laplace equation –Laplace equation in polar co-ordinates.

Text Books :
1. Higher Engineering Mathematics, Dr.B.S Grewal,Khanna Publishers.

References :
1. Advanced Engineering Mathematics, Erwin Kreyszig.Wiley Eastern Pvt. Ltd.
2. Textbook of Engineering Mathematics, N.P.Bali.Laxmi Publications (P) Ltd.
3. Higher Engineering Mathematics, Dr.M.K.Venkata Raman. National Pub.Co.

EURMT203/EIRMT 203: HIGHER ENGINEERING MATHEMATICS – II

Category	Scheme of Instruction		Scheme of Examination			Credits
	Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
	L/T	D/P		Sem. End Exam	Con. Eval.	
MT	3+1	---	3	60	40	3

The objective of the course is to impart knowledge in Basic concepts of Mathematics relevant to Engineering applications.

UNIT-I

Multiple Integrals-I: Double integrals- Change of order of integration, Double integrals in Polar coordinates- Areas enclosed by plane curves,

UNIT-II

Multiple Integrals-II : Triple integrals - Volume of solids - Change of variables - Area of a curved surface. Beta and Gamma functions – Properties - Relation between beta and gamma functions – Dirichlet's integrals of type I and type II.

UNIT-III

Vector Differentiation: Scalar and vector fields - Gradient, Divergence and Curl - Directional derivative – Identities - Irrotational and Solenoidal fields.

UNIT-IV

Vector Integration: Line, Surface and Volume integrals - Green's theorem in the plane - Stoke's and Gauss divergence theorems - Introduction of orthogonal curvilinear co-ordinates, Cylindrical co-ordinates and Spherical polar co-ordinates (self study)

UNIT-V

Laplace transforms: Transforms of elementary functions - Properties of Laplace transforms - Existence conditions - Inverse transforms - Transforms of derivatives and integrals - Multiplication by t^n - Division by t - Convolution theorem. Applications to ordinary differential equations and simultaneous linear equations with constant coefficients - Unit step function - Unit impulse function - Periodic functions.

Text Books
1. Higher Engineering Mathematics, Dr.B.S Grewal, Khanna Publishers.

References :
1. Advanced Engineering Mathematics, Erwin Kreyszig. Wiley Eastern Pvt. Ltd.
2. Textbook of Engineering Mathematics, N.P.Bali, Laxmi Publications (P) Ltd.
3. Higher Engineering Mathematics, Dr.M.K.Venkata Raman. National Pub. Co.

EURPH 204: ENGINEERING PHYSICS – II

Category	Scheme of instruction		Scheme of Examination			Credits to be awarded
	Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
	L/T	D/P		Sem. End Exam	Con. Eval.	
BS	3+1	---	3	60	40	3

UNIT – I

Interference: Introduction - Interference in Thin Films - Wedge Shaped Film - Newton's Rings - Lloyd's Mirror - Michelson's Interferometer and Applications.

Diffraction: Introduction - Differences between Fresnel and Fraunhofer Diffractions - Single Slit Diffraction (Qualitative and Quantitative Treatment) - Differences between Interference and Diffraction - Gratings and Spectra-Multiple Slits - Diffraction Grating - X-ray Diffraction - Bragg's Law.

UNIT – II

Polarisation: Introduction - Double Refraction - Negative Crystals and Positive Crystals - Nicol's Prism - Quarter Wave Plate and Half Wave Plate - Production and Detection of Circularly and Elliptically Polarised Lights.

Lasers: Introduction - Spontaneous and Stimulated Emissions - Population Inversion – Ruby Laser - He-Ne Laser - Semiconductor Laser – Applications.

UNIT – III

Modern Physics (Quantum Physics): Matter Waves - Heisenberg's Uncertainty Principle - Schrodinger's Time Independent Wave Equation - Physical Significance of Wave Function (ψ) - Application to a Particle in a one Dimensional Box (Infinite Potential Well) - Free Electron Theory of Metals - Band Theory of Solids (qualitative) -Distinction between Metals, Insulators and Semiconductors - Elementary Concepts of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics (No Derivation).

UNIT – IV

Semiconductors: Introduction - Intrinsic and Extrinsic Semiconductors - Carrier Concentration in Intrinsic Semiconductors - Carrier Concentration in n-Type Semiconductors - Carrier Concentration in p-Type Semiconductors - Hall Effect and Applications -Variation of Carrier Concentration with Temperature - Conductivity of Extrinsic Semiconductor - PN Junction - Forward Bias - Reverse Bias -VI Characteristics of a PN Junction - Fundamentals of LED, LCD - Photovoltaic Cell (Solar Cell).

UNIT – V

Fibre Optics: Introduction - Optical Paths in Fibre - Optical Fibre and Total Internal Reflection - Acceptance Angle and Cone of a Fibre - Fibre Optics in Communications - Applications.

Nanoscience: History – Definition - Size Dependent Properties (Qualitative): Mechanical and Electrical - Growth Techniques: Top Down (PVD, Ball Milling) - Bottom Up (Sol-Gel and Co-Precipitation) - Applications.

Text Books :
1. Physics part I & II, Resnick, Halliday, Krane. John Wiley & Sons.
2. Applied.Physics, P.K.Palani samy. Scitech Publications (India) Pvt Ltd., Chennai

Reference Books:
1. Modern Physics ,Arthur Beiser.Tata Mc Graw-Hill.
2. Solid State Physics ,S.O.Pillai. New Age International (P)Limited, New Delhi.
3. Materials Science,M. Arumugam. Anuradha Agencies, Kumbhakonam.
4. A Text Book of Engg. Physics, Kshirsagar & Avadhanulu. S.Chand and Co.
5. The Feynman Lectures on Physics ,Addison-Wesley.

B.Tech. (EIE) – II SEMESTER
EURCH 205:ENGINEERING CHEMISTRY-II

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCH205	BS	3+1	---	3	60	40	3

UNIT-I

Non-conventional energy sources and applications: Chemical: Electrode Potential –Determination of Single Electrode Potential-Reference Electrodes – Hydrogen and Calomel Electrodes.Electrochemical Series and its Applications. Primary Cell–Dry or Leclanche Cell, Secondary Cell – Lead acid storage Cell – Ni – Cd, Li batteries , Fuel Cell–Hydrogen-Oxygen Fuel Cell.Methyl alcohol – Oxygen, Propane – Oxygen fuel cell. Solar : Photoelectric cells –Applications of Solar Cells

UNIT-II

Corrosion Engineering: Definition of Corrosion, Theories of Corrosion –Dry Corrosion and Electro Chemical Corrosion. Factors Affecting Corrosion- Nature of the Metal and Nature of the Environment. Prevention of Corrosion: Metallic Coatings –Galvanising and Tinning, Anodized Coatings, Cathodic Protection-Inhibitors, Organic Coatings-Paints –Characteristics, Constituents and their functions, Varnishes.

UNIT-III

Fuel Technology: Calorific value and solid fuels: Classifications of Fuels – Characteristics of Fuels- Calorific Value - Units. Determination – Bomb Calorimetric Method- Dulong's formula. Solid Fuels–Coal, Classification of Coal by Rank-Analysis of Coal –Proximate and Ultimate Analysis. Coke: Manufacture of Coke- Beehive oven and Otto Hoffmann's by product Oven processes.

UNIT-IV

Fuel Technology: Liquid fuels: Refining of Petroleum - Petroleum products used as Fuels - Gasoline - Knocking and Octane Number of Gasoline, Synthetic Petrol –Bergius and Fishcher Tropsch methods. Diesel - Cetane Number, High speed and low speed Diesel oil.- Power Alcohol: Manufacture, Advantages and Disadvantages - LPG.

UNIT-V

Lubricants: Classification-Properties- Viscosity and Oiliness, Flash and Fire -

Points, Cloud and Pour - Points. Aniline point, Saponification number – Carbon residue, Emulsification number volatilities, precipitation number, specific gravity, neutralization number. Principles and Mechanism of Lubrication - Fluid Film, Boundary and Extreme - Pressure Lubrications.

Text Books :
1. Engineering Chemistry,P.C. Jain and M. Jain,Dhanapat Rai & Sons, Delhi.
2. Engineering Chemistry, B.K.Sharma. Krishna Prakashan, Meerut.
3. A Textbook of Engineering Chemistry, Sashi Chawla,Dhanapath Rai & Sons, Delhi.

Reference Books :
1. Textbook of Engineering Chemistry,S.S.Dara,S.Chand & Co. New Delhi.
2. Material Science and Engineering, V.Raghavan. Prentice-Hall India Ltd.

B.Tech. (EIE) – II SEMESTER
EURCS 206: OBJECT ORIENTED PROGRAMMING WITH C++

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS206	BE	3	---	3	60	40	3

UNIT-I

Introduction to OOPS: Origins of C++, Object Oriented Programming, Headers & Name Spaces,Applications of OOP, Structure of C++ Program.

C++ Basics: Keywords, Constants, Data Types, Dynamic Initialization of Variables, Reference Variables, Operators in C++.

C++ Class Overview: Class Definition, Objects, Class Members, Access Control, Class Scope.

UNIT-II

Dynamic memory allocation and deallocation (new and delete), Parameter passing methods, static class members, Arrays of Objects, Objects as Function Arguments, Default Arguments, Const Arguments, Inline functions,Function Overloading, Friend Functions,this pointer,pointers to data members and member function.

UNIT-III

Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic initialization of Objects, Copy Constructors, Dynamic Constructors, Destructors.

Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes.

UNIT-IV

Introduction to pointers, Pointers to Objects, Pointers to Derived Classes, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions,Virtual Destructors, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators.

Files in C++: File I/O, Unformatted and Binary I/O, file handling library functions.

UNIT-V

Templates: Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Member Function Templates.

Exception Handling: Basics of Exception Handling, Types of exceptions, Exception Handing Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions.

Text Book:

1. Computer Science : A Structured Approach Using C++ second edition, Behrouz A. Forouzan and Richard F. Gilberg

Reference Books:

1. Object Oriented Programming in C++ by E.Balagurusamy., published by Tata McGraw-Hill.
2. Object- Oriented Programming with ANSI and Turbo C+ + , 1/eBy Ashok Kamthane
3. Problem Solving, Abstraction, and Design using C++ (6TH 11)Frank L. Friedman

EURCS 213: OBJECT ORIENTED PROGRAMMING LAB WITH C++

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURCS 213	BE	---	3	3	--	100	2

1. Write a CPP program that contains a function to exchange values of two arguments(swap) by using pointers and reference parameters.

2. Write a CPP program to find the given string is palindrome or not. Declare private member function to find palindrome of the given string and access it using public member function.

3. Write a CPP program to find transpose of 2D matrix and allocate memory dynamically to the matrix using dynamic memory allocation. Initialize and display contents of the matrix and deallocate memory.

4. Write a CPP program to add two polynomials of any degree using object as function arguments. Hint: create two objects each represent one polynomial equation.

5. Write a CPP program to add corresponding elements of two 2D matrices using friend function. Create two classes each capable of storing one 2D matrix. Declare the matrix under private access specifier and access them outside the class.

6. Write a program to find total and average marks of each student in class. Create a student class with student number, name, 6 subject marks as its members and initializes the details. Use friend class that access the details of student and calculates total, average marks and prints the result.

7. Write a program to add two matrices of same copy. Create two objects of the class and each of which refers one 2D matrix. Use constructor to allocate memory dynamically and use copy constructor to allocate memory when one array object is used to initialize another.

8. Write a Program to Generate Fibonacci Series by using Constructor to Initialize the Data Members.

9. Write a program for finding area of different geometric shapes (circle, Rectangle, cube). Use function overloading with type, order, sequence of arguments to find the area of shapes.

10. Write a program which prompts the user to enter a string and returns the length of the longest sequence of identical consecutive characters within the string using pointers to data members and member function. For example, in the string "aaaAAAAAjjB", the longest sequence of identical consecutive characters is "AAAAA".

11. Write a program to calculate gross and net pay of employee from basic salary. Create employee class which consists of employee name, emp_id, basic salary as its data members. Use parameterized constructor in the derived class to initialize data members of the base class and calculate gross and net pay of the employee in the derived class.

12. Write a program to calculate bonus of the employees. The class master derives the information from both admin and account classes which intern derives information from class person. Create base and all derived classes having same member functions called getdata, display data and bonus. Create a base class pointer that capable of accessing data of any class and calculates bonus of the specified employee. (Hint: Use virtual functions)

13. Write a program to add two matrices of mxn size using binary operator overloading.

14. Write a program to find transpose of a given matrix of mxn size using unary operator overloading.

15. Write a program to concatenate one string to another using binary operator overloading.

16. Write a program that uses functions to perform the following operations:
   a) To copy contents of one file into another file.
   b) To replace a word with other word in a given file?
   c) To count the no of occurrences of a word in a given file

17. Write a program to sort a given set of elements using function template.

18. Write a program to search a key element in a given set of elements using class template.

19. Write a program to find average marks of the subjects of a student. Throw multiple exceptions and define multiple catch statements to handle division by zero as well as array index out of bounds exceptions.

20. Write a program to find factorial of a given number. Throw multiple exceptions and define multiple catch statements to handle negative number andout of memory exception. Negative number exception thrown if given number is negative value and out of memory exception is thrown if the given number is greater than 20.

B.Tech. (EIE) – II SEMESTER
EURCH 214: ENGINEERING CHEMISTRY LAB

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCH 114/214	BS	---	3	3	--	100	2

The objective of the Laboratory Practicals is to make the student to acquire the basic Concepts on Engineering Chemistry.

1. Calibration of Volumetric Apparatus.
2. Determination of sodium carbonate in soda ash.
3. Estimation of Iron as Ferrous Iron in an Ore Sample.
4. Estimation of Calcium on Portland cement.
5. Estimation of volume strength of Hydrogen Peroxide.
6.   a) Estimation of Active Chlorine Content in Bleaching Power.
       b) Determination of Hardness of a Ground Water Sample.
7. Determination of Chromium (VI) in Potassium Dichromate
8. Determination of Copper in a Copper Ore.
9.   a) Determination of Viscosity of a Liquid.
       b) Determination of Surface Tension of a Liquid.
10.   a) Determination of Mohr's Salt by potentiometric method.
       b) Determination of Strength of an acid by pH metric method.

B.Tech. (EIE) – II SEMESTER
EUREE 217: ELECTRICAL & ELECTRONIC WORKSHOP LAB

Category	L	T	P	Total hours	Marks			Credits
					Con. Eval.	End exam	Total	
BE	-	-	3	3	100	--	100	2

List of Experiments

1.	a. Study of Electrical Symbols b. Study of Electrical Components
2.	a. One way Control of a Lamp b. Two way Control of a Lamp
3.	A Lamp controlled from three different places
4.	Study of Cathode Ray Oscilloscope & Signal Generator
5.	Study of Electronics Components with Symbols
6	Tube Light wiring
7	Bread Board connections
8	Half Wave Diode Rectifier
9	Living Room wiring
10	Godown wiring
11	Verification of OHMS law
12	Soldering & De – Soldering Techniques & Precautions
13	Fan wiring
14	Doctors Room wiring
15	Series & Parallel Connections of Lamps (Dim & Bright connections)
16	PCB Design

EUREI 301/ EUREC 301/EUREE 301/EIREC 301: ADVANCED ENGINEERING MATHEMATICS

Category	L	T	P	Total Hrs	C	S	T	Credits	Dept.
MT	4	--	--	3	40	60	100	3	BSH

UNIT –I

Functions of Complex Variables&Applications Analytic functions, Cauchy – Ricmann equations, Harmonic functions, Application to flow problems, Some standard transformations, Conformal mappings, Special confomal mapping

$$(w = z^2, w = e^z, w = z + \frac{1}{z}, w = \cosh\ z).$$

UNIT – II

Complex Integration Cauchy's theorem, Cauchy's integral formulas, Taylors theorem(without proof), Laurents theorem (without proof) Residue theorem, evaluation of real and definite integrals.

UNIT – III

Fourier Transforms: Definition, Fourier integral theorem, Fourier transforms, properties of Fourier transformations, Convolution theorem, Parseval's identity for Fourier transformations, Relation between Fourier and laplace transforms, Fourier transforms of the derivatives of a functions.

UNIT –IV

Difference equations: Introduction – definition – order and solution of difference equations – linear difference equations – rules for finding complementary function- rules for finding Particular Integral – Difference equations reducible to linear form – simultaneous difference equations with constant coefficient.

UNIT – V

z-transforms: z-transform – definition , some standard z-transforms – linearity property – damping rule – some standard results – shifting rules – initial and final value theorems – convolution theorem – evaluation of inverse of transform-application to difference equations.

Text Books :

1. Higher Engineering Mathematics by Dr. B.S.Grewal, Khanna publishers.

Reference Books :

1. Kreyszig E., Advanced Engineering Mathematics , Wiley Eastern.
2. Text Book of Engineering Mathematics by N.P.Bali et.al, Laxmi publications.

B.Tech. (EIE) – III SEMESTER
EUREI 302: THERMAL ENGG. AND FLUID MECHANICS

Category	L	T	P	Total Hrs	C	S	T	Credits	Dept.
BE	3	--	--	3	40	60	100	3	IPE

UNIT-I

Open and closed systems-Thermodynamic properties-Internal energy-enthalpy-Isothermal and adiabatic process- Zeroth law, first law of thermodynamics-applications to open and closed systems-second law of thermodynamics-heat engine-efficiency- heat pump coefficient of performance, concept of entropy. Basic concepts of heat transfer-modes of heat transfer-laws of conduction, convection, and radiation-simple problems.

UNIT-II

Classification, Comparison of two Stroke and Four Stroke Engines, Comparison of SI and CI Engines. Air Cycles- Otto, Diesel, Dual, their Analysis. Valve Timing and Port Timing Diagrams- Efficiencies- Air Standard Efficiency. -carburetors-ignition system-, fuel injector and fuel pump.

UNIT-III

Properties of fluids and fluid statics-density, specific weight, specific volume, specific gravity, viscosity-Newton's law of viscosity-surface tension-real and ideal fluids. Classification of Flows- - Conservation of Mass- Equation of Continuity, Conservation of Momentum- Euler's Equation, Conservation of Energy- Bernoulli's Equation and its Applications, limitation, applications-flow measurement using orifice meter, venturi meter and pitot tube.

UNIT-IV

Impact of jets and turbines-force of jet on stationary and moving plates-force on curved vanes classification of hydraulic turbines-velocity triangles-work done, efficiency, specific speed pelton wheel-reaction turbines-inward and outward flow Francis and Kaplan turbines.

UNIT-V

Reciprocating pumps-types-work done-slip and coefficient of discharge-effect of acceleration and frictional resistance. Centrifugal pumps- classification-velocity triangles-specific speed.

Text Books:
1. A course in Thermodynamics and heat engines by Domkundwar, Dhanpatrai & Sons
2. Engineering Fluid Mechanics by K.L.Kumar, Eurasia publications, 1984.

Reference Books:
1. Engineering Thermodynamics by Nanchand & Bros, C.P.Gupta & R.Prakash, 1977.
2. A text book of Fluid Mechanics and Hydraulic Machines by R.K.Bansal, Laxmi publishers, 1998.

B.Tech. (EIE) – III SEMESTER
EUREI 303: NETWORK THEORY

Category	L	T	P	Total Hrs	C	S	T	Credits
BE	3	0	--	3	40	60	100	3

UNIT-I

DC Circuits: Active elements, passive elements, reference directions for current and voltage, Kirchoff's laws, voltage and current division, Nodal analysis, Mesh analysis, Linearity and superposition, Thevenin's and Norton's theorem, Source transformation, , Concept of Duality.

UNIT-II

DC Transients: Inductor, Capacitor, Source free RL, RC and RLC response, Evaluation of initial conditions, application of Unit-step function to RL, RC and RLC circuits, concepts of Natural, Forced and Complete response.

UNIT-III

Sinusoidal Steady State Analysis: Characteristics of sinusoids, forced response to sinusoidal functions, the complex forcing function, the Phasor, impedance and admittance, nodal and mesh analysis, Application of network theorems to AC circuits, Instantaneous Power, average power, effective values of current and voltage, apparent power and power factor, complex power, parallel resonance, series resonance.

UNIT-IV

Coupled Circuits: Magnetically coupled circuits, DOT convention, Y, Z, H, T-parameters of two port networks, Reciprocity theorem.

UNIT-V

Three Phase Circuit Analysis: – Phasor diagram and power in 3 phase circuit – three phase circuit analysis with star and delta balanced and unbalanced loads – power measurement in 3-phase circuits – star – delta transformation.

Text Books:
1.   Engineering Circuit Analysis, William H. Hayt Jr. and Jack E. Kemmerly, 6th Edition, Tata McGraw Hill, 2004.
2.   Network Analysis, Vanvalkenberg M.E, 3rd Edition, PHI.

Reference Book:
1.   Circuits and Networks, Sudhakar & Syammohan, TMH

B.Tech. (EIE) – III SEMESTER
EUREI 304: ELECTRONIC DEVICES AND CIRCUITS

Category	L	T	P	Total Hrs	C	S	T	Credits
BE	3	0	--	3	40	60	100	3

UNIT-I

Semiconductors: Energy bands, Intrinsic and Extrinsic Semiconductors, Fermi level in semiconductors, Carrier Mobility, Conductivity, The Hall effect, Generation and Recombination of charges, Diffusion, The continuity equation, Injected minority carrier charge, The potential variation within a graded semiconductor.

UNIT-II

Semiconductor Diodes: Band structure of PN Junction, Quantitative Theory of PN Diode, Volt – Amp. Characteristics, Temperature Dependence, Transition and Diffusion Capacitance of PN Junction, Zener Diode, Tunnel Diode, LED, Varactor Diode, Photo Diode.Diode Rectifiers: Half-wave, Full-wave and Bridge Rectifiers, types of Filters, Capacitor filter, Ripple Factor and Regulation Characteristics.

UNIT-III

Bipolar Junction Transistor: NPN and PNP junction Transistors, Transistor current components, CB, CE and CC Configurations and their Characteristics, Saturation, Cutoff and Active Regions, Comparison of CE, CB and CC Configurations, The Ebers-moll model, Maximum voltage rating, The operating point, Various Biasing Circuits and Stabilization, Bias compensation, Thermal Runaway, Thermal Stability, Transistor Hybrid model, The h parameters of the three transistor configurations, High frequency model of a Transistor. Introduction to UJT & SCR.

UNIT-IV

Small Signal – Low Frequency Transistor amplifier Circuits: Transistor as an Amplifier, Analysis of Transistor Amplifier Circuits using h – parameters,

Linear analysis of a Transistor circuit, Miller's theorem and it's dual, Simplified CE and CC hybrid models, The CE amplifier with emitter resistance, Darlington pair, Analysis of Single Stage Amplifiers.

UNIT-V

Field Effect Transistors: JFET and its characteristics, Pinch off Voltage, Drain Saturation Current, Small signal model of FET, MOSFET – Enhancement and Depletion Modes, The low frequency common source and common drain amplifiers, Biasing the FET, The FET as VVR.

Text Book:

1.   Integrated Electronics Analog and Digital Circuits, Jacob Millman and Christos C. Halkias, McGraw Hill.

Reference Books:
1.   Electronic Devices and Circuits – RL Boylestad & Louis Nashelsky, Pearson Education.
2.   Electronic Devices & Circuits, Dharma Raj Cheruku & B T Krishna, Pearson Education, 2005.

B.Tech. (EIE) – III SEMESTER
EUREI 305: SENSORS AND TRANSDUCERS

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I
Definition of sensor/transducer-Block Diagram-elements of measurement system-classification of sensors/transducers-selection criteria-static characteristics-accuracy, precision, resolution, calibration, linearity, sensitivity, range, span, signal to noise ratio (SNR), hysteresis, loading effect, repeatability, reproducibility, threshold, dead time, dead zone-dynamic characteristics-dynamic response, standard input/test signals, zero order, first order, second order responses for unit step input.

UNIT-II
Resistive transducers: Resistance potentiometer-loading effect-strain gauges-gauge factor-types of strain gauges-rosettes-resistance thermometers-construction, characteristics- thermistors- thermocouples-thermo wells- hot wire anemometer-constant current and constant temperature operation.

UNIT-III
Inductive and capacitive transducers: Basic principle-self-inductance- mutual inductance, LVDT -signal conditioning Unit-methods of null reduction- RVDT-synchros-induction potentiometer-variable reluctance transducer.
Capacitive transducers: Introduction-Variable area type-variable air gap type-variable permittivity type-capacitive level sensor-capacitor microphone-frequency response.

UNIT-IV
Piezoelectric, Hall Effect and Radiation Sensors: Introduction of piezoelectricity- piezoelectric crystals-accelerometer-charge amplifier-Hall Effect transducers-introduction- applications. Basic characteristics of Radiation Sensors-types of photodetectors-photoemissive cell-photovoltaic cell-photo conductive cell-LDR.

UNIT-V
Fiber-optics, Digital and Smart Sensors: Introduction to fiber-optic sensors-

temperature sensors-liquid level sensing-fluid flow sensing-Microbend sensors. Digital Sensors: Introduction to digital encoding transducer- classification-digital displacement transducers- shaft encoder-optical encoder, Bar coding principle. Introduction to Smart Sensors

Text Books:
1. Measurement Systems, Application and design, E.O. Doebelin, Tata McGraw Hill, 2004.
2. Transducers and Instrumentation, D.V.S.Murthy, PHI, 1995.
3. Sensors and Transducers, D.Patranabis, PHI, 2004.

Reference Books:

1. A course in mechanical measurements and instrumentation, A. K. Sawhney & Puneet Sawhney, Dhanpat Rai & Co., 2001.
2. Transducer Engineering, Ranganathan, Allied Publishers, Chennai.

B.Tech. (EIE) – III SEMESTER
EUREI 306: DATA STRUCTURES USING C

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Arrays: Organization and use of one-dimensional arrays, operations, two dimensional and multidimensional arrays – Algorithms of all operations on linear arrays.

UNIT-II

Structures, pointers and files: definition of structures and unions, programming examples; pointers, pointer expression, programming examples; file operations, process.

UNIT-III

Linear Data Structures: Stack representation, operational algorithms, arithmetic expression: polish notation. Queue representation, operations, algorithms, deques, priority queues, circular queues. Linked list representation operations, algorithms, double linked and circular lists.

UNIT-IV

Non-linear Data structures: Tress, Binary tree representation, tree traversals, Huffman's algorithms conversion of general tree to binary tree. Graph representation, Warshall's algorithms, shortest paths, linked representation of a graph, operations of graph, traversing a graph.

UNIT-V

Sorting, Searching: Bubble sort, quick sort, hcap sort Linear search. Binary search. Study of Unix operating system: file system protection, Unix shell programming.

Text Books:
1. Programming in ANSIC – E Balaguruswamy
2. Data Structures using C - A.M. Tanebaum and others

Reference Books:
1. Data Structures – Schaum's outline series.
2. An introduction to data structures with applications – Trembly & Sorenson.

B.Tech. (EIE) – III SEMESTER
EUREI 311: SENSORS AND TRANSDUCERS LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Twelve Experiments should be conducted from the following

1. Response of RTD
2. Response of Thermocouple.
3. Displacement measurement with LVDT.
4. Speed measurement with digital stroboscopic method.
5. Pressure measurement with piezo-resistive transmitter
6. Characteristics of Hall Effect sensor
7. Strain measurement.
8. Capacitive Level sensor for liquid level measurement.
9. Angular displacement measurement
10. Measurement of displacement using Ultrasonic principle.
11. Measurement of flow using Turbine flow meter
12. Characteristics of Synchro trans-receiver
13. Temperature measurement using AD590.
14. Characteristics of Thermistor.

B.Tech. (EIE) – III SEMESTER
EUREI 312: ELECTRONIC DEVICES AND CIRCUITS LAB

Category	L	T	P	Total hrs	C	S	T	Credits
BE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. V-I characteristics of a PN junction diode, Zener Diode & LED.
2. Zener diode Regulator.
3. Half wave Rectifier with and without capacitor filter.
4. Full wave Rectifier with and without capacitor filter.
5. Bridge Rectifier with and without capacitor filter.
6. Characteristics of CB Transistor and its h parameters.
7. Characteristics of CE Transistor and its h parameters.
8. Drain and Transfer Characteristics of JFET.
9. Single stage RC coupled Amplifiers.
10. Introduction to PSPICE – PN junction characteristics, Zener diode characteristics
11. Implementation of Rectifiers using PSPICE
12. Implementation of CE amplifier using PSPICE

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Introductory concepts   Number systems, conversion of bases - binary arithmetic – binary codes weighted and non-weighted codes – Error detecting and error correcting codes. Logic Families: Realization of NAND gate using DTL logic, TTL logic and CMOS logic and their comparison

UNIT-II

Minimization of switching functions: Postulates and theorems - canonical forms of switching functions: SOP and POS forms – Simplification of functions: Karnaugh map and Quine Mc Cluskey methods – prime implicants - minimal functions and their properties – realization of switching functions using minimum no. of gates - multiple output functions

UNIT-III

Design of Combinational Circuits: Symbols and truth tables of logic gates: AND, OR, NOT, NAND, NOR and XOR - design using conventional gates – design using MSI and LSI devices – multiplexers, demultiplexers, decoders and priority encoders – logic design of combinational circuits: ripple carry adder, carry look ahead adder, comparator, seven-segment display, code conversion, binary addition, subtraction, ROM, PLA and PAL.

UNIT-IV

Sequential Machine Fundamentals: Combinational Vs Sequential circuits - memory elements and their excitation functions: basic RS latch, RS, D, JK and T flip-flops – conversion from one flip-flop – Classification of sequential circuits - registers, shift registers – ripple counters, synchronous counters and their design – lock out in counters

UNIT-V

Sequential Circuits: Synchronous Sequential Circuits: Synchronous Vs asynchronous sequential circuits – synchronous sequential circuit design: state diagram, state table, reduction of state table, state assignment, transition and output table, implementation of sequence detectors, binary counter, serial binary adder etc using various flip-flops
Asynchronous Sequential Circuits: Analysis and design of fundamental mode circuits – reduction of flow table – static and dynamic hazards.

Text Books:

1.   Switching and finite automata theory, 2nd Ed, Zvi Kohavi, Tata McGraw-Hill.
2.   Digital Design, Morris Mano, 3rd Edition, PHI Publications.

Reference Books:

1.   Introduction to Switching theory and logic design, 3rd Edition, Frederick J. Hill and Gerald   R. Peterson, John Willey and sons, 1981
2.   Fundamentals of Logic design, 5th Edition, Charles H. Roth Jr. Thomson Pub.

B.Tech. (EIE) – IV SEMESTER
EUREI 402: ELECTRONIC CIRCUITS AND ANALYSIS

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	0	--	3	40	60	100	3

UNIT-I

Multistage Amplifiers: Cascading of Transistor amplifiers, Choice of transistor configuration in cascade, Frequency response of an amplifier, Bandwidth, RC coupled amplifier, Effect of bypass and coupling capacitors, High frequency current gain, Gain Bandwidth product.

UNIT-II

Feedback Amplifiers: Concept of Feedback Amplifiers – Effect of Negative feed back on the amplifier Characteristics. Four Feedback Amplifier Topologies. Method of Analysis of Voltage Series, Current Series, Voltage Shunt and Current Shunt feedback Amplifiers, Design considerations.

UNIT-III

Sinusoidal Oscillators: Condition for oscillations –LC Oscillators – Hartley, Colpitts, Clapp and Tuned Collector Oscillators – Frequency and amplitude Stability of Oscillators – Crystal Oscillators – RC Oscillators -- RC Phase Shift and Wien bridge Oscillators, Design considerations.

UNIT-IV

Multivibrators & Voltage time-base generators: Analysis of Bistable, Monostable & Astable Multivibrators with BJT. Schmitt trigger circuit, Synchronous and Asynchronous triggering. Different voltage sweep circuits, Exponential charging circuit, Miller sweep, Bootstrap sweep.

UNIT-V
Power Amplifiers: Classification of Power Amplifiers – Class A, Class B and Class AB power Amplifiers. Series Fed, Single Ended Transformer Coupled and Push Pull Class A and Class B Power Amplifiers. Cross-over Distortion in Pure

Class B Power Amplifier, Class AB Power Amplifier – Complementary Push Pull Amplifier, Class C Amplifiers, Design considerations – Heat Sinks.

Text Books:
1. Integrated Electronics, Millman and Halkias, TMH, New Delhi,2001
2. Electronic Devices and Circuits, G.K. Mittal, Khanna Publishers, 23rd edition,2004
3. Pulse, Digital and Switching Waveforms, Millman and Taub, TMH.

Reference Books:
1. Electronic Devices and Circuit Theory, Boylstead, PHI, 2000.
2. Electronic Devices and Circuits, Mottershead, Pearson Education.(for Chapter-4)
3. Electronic Devices and Circuits, C.D. Raj, B. T. Krishna, Pearson, 2004.
4. Electronic Devices and Circuits, Sanjeev Gupta Dhanapat Rai Pub.

B.Tech. (EIE) – IV SEMESTER
EUREI 403: ELECTRICAL AND ELECTRONIC MEASUREMENTS

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	0	--	3	40	60	100	3

UNIT-I

Measurement and Error –Classification of instruments-Types of errors – Statistical analysis – linear curve fitting, parabolic curve fitting-Probability of errors – Limiting Errors. Standards of Measurement – Classification of standards – Time and Frequency standards – IEEE standards.

UNIT-II

Electronic Instrumentation: Measurement of basic Parameters: Introduction – PMMC Principle – AC Voltmeter – True RMS responding voltmeter – Electronic Multimeter –Alternating current indicating instruments – Electro dynamometer – Instrument Transformers - Considerations in choosing an Analog voltmeter – Digital voltmeter – 3 ½ and 4 ½ digit - Q-meter – Vector Impedance Meter – Vector Voltmeter.

UNIT-III

Wattmeters and Energy meters:Single phase wattmeters:- Theory of Dynamometer type, Induction type and Electrostatic type wattmeters - comparison between electrodynamometer type and induction type wattmeter – Energy meters - Single phase Induction type watt hour meter – errors and their compensation - measurement of kilo volt amperes.

UNIT-IV

Resistance, Inductance and Capacitance Measurements: Wheatstone bridge, Kelvin Bridge,AC bridges: Maxwell Bridge, Hay Bridge, Schering Bridge, Wien Bridge – Wagner Ground Connection.

UNIT-V

Oscilloscopes and wave analyzers: Block diagram– CRT-multiple trace-Oscilloscope probes –Oscilloscope Techniques – Special Oscilloscopes: Storage, sampling, digital storage oscilloscope. Wave analyzer- Harmonic distortion analyzers- Spectrum Analyzers.

Text Books:

1. Modern Electronic Instrumentation and Measurement Techniques, A.D. Helfrick and W.D. Cooper, PHI.

2. Electrical and Electronic Measurements, A.K.Sawhney, Dhanpat Rai and Co Ltd, 1974.

References:

1. Electronic Instrumentation, H.S.Kalsi, TMH, 2nd Edition

2. Electrical measurements & measuring Instruments – E.W.Golding & F.C.Widdis, Wheeler publishing, Allahabad, 5th edition.

3. Electronic Measurements and Instrumentation, David A Bell, PHI, 2nd edition.

B.Tech. (EIE) – IV SEMESTER
EUREI 404: SIGNALS AND SYSTEMS

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Signals: Signals, Classification of signals, Transformation of independent variables, Basic continuous time signals, Basic discrete time signals, systems, classification of systems, properties of systems.

UNIT-II

LTI systems: Singularity functions, representation of signals in terms of impulses, discrete time LTI system, the convolution sum, continuous time LTI systems, the convolution integral, systems described by differential and difference equations, properties of systems, causality and stability.

UNIT-III

Fourier analysis of continuous time signals and systems: The response of continuous LTI systems to complex exponentials, the continuous time Fourier series, convergence of Fourier series, Aperiodic signals and continuous Fourier transform, periodic signals and continuous Fourier transform, properties of Fourier transform, frequency response characterized by linear constant coefficient differential equation.

UNIT-IV

Fourier analysis for discrete time signals and systems: The response of discrete time LTI systems to complex exponentials, discrete time Fourier series, discrete time Fourier transform, properties of DTFT, frequency response characterized by linear constant coefficient difference equation.

UNIT-V

Laplace and Z-transform Techniques: Introduction to Laplace transform of the signals, waveform synthesis, Laplace Transforms of typical signals, Response to Unit-Step, Ramp and Impulse functions, Initial and Final value theorem, Convolution integral, time shift and periodic functions. Z-Transfer function: Properties of Z-transform, region of convergence, Inverse Z-transform, relation between Z-transform and Fourier transform.

Text Books:

1. Signals and systems, Alan V. Oppenheim, Alan S. Willsky and Ian, Pearson Edu.
2. Signals & Systems, P Ramesh Babu, Scitech

References:
1. Signals & Systems, B P Lathi, B S Publishers
2. Signals & Systems, Nagrath, Sharan, Rajan et. Al, TMH.
3. Signals & Syatems, Sanjay Sarma, S K Kataria

B.Tech. (EIE) – IV SEMESTER
EUREI 405: ENVIRONMENTAL STUDIES

Category	L	T	P	Total hrs	C	S	T	Credits	Dept
HS	4	--	--	4	40	60	100	4	Civil Engg.

UNIT-I

The Multidisciplinary nature of environmental studies – Definition, scope and importance, need for public awareness. Natural Resources: Renewable and non-renewable resources. Natural resources and associated problems – Forest Resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: world food problems, changes caused by agricultural and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies. Land resources: Land as a resources, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable life styles.

UNIT-II

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 ecosystems: Forest ecosystems, Grassland ecosystems, desert ecosystems. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity and its conservation: Introduction: Definition: genetic, species of ecosystem diversity. Bio-geographical 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. Hotspots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III

Environmental Pollution: Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, 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, earthquakes, cyclones and landslides.

UNIT-IV

Social Issues and the environment: From unsustainable to sustainable development. Urban problems related to energy, Water conservation, rain water harvesting and watershed management. Resettlement and rehabilitation of people, its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.

UNIT-V

Human Populations and the Environment, Environmental Protection Act and Field work: Population growth, variation among nations, Population explosion – Family welfare programme. Environment and human health. Human rights, Value education, HIV / AIDS, Women and Child welfare, Role of information technology in environment and human health. Case Studies. Field Work: Visit to 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.

Text Book:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha. Published by – University Grants Commission, Universities Press, India.

B.Tech. (EIE) – IV SEMESTER
EUREI 406: ELECTRICAL MACHINES

Category	L	T	P	Total hrs	C	S	T	Credits	Dept.
BE	3	--	--	3	40	60	100	3	EEE

UNIT-I

DC Machines: Constructional Features, Function of Commutator, Induced EMF and Torque Expressions, Relationship Between Terminal Voltage and Induced EMF for Generator and Motoring Action, Different Types of Excitation and Performance Characteristics of Different Types of DC Machines, Starting and Speed Control of DC Motors, Losses and Efficiency, Efficiency by Direct Loading, Swinburne's Test, Applications of DC Machines.

UNIT-II

Transformers: Constructional Details, EMF Equation, Equivalent Circuit, Voltage Regulation, Losses and Efficiency, Auto – Transformers, Open/Short – Circuit Tests and Determination of Efficiency and Regulation.

UNIT-III

Three – Phase Machines: Induction Machines: Construction, Rotating Magnetic Field and 3 phase Induction Motor, Power Flow Diagram, Torque and Torque-slip Characteristics, Condition for Max. Torque and its value, Starting and Speed Control, Losses and Efficiency.

UNIT-IV

Synchronous Machines: Generation of EMF, Constructional Details, Induced EMF, Synchronous Generator on no Load and Load, Synchronous Impedance and Voltage Regulation. V – Curves and Inverted V – Curves: Synchronous Condenser, Starting of Synchronous Motors, Applications of Synchronous Machines.

UNIT-V

Single – Phase Motors: Double Revolving Field Theory, Methods of Starting Single Phase Induction Motors, split phase type, capacitor start, capacitor run, shaded pole motors, Universal Motor, Stepper Motor.

Text Books:

1. Electrical Machines, S. K. Bhattacharya, TMH Publications, New Delhi, 2003.
2. Electrical Machines, P S Bhimbra, Khanna publishers.

B.Tech. (EIE) – IV SEMESTER
EUREI 411 NETWORKS AND ELECTRICAL MACHINES
LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
BE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. Verification of KVL & KCL.
2. Verification of Superposition Theorem.
3. Verification of Thevenin & Norton theorem.
4. Measurement of Two port parameters (Z & Y).
5. Calibration of Wattmeter.
6. Parameters of Choke Coil.
7. Open circuit and short circuit tests on transformer.
8. Swinburne's test on DC shunt motor.
9. OCC and external characteristics of DC shunt generator.
10. Load test on 3-phase induction motor.
11. Load test on 1 phase induction motor.
12. Regulation of alternator by synchronous impedance method.

B.Tech. (EIE) – IV SEMESTER
EUREI 412 ELECTRONIC CIRCUIT ANALYSIS LABORATORY

Category	L	T	P	Total Hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Twelve Experiments should be conducted from the following
1. RC coupled amplifier: frequency response, calculation of gain and bandwidth
2. Feedback amplifiers: frequency response calculation of gain
3. Calculation of input, output resistance with and without feedback.
4. Colpitts Oscillator.
5. Hartley Oscillator.
6. RC Phase-Shift Oscillator.
7. Wien-Bridge Oscillator.
8. Class A Power Amplifier
9. Class B Push-Pull Power Amplifier.
10. Astable Multivibrator
11. Monostable Multivibrator
12. Bistable Multivibrator
13 Implementation of RC coupled amplifier using PSPICE
14 Implementation of Feedback amplifiers using PSPICE
15. Implementation of Multivibrators using PSPICE

B.Tech. (EIE) – IV SEMESTER
EUREI 413 : MEASUREMENTS LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. Measurement of resistance using Wheat Stone Bridge.
2. Measurement of resistance using Kelvin's Double Bridge.
3. Measurement of inductance using Maxwell's Bridge.
4. Measurement of inductance using Hay's Bridge
5. Measurement of Capacitance using Schering's bridge.
6. Design of Wien Bridge Oscillator.
7. Calibration of Multi range DC Voltmeter.
8. Calibration of Multi range DC Ammeter.
9. Design of Q-Meter.
10. Design of Rectifier type Instrument.
11. Design of Series type Ohmmeter.
12. Measurement of phase difference by CRO using Lissajous figures.

B.Tech. (EIE) – IV SEMESTER
EUREI 414 : INDUSTRIAL TOUR

Category	L	T	P	Total Hrs	C	S	T	Credits
IT	--	--	--	--	--	--	--	Non-credit

- The students will visit core industries like Instrumentation, Automation, Power Plant, Bio-Medical Engg, VLSI etc., or related research establishments.
- The industries to be visited should be from the approved list by the Head of the Department. Industry should be large scale to medium scale.
- At least five industries are to be visited by the student.

- The industrial tour would be a week to 10 days.

- The tour will be organized by the Department in the break between two semesters of their second year of study.
- Each student will have to submit an individual report on the tour for assessment within 10 days of their return from the tour.

B.Tech. (EIE) – V SEMESTER
EUREI 501 MICROPROCESSORS & INTERFACING

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I
Intel 8085 microprocessor: Evolution of microprocessors, Architecture of 8085, Pin diagram of 8085, Addressing modes of 8085, Memory interfacing to8085.

UNIT-II
Architecture of 8086/88 Family: Introduction to Intel 8086/8088 Microprocessors, Architecture, Addressing modes, 8086 flag register, Timing diagrams of Memory Read/Write and I/O Read/Write machine cycles.

UNIT-III
Assembly language programming with 8086: Instruction set of 8086, Assembler directives, Writing and using procedures and assembler macros, Assembly Language program development tools, Simple programs.

UNIT-IV
Memory & I/O Interfacing: 8086-Minimum mode and maximum mode of operation, Memory organization, Addressing memory and ports in microcomputer system, Memory interfacing to 8086(SRAM and EPROM).

UNIT-V
Interrupts and Interfacing: Interrupts of 8086 and interrupt responses, Programmable peripheral interface 8255A, Programmable timer/counter 8253/8254, DMA controller 8237/8257, A/D and D/A converter interfacing and generation of waveforms.

Text Books:
1. Microprocessor Architecture Programming and applications with the 8085, Ramesh S Goankar, Perman International Pvt.Ltd.
2. Advanced Microprocessors and Peripherals, A.K.Ray and K.M.Bhurchandi, 2nd Ed, TMH.
3. Microprocessors and Interfacing: Programming and Hardware, Douglas V Hall, 2nd Ed., TMH.

Reference Books:
1. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd edition.
2. The Intel 8086 Programming, John Uffenbeck, 2nd Ed, PH India.
3. 8086 Micro Processor -Kenneth J. Ayala, Penram International/ Thomson, 1995.
4. Assembly language programming the IBM PC by Alan R. Miller, Sybex Inc 1987.

B.Tech. (EIE) – V SEMESTER
EUREI 502: LINEAR ICS & APPLICATIONS

Category	L	T	P	Total Hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Operational Amplifiers: Concept of Direct Coupled Amplifiers. – Differential Amplifier - Calculation of common mode rejection ratio – Differential Amplifier supplied with a constant current source – Normalized Transfer Characteristics of a differential Amplifier, Ideal Characteristics of an operational Amplifier , Parameters of an Op-Amp, Measurement of Op-Amp Parameters, Frequency Compensation Techniques.

UNIT-II

Operational Amplifier Applications: Linear: Inverting and Non-inverting Amplifiers, Differential Amplifiers, Summing, scaling and Averaging amplifiers, Integrators, Differentiators, Logarithmic Amplifiers, Instrumentation Amplifiers, Voltage to Current and Current to Voltage Converters, Rectifiers, Peak Detectors.
Non-linear: Comparators, Schmitt trigger, Multivibrators, Sine wave oscillators (phase-shift, weinbridge, and Quadrature), Waveform generators (triangular and sawtooth) , Sample and Hold circuits, Analog multiplexers.

UNIT-III

Other Linear IC's: 555 Timers –555 Timer as a Monostable Multivibrator, Monostable Multivibrator Applications: Frequency divider, Linear Ramp generator, 555 Timer as An Astable Multivibrator, Astable Multivibrator Applications: Free running ramp generator, FSK generator. 556 Function Generator ICs, IC 566 Voltage controlled oscillators and IC 565 PLL, PLL Applications: AM/FM detection and Frequency multiplication, Three Terminal IC (Fixed) Voltage Regulators.

UNIT-IV

A/D & D/A Converters: DAC characteristics, D to A conversion process; multiplying DAC, 8 bit D to A converter, microprocessor compatibility, serial DACs, ADC characteristics, A to D conversion process; successive approximation ADC, microprocessor compatibility, ADCs for microprocessors, frequency response of ADCs.

UNIT-V

Active Filters: First-Order LPF, HPF, BPF, BEF, All-pass Butterworth Filters, Second Order LPF, HPF. Higher Order Filters and their Comparison - Switched Capacitance Filters.

Text Books:
1. Op-Amps and Linear Integrated Circuits, Ramakanth Gayakward, Pearson Education, LPE.
2. Op-Amps and Linear Integrated Circuits by R.F Coughlin and F.F Driscoll, Pearson Education, 6th Edn.
3. Operational amplifiers, George Clayton, Steve winder, Newnes, 4th edition.

Reference Books:
1. Microelectronics, Jacob Millman and Arwin. W. Grabel, TMH.
2. Linear Integrated Circuits, Roy Choudary and Vishal.K.Jain, New Age International.
3. Integrated Electronics, Jacob Millman and Christos C. Halkias, Tata McGraw-Hill.

B.Tech. (EIE) – V SEMESTER
EUREI 503 : INDUSTRIAL INSTRUMENTATION - I

Category	L	T	P	Total hrs	S	E	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Metrology: measurement: Length, - plainness- Area-Diameter- Roughness-Angle-Comparators –Gauge blocks –Optical methods of length and distance measurements, Measurement of linear velocity and angular velocity.

UNIT-II

Measurement of speed, acceleration and vibration: speed- Revolution counter, Drag-cup tachometer, stroboscope, AC and DC-tacho-generators, capacitive tachometer, speed measurement using reluctance pick-up, photo-transducer. Acceleration- LVDT, piezo-electric, strain gauge, seismic accelerometer, mechanical vibration instruments, calibration of vibration instruments.

UNIT –III

Measurement of force, torque, and load: Measurement of force-load cell-strain gauges – and LVDT load cells – Pneumatic load cell – hydraulic load cell- Torque measurements using strain gauges and magneto-elastic principle, Basic methods for force measurement- Characteristics of elastic force transducer, piezo-electric transducer, variable reluctance transducer, gyroscopic force and torque measurement.

UNIT –IV

Measurement of Density, Humidity, Moisture: pressure head type densitometer, float type densitometer, ultrasonic densitometer, bridge type gas densitometer, Humidity terms, dry and wet bulb thermometer, dew cell , electrolysis type hygrometer, commercial type dew point meter moisture terms, moisture measurement in paper, kilns.

UNIT –V

Measurement of viscosity, sound, pH: Viscosity- say bolt   viscometer, Rota meter type viscometer, Sound- introduction, sound level meter, microphone- piezo electric-

electret microphone, pressure response of capacitor microphone measurement-pH.

Text Books:
1. Measurement Systems – Applications and Design – by Doeblin E.O., 4/e, McGraw Hill International, 1990.
2. Principles of Industrial Instrumentation – Patranabis D. TMH. End edition 1997
3. Mechnical Measurements and Instrumentation& Contro-by A.K.Sawhney, Puneet Sawhney, Dhanpat rai & Co.
4. Mechanical and Industrial Measurements – by Jain R.K., Khanna Publishers, 1986

Reference Books:
1. Process Instruments and Control Handbook – by Considine D.M., 4/e, McGraw Hill International, 1993.
2. Instrument Technology, vol. I – by Jones E.B., Butterworths, 1981.

EUREI 504 CONTROL SYSTEMS

Category	L	T	P	Total Hrs	C	S	T	Credits
CE	3	1	--	4	40	60	100	4

UNIT-I

Transfer functions and Mathematical Modeling of linear systems: Block diagram reduction of control systems, signal flow graphs, Introduction to Mathematical modeling of Control system Components-AC Servo Motors, DC Servo Motors, Tachometers and Synchro-Transmitter & Receiver- modeling of electrical networks and Mechanical systems.

UNIT-II

Time domain Analysis of Control Systems: Time response First and Second order systems with standard input signals, steady state error constants, Time Response analysis of P,I,D,PI,PID controllers

UNIT-III

Concepts of stability and necessary conditions for Stability: Routh-Hurwitz criterion, relative stability analysis, the concept and construction of Root loci. Analysis of control systems with Root locus.

UNIT-IV

Frequency Response Analysis: Correlation between time and frequency responses, Polar Plots, Bode Plots, Log Magnitude versus Phase Plots, All pass and Minimum phase systems, Nyquist stability Criterion, and Constant M and N circles.

UNIT-V

State Space Analysis: Introduction, Concept of state, State variables and State Model, state model for linear continuous time systems, solutions of state equations, diagonalization, concept of controllability and observability.

Text Books:
1. Control Systems Engineering, I.J.Nagrath and M.Gopal, Wiley Eastern Ltd.
2. Control Systems , A.NagoorKani, R.B.A Publishers

Reference Books:
1. Modern Control Engineering, Ogata, PHI publication, 4th edition, 2002.
2. Automatic Control Systems, Benjamin C. Kuo, PHI publication, 7th edition, 2002.

B.Tech. (EIE) – V SEMESTER
EUREI 505: PRINCIPLES OF COMMUNICATION ENGINEERING

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Linear Modulation Systems: Modulation, Frequency Translation, Amplitude modulation, AM equation, Modulation index, Spectrum of AM Signal, power relations, AM generation and detection, SSB- generation & detection, VSB.

UNIT-II

Angle Modulation: Angle modulation, FM, FM Equation, modulation index, frequency deviation, NBFM, WBFM, Spectrum of FM, Bandwidth of FM, Carson's rule, Phase modulation, Comparison of FM and PM, Generation of FM, Pre-emphasis and De-emphasis

UNIT-III

Discrete modulation techniques: Sampling, sampling Theorem for low pass and band pass signals, Multiplexing, TDM and FDM systems, PAM, Pulse time modulation - Pulse Width Modulation and Pulse Position Modulation – generation and detection.

UNIT-IV

Digital Modulation Techniques: Pulse Code Modulation, Differential Pulse Code Modulation, Delta Modulation, Adaptive Delta Modulation, Companding, ASK, FSK, PSK and higher order modulation techniques.

UNIT-V

Telemetry and Telecontrol: TRF Receiver, Super Heterodyne Receiver, General Telemetry system, Landline Telemetry system, RF Telemetry, Voltage Telemetry, Current Telemetry, Position Telemetry systems, Landline Telemetry Feedback systems, Radio frequency Telemetry.

Text Books:
1. Electronic Communication Systems G. Kennedy, TMH, 2000.
2. A Course in Electrical and Electronic Measurements, and Instrumentation – A K Sawhney, Dhanpat Rai & Co. 2005

Reference Books:
1. Communication Systems (analog&Digital), Sanjay Sharma, S.K. Kataria & Sons, 2003
2. Principles of Communication Systems, H. Taub and Schilling, TMH, 2000.
3. Modern Digital and analog communications, B.P.Lathi, Oxford Press, 2001.
4. Telemetry principles, D. Patranabis, TMH, 2000

B.Tech. (EIE)V SEMESTER
EUREI 506 DIGITAL SIGNAL PROCESSING

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Characterization of systems in Discrete Time: Impulse response and system function H(z) of digital systems, Frequency response, Stability analysis, Direct form-I, Direct form-II, Cascade and Parallel realization structures of digital filters, finite word length effects, Limit cycle and Dead band effect.

UNIT-II

Discrete Fourier transform (DFT): Discrete-Time Fourier transform, computation of DFT, circular convolution and linear convolution using DFT, overlap-add method, overlap-save method, Fast Fourier Transform (FFT), Radix-2 decimation-in-time and decimation-in -frequency algorithms, Inverse FFT.

UNIT-III

Design of IIR filters: Design of IIR filters from analog filters, Butterworth filters, Chebyshev filters, Comparisons, frequency transformations, design examples, Impulse invariant, bilinear transformation method.

UNIT-IV

Design of FIR filters: Linear phase characteristics, Frequency response of linear phase FIR Filters, Fourier series method, window function technique, Frequency sampling method, Comparison between IIR and FIR filter.

UNIT-V

DSP Architecture: Harvard architecture, pipelining, multiplier, Accumulator, general-purpose digital signal processors, Fixed-point digital processors, floating point digital signal processors. Applications of DSP in spectrum analysis, filtering, Telecommunication and bio-medical.

Text Books:
1. Oppenheim A.V.& Schafer R.W- digital signal processing, PHI.
2. Ifeacher E.C & Jervis B.W, digital signal processing –A practical approach, Second Edition, Pearson Edu.

Reference Books:
1. Sanjit K.Mitra- Digital signal processing- A computer based approach, Third edition TMH.
2. P Ramesh Babu, Digital Signal Processing, Scitech publications.

B.Tech. (EIE) – V SEMESTER
EUREI 511: DIGITAL ICs & LINEAR ICs LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Twelve Experiments should be conducted from the following

1. Minimization and realization of a given function using gates
2. Function generation using decoders and multiplexers
3. Seven-segment display experiments
4. Four bit and eight bit adders and subtractors
5. Experiments on SR latch and Master-Slave JK flip-flops using SSI gates
6. Design and testing of Mod-N synchronous counters
7. Op-Amp Applications.
8. Schmitt Trigger.
9. Active Filters
10. 555 Timer - Monostable .
11. IC Voltage Regulator.
12. D/A Converters.
13. Symmetrical Square wave generator using PSPICE
14. 555 Timer as an Astable Multivibrator using PSPICE

B.Tech. (EIE) – V SEMESTER
EUREI 512: MICROPROCESSORS LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. Arithmetic operations-Addition and subtraction.
2. Multiplication and division.
3. Block manipulation.
4. Largest number in an array, Average of n-numbers.
5. Sorting of numbers.
6. Factorial of a number, Fibonacci series
7. Hexadecimal and decimal counters
8. Interfacing of D/A converter
9. Interfacing of A/D converter
10. Interfacing of DC motor
11. Interfacing of stepper motor
12. Traffic light controller

B.Tech. (EIE) – VI SEMESTER
EUREI 601: INDUSTRIAL ELECTRONICS

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Introduction to Thyristors: Basic structure, operation and static V-I characteristics, Turn-on methods, Switching characteristics, gate characteristics, series and parallel operation of Thyristors. UJT- Basic structure, static emitter characteristics, potential divider equivalent circuit, SCR-Different details. Introduction to SCR , SCR- Basic structure, two transistor model, V-I characteristics, ON and OFF times of Gate, SCR rating, DIAC - Basic structure, V-I characteristics, SCS- Basic structure, two transistor equivalent, Diode transistor equi-valent. TRIAC- Basic structure, V-I characteristics, Positive bias and negative bias operations

UNIT-II

Polyphase Rectifiers: Three-phase half wave delta-wye rectifier with resistive load. Delta to double wye half rectifier with interphase transformer and with resistive load, Three phase delta wye bridge rectifier with restive load, general m- phase rectifier, D.C power outputs, efficiencies, and ripple factors. Transformer utility factor, rectifier performance, Commutation in poly phase rectifiers.

UNIT-III

Controlled Rectifiers: Single phase controlled rectifiers, half wave controlled rectifier with resistance load and RL load, Full wave controlled rectifiers with resistance load and with RL load. Three phase controlled rectifiers; half wave rectifier with resistance load, and with RL load. Six phase half wave controlled rectifiers with resistance load.

UNIT-IV

DC motor speed control: Methods of speed control, single-phase SCR drive,

and three phases SCR drives. Closed loop motor control systems, Half wave feedback circuit for series motor drive. Half controlled SCR Bridge for series motor drive. Inverters and Choppers: Inverter configuration and applications, Chopper configuration and applications.

UNIT-V
AC motor speed control: Methods of speed control, the chopper controlled rotor resistance scheme, speed control by variation of stator voltage using SCRs, closed loop speed control of an induction motor by variation of stator voltage using SCRs. Variable frequency AC motor drive. P.W.M. control scheme, Voltage fed inverter control, Current fed inverter control.

Text Books:

1.   Engineering Electronics, John D. Ryder, TMH.
2.   Industrial Electronics, G.K. Mithal, Khanna Publishers, 2001.
3.   Industrial Electronics, Rasheed

Reference Books:

1.   Power Electronics, P. C. SEN, TMH, 1999.
2.   Thyristors and its Applications, M.Rama Murthy, 1977, East West Publications.

B.Tech. (EIE) – VI SEMESTER
EUREI 602: ANALYTICAL INSTRUMENTATION

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	0	--	3	40	60	100	3

UNIT-I

Classification of analyzers: Classification according to properties, sample-state, signals and methods, Gas analyzers: Thermal conductivity type-, Paramagnetic method-magneto-dynamic, magnetic wind types, Zirconia Oxygen analyzer, electrochemical reaction method, opacity meters-chemiluminescence technique

UNIT-II

Liquid analyzers: Potentiometry, ORP, Redox methods, Dissolved Oxygen cell, pH measurement-construction of reference cell, measuring cell, combined cell, pH measurement circuits, Conductivity-cell and circuits, Turbidity and nephelometer.

UNIT-III

Spectroscopic techniques: The electromagnetic spectrum, classification of spectroscopic techniques. UV- Visible range spectroscopy: sources, detectors, colorimeters, spectrophotometers. Infra-red spectroscopy: Dispersive, non dispersive, single channel and double channel techniques, sources, detectors, FT IR spectrometer.

UNIT-IV

X-ray spectroscopy: Generation and characteristics of X rays, Detectors-ionization chamber, proportional counter, GM counter, scintillation counter; absorption spectroscopy; diffraction spectroscopy , fluorescence spectroscopy; construction of Goniometer and Debye-scherrer camera. Chromatography: Classification, Gas chromatography, schemes, sampling systems, detectors, study and analysis of chromatogram, principles of high pressure Liquid chromatography.

UNIT-V

NMR spectroscopy: Techniques and schemes, sweeping magnetic type and cross-coil types. Sampling techniques: Importance, general components, oil traps, steam injected suction system, sample preparation system in steam analysis, Environmental pollution monitoring instruments: gas pollutants-outline and techniques- carbon monoxide, sulphur dioxide, nitrogen oxides, Hydro carbons, ozone; water pollution parameters and monitoring.

Text Book:

1. Hand book of analytical instruments, RS Khandpur, TMH pub. 2002

Reference Books:

1. Principles of Industrial instrumentation, D. Patranabis, TMH publishing co., 2000
2. Instrumental methods of analysis–HH Willard,LL Merritt,Jr., JA Dean, FA Settle, JR, CBS publications.

Category	L	T	P	Total Hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Measurement of Pressure: Introduction to pressure- Manometers, Bourdon gauges, Diaphragm gauges, Bellows gauges, Bell gauges, Electrical types, Vacuum gauges- McLeod gauge, Knudsen gauge, Thermocouple gauge, Ionization gauge, Differential pressure transmitter – Pneumatic and Electrical types, Calibration of pressure gauges.

UNIT-II

Measurement of temperature: Introduction to temperature- Temperature standards, Bimetallic thermometer, filled-in thermometers, vapour pressure thermometers, Resistance thermometers, 3-lead and 4-lead arrangement, thermistor, thermocouples – types and ranges characteristics, laws of thermocouples, cold-junction compensation, thermo well, installation of thermocouples, Radiation pyrometer single and two colour pyrometers, optical pyrometer

UNIT-III

Measurement of flow: Introduction to flow- Variable head flow meters- orifice plate, venturi tube, Annubar for DP measurement, dall tube, flow nozzle, Variable area flow meters- pitot tube, Rota meter, Mass flow meters, positive displacement meters, turbine flow meter, vertex shedding flowmeter, electromagnetic flow meter, ultrasonic flow meter, laser Doppler flow meter, open channel flow measurements, solid flow measurement , Corollis flow meter , flow meters calibration

UNIT-IV

Measurement of level: Introduction to level- Sight glass, float gauge, displacer, torque tube, bubbler tube, diaphragm box D/P methods, electrical methods – resistance type, capacitance type, ultrasonic level gauging, inductive level gauge, nuclear radiation methods, radar level transmitter, solid level measurement.

UNIT-V

Sophistication in Instrumentation: Nano instrumentation-introduction- nano stylus instruments, optical instruments, scanning electron beam type instrument. Condition monitoring- introduction, vibration monitoring, IR camera, Acoustic emission technique, ultrasonic scanning technique. Environmental pollution monitoring- Introduction, air pollution monitoring, water pollution monitoring. Introduction to online measurements and control.

Text Books:
1. Measurement Systems – Applications and Design – by Doeblin E.O., 4/e, McGraw Hill International, 1990.
2. Principles of Industrial Instrumentation – Patranabis D. TMH. End edition 1997
3. Mechnical Measurements and Instrumentation& Control-by A.K. Sawhney, Puneet Sawhney, Dhanpat rai & Co.
4.Transducers and Instrumentation by -D.V.S Murthy.

Reference Books:
1. Process Instruments and Control Handbook – by Considine D.M., 4/e, McGraw Hill International, 1993.
2. Mechanical and Industrial Measurements – by Jain R.K., Khanna Publishers, 1986.
3. Instrument Technology, vol. I – by Jones E.B., Butterworths, 1981.

EUREI 604: BIO MEDICAL INSTRUMENTATION

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I
Physiological systems and Bio-signals: Physiological systems of the body, Functional structure of the cell, resting and action potentials, functioning of the heart, physiological signal amplifiers.

UNIT-II
Electrodes, Sensors, and Transducers: Transduction – Electrodes for biophysical sensing – types of electrodes: surface, needle, micro – inductive, capacitive and temperature transducers.

UNIT-III
Measurement of Biological, Physiological parameters: Measurement of blood pressure, blood volume, respiration rate, temperature, ECG, EEG, EMG and PCG, Safety measures implemented in Biomedical Instrumentation.

UNIT-IV
Patient Monitoring Systems and ICU assisting devices: Intensive cardiac care units and Central monitoring systems, Patient monitoring through biotelemetry. Pacemakers, Defibrillators, Ventilators and Respirators.

UNIT-V
Medical Imaging Systems: X-ray machines, Principles of computer tomography (CT), CT number scale Scanning Systems, Detector arrays. Principles of Nuclear Magnetic Resonance (NMR) and MR Imaging, T1 and T2 based imaging, Basic MRI system, Introduction to PET (elementary treatment).

Text Books:
1. Biomedical Instrumentation and Measurements, Leslie Cromwell, Fred J Weibell, and Erich   A Pfeiffer, PHI/Pearson Education, 2003.
2. Hand Book of Biomedical Instrumentation, RS Khandpur, TMH, 2003.

Reference Books:
1. Principles of Medical Imaging, K.Kirk Shung, Benjamin Tsui and Michael. B. Smith, Academic Press Inc., New York.
2. Introduction to Biomedical Equipment Technology, Joseph J Carr, John M.Brown, 4th Edition, Pearson Education, Singapore, 2001.

EUREI605/ EUREC605/ EIREC 604:
ENGINEERING ECONOMICS AND MANAGEMENT

Category	L	T	P	Total hrs	C	S	T	Credits	Dept.
HS	3	--	--	3	40	60	100	3	Mech.

UNIT-I

Fundamentals of Economics – Scarcity and Efficiency Market, Command and Mixed Economics. Basic Elements of Supply and Demand – Law of Demand – Elasticity of Demand.

UNIT-II

Business Organizations – Individual Proprietorship – Partnership – The Corporation. Statement of Profit and Loss – The Balance Sheet – Break-Even Analysis – Cost Concepts – Elements of Costs.

UNIT-III

Principles and Functions of Management – Evolution of Management Thought – Decision Making Process. Organization Theory and Process – Leadership – Motivation – Communication – Conflict Management in Organization.

UNIT-IV

Plant Location – Plant Layout – Production Planning and Control – Product Design and Development – Channels of Distribution. Materials Management – Inventory Control.

UNIT-V

Industrial Disputes and their Settlement – Provision of Factories Act and Industrial Disputes Act., Recent Trends in Contemporary Business Environment.

Text Books:
1. Engineering Economics, Vol.1, Tara Chand, Nem Chand & Bros, 13th ed.
2. Industrial Engineering and Management by O.P.Khanna, Khanna publishers Ltd.

Reference Books:
1. Engineering and Managerial Economics by Maheswari, . Sultan chand& Co, 19th ed.
2. A Text book of Economic Theory by Dhingra and Garg, Sultan chand& sons, 2nd ed.
3. Cost accounts by Shukla and Grewal, S.Chand& company, 14th ed.
4. Principles and Practice of Management by L.M.Prasad, Sulltan Chand & Sons

B.Tech. (EIE) – VI SEMESTER
EUREI 606: PROCESS CONTROL

Category	L	T	P	Total hrs	C	S	T	Credits
CE	4	0	--	4	40	60	100	4

UNIT-I

Introduction: History ,Control Objectives, Benefits, Levels of Process Control-Block Diagram of process control – Elements and Process variables-degrees of freedom-Characteristics of liquid system, gas system, thermal system - Mathematical model of liquid process, gas process, flow process, thermal process - Batch process and continuous process.

UNIT-II

Basic control actions: Characteristics of on-off, proportional, single - speed floating Control, integral and derivative modes - composite control modes - PI, PD and PID control modes -Response of controllers for different types of test inputs – Pneumatic and electronic controllers to realize various control actions. Typical control schemes for level, flow, pressure and temperature.

UNIT-III

Actuators and Valves: – Introduction – Pneumatic – Hydraulic – Electric Actuators – I/P– P/I Converters – Basic Control Valves – Control Valve Characteristics – Types of Control Valves -Control Valve Sizing - Control Valve selection - Cavitation and Flashing in Control Valves- Calibration of control valves.

UNIT-IV

Controller tuning – Introduction – Process Reaction Curve Method - Ziegler-Nichols Method – 1/4th Decay Ratio – Damped Oscillation Method – Auto tuning – Statistical Analysis – Piping and Instrumentation Drawing

UNIT-V

Complex Control schemes: – Introduction – Feed Forward Control, Cascade Control – Ratio Control.
Applications of Process Control: Distillation column-Control of overhead and bottom product composite- Control of chemical reactor - control of heat exchangers - steam boiler –combustion control, drum level control.

Text Books:

1. Automatic Process Control, Eckman, D.P. Wiley Eastern Limited, 1985
2. Process Control Instrumentation Technology: Curtis Johnson, PHI, New Delhi, 2011.
3. Principles of Process Control - D Patrnabis, TMH, New Delhi, 1996.
4. Process Control by Peter Harriot ,TMH, New Delhi, 2008.
5. Process Control : Dynamics Concepts and Applications – SK Singh, PHI 2009

Reference Book:

1. Handbook of Process Control: B.G Liptak

B.Tech. (EIE) – VI SEMESTER
EUREI 611: PROCESS CONTROL LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. Study of ON-OFF Controllers
2. Response of P, I, D and P + I + D Controllers for various test inputs using MATLAB
3. I/P converter
4. P/I Converter
5. Control valve characteristics.
6. Temperature Process Control
7. Pressure Process Control
8. Flow Process Control
9. Level Process Control
10. Response of Two-capacity liquid level process using MATLAB
11. Tuning of Controllers using MATLAB

B.Tech. (EIE) – VI SEMESTER
EUREI 612: BMI AND SIGNAL PROCESSING LAB

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Six Experiments from Part- I, Two Experiments from Part-II and Part-III should be conducted

PART-I

1) Study and recording of ECG with Unipolar Limb leads
2) Study and recording of ECG with Bipolar Limb leads
3) Study and recording of EEG and EMG
4) Instrumentation amplifier design for ECG,EEG and EMG
5) Notch filter design for ECG,EEG and EMG
6) Study and recording of Pulse rate and Respiration rate
7) Study and recording of Heart sounds using Phono Cardio Graph
8) PC based data acquisition
9) Study of Biotelemetry system
10) Study and comparison of biomedical signals using ECG,EEG & EMG Simulators

PART-II: MATLAB

1) Representation of Discrete Time sequences and systems.
2) Filter analysis and implementation.
3) FIR and IIR Filters Design.

PART-III: EXPERIMENTS USING TMS3206713
1) Sampling.
2) Sine wave generation.
3) FIR filter Design.
4) IIR filter Design.

EUREI 613: ADVANCED COMMUNICATION SKILLS & ENGLISH LANGUAGE LABORATORY

Category	L	T	P	Total Hrs	C	S	T	Credits	Dept.
HS	3	--	--	3	100	--	100	2	English

UNIT - I
Report writing: Types of reports, Writing technical reports and scientific papers Writing a Statement of Purpose.

UNIT - II
Presentation Skills: Make effective presentations, expressions which can be used in presentations, use of non-verbal communication, coping with stage fright, handling question and answer session, Audio-visual aids, PowerPoint presentations and Seminar Skills.

UNIT - III
Interview Skills: planning and preparing for interviews, facing interviews confidently, use of suitable expressions during interviews.

UNIT - IV
Group Discussion: objectives of a GD; Types of GDs; Initiating, continuing and concluding a GD.

UNIT - V
Debate: difference between debate and group discussion, essentials of a debate, conducting a debate and Telephone Etiquette.

English Language Laboratory

Introduction to Phonetic Transcription: Phonemes: Vowels, Consonants and Diphthongs, Syllabification, Weak and Strong Forms, Word Stress.

Difficulties of Indian Speakers of English: Sound, Stress and Intonation Problems

Use of Dictionary to Develop Pronunciation:

Fluency and Continuous Speech: Problems:
(Fluency Techniques, Pauses, Intonation, Styles of Speech - Formal and Informal)

Text Book:

1. Language Lab Manual, Department of English, GITAM University, 2012.
2. Jayashree Mohanraj et al., Speak Well, Orient Black Swan, 2011.

Reference Books:

1. E. Suresh Kumar et al, A Handbook for English Language Laboratories (With CD), Cambridge University Press India Pvt Ltd. 2009.
2. Edgar Thorpe, Winning at Interviews, Pearson Education, 2006.
3. Hari Mohan Prasad, How to prepare for Group Discussions and Interviews, Tata McGraw Hill, 2006.

B.Tech. (EIE) – VI SEMESTER
EUREI 614: PERSONALITY DEVELOPMENT

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	-	-	-	Non Credit

UNIT-I
HUMAN BEHAVIOUR / PSYCHOLOGY

UNIT-II
MOTIVATION

UNIT-III
TEAM WORK: Inter Personal Skills – Group Activities – Group Discussion

UNIT-IV
CREATIVITY: Lateral Thinking – Brain Storming Etc.

UNIT-V
PRESENTATION SKILLS: Public Speaking, Anchoring- Extempore

UNIT-VI
INTERVIEW SKILLS: Non-Verbal Communication – Listening And Answering Skills

UNIT-VII
ETHICS AT WORK PLACE

B.Tech. (EIE) – VII SEMESTER
EUREI 701: DIGITAL SYSTEM DESIGN USING VERILOG

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Introduction to Verilog: Verilog as VHDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Functional Verification, System Tasks, Programming Language Interface (PLI), Module, Simulation and Synthesis Tools, Test Benches. Language Constructs and Conventions

UNIT-II

Gate Level & Behavioral Modeling: Introduction, AND Gate Primitive, Other Gate Primitives, Illustrative Examples, Tri-State Gates, Array of Instances of Primitives, Design of Flip-flops with Gate Primitives, Delays, Strengths and Contention Resolution, Net Types, Design of Basic Circuits, Exercises. Behavioral Modeling: Introduction, Operations and Assignments, Functional Bifurcation, Initial Construct, Always Construct, Examples, Assignments with Delays, Wait construct, Multiple Always Blocks, Designs at Behavioral Level, Blocking and Non blocking Assignments, case, if, assign, repeat, for-loop, disable , while, forever, constructs. Parallel blocks, force-release construct, Event.

UNIT-III

Data Flow Level & Switch Level Modeling: Introduction, Continuous Assignment Structures, Delays and Continuous Assignments, Assignment to Vectors, Operators. Switch Level Modeling - Introduction, Basic Transistor Switches, CMOS Switch, Bi-directional Gates, Time Delays with Switch Primitives, Instantiations with Strengths and Delays, Strength Contention with Trireg Nets, Exercises.

UNIT-IV

Digital Design with State Machine Charts: State Machine Charts, Derivation of SM Charts, Realization of SM Charts, Implementation of the Dice Game, Alternative realizations for SM Charts using Microprogramming

UNIT-V

Designing with FPGAs and CPLDs: Xilinx 3000 Series FPGAs, Designing with FPGAs, Using a One-Hot State Assignment, Altera Complex Programmable Logic Devices (CPLDs), Altera FLEX 10K Series CPLDs, Verilog Models: Static RAM Memory, A simplified 486 Bus Model, Interfacing Memory to a Microprocessor Bus, UART Design.

Text Books:

1. Design through Verilog HDL – T.R. Padmanabhan and B. Bala Tripura Sundari, WSE, 2004 IEEE Press.
2. Fundamentals of Logic Design with Verilog – Stephen. Brown and Zvonko Vranesic, TMH, 2005.
3. Digital Systems Design using VHDL – Charles H Roth, Jr. Thomson Publications, 2004.

Reference Books:

1. Advanced Digital Design with Verilog HDL – Michael D. Ciletti, PHI, 2005
2. A Verilog Primer – J. Bhaskar, BSP, 2003.

B.Tech. (EIE) – VII SEMESTER
EUREI 702 MICROCONTROLLERS AND APPLICATIONS

Category	L	T	P	Total Hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I
Introduction to concept of microcontroller, comparison of microprocessor and microcontroller, intel 8051 microcontroller architecture, pin diagram, special function registers, external memory interface with 8051, operation of I/O ports.

UNIT-II
Counters and timers in 8051, timer modes, Serial data input, output , serial data modes, interrupts, timer flag interrupt, serial port interrupt, external interrupts, software generated interrupt control, Addressing modes, external data moves, code memory, read only data moves. Push and Pop.

UNIT-III
Instruction set of 8051. Data exchange, byte level logical operations, bit level logical operations, rotate and swap operations, instruction affecting flags, incrementing, decrementing, arithmetic operations, jump and recall instruction, assembly language programming of 8051 Calls and subroutines, interrupts and returns. Member of MCS-51 family with special reference to 89C51 IC.

UNIT-IV
Applications: stepper motor control, speed/position control of ac/dc motors, control of physical parameters like temp, pressure, flow, level and humidity.

UNIT-V
Introduction m 16 bit microcontroller, Intel MCS-96 family, architecture, special interference to member with on chip EPROM, ADC, PWM etc.

Text Books:
1. The 8051 Microcontroller and Embedded Systems – Mazidi and Mazidi, PHI, 2000.
2. The 8051 Microcontroller architecture, programming and applications, Kenneth J.Ayala Penram International Pub, 2nd edition 1996

Reference Books:
1. Microcontrollers (Theory & Applications) – A.V. Deshmuk, WTMH, 2005.
2. Design with PIC Microcontrollers – John B. Peatman, Pearson Education, 2005.

Category	L	T	P	Total hrs	C	S	T	Credits
CE	3	--	--	3	40	60	100	3

UNIT-I

Basics of Computer Aided Process Control: Introduction-role of computers in process control-elements of computer aided process control system-Classification –computer aided process control architecture. Direct Digital Control (DDC): Introduction-DDC Structure-DDC Software position algorithm and velocity algorithm. Microcomputer based DDC structure.

UNIT-II

Programmable logic controllers: introduction- evaluation of PLC-PLC architecture-basic structure- Program Scan, PLC programming-ladder diagram-PLC communications-PLC selection-PLC installation.

UNIT-III

Distributed Digital Control Systems (DCS) : Introduction, Architecture, subsystems, Local field station, Presentation and monitoring device, Communication options in DCS-Configuration. Display systems-Display parameters-Display in process control environment.

UNIT – IV

Industrial Communication and Field buses: Introduction-smart sensors-smart differential pressure transmitter-smart temperature transmitter-smart positioner for control valves-advantages of smart sensors-field bus systems- Field bus structure -HART protocol-device description language (DDL) - Industrial field buses- -Factory Instrumentation Protocol(FIP)- PROFIBUS-foundation field bus-controller and I/O interfaces-OLE for process control (OPC).

UNIT-V

Advanced strategies for Computer Process Control: Introduction-predictive control -Adaptive control-inferential control -Statistical process control Algorithms for processes with dead time-optimal control.

Text Books:
1. Computer-based Industrial Control, Krishna Kant, PHI Publishers, 2003.
2. Computer Aided Process Control, S.K.Singh, PHI, 2005.
3. Computer control of Processes, M Chidambaram, Narosa publishers.

EUREI 721: OPTIMAL CONTROL

Category: Dept Elective I.   Credits: 3   Hours: 3 per week

UNIT-I
Introduction:Statement of optimal control problem – Problem formulation and forms of optimal control – Selection of performance measures- Necessary conditions for optimal control – Pontryagin's minimum principle – State inequality constraints – Minimum time problem.

UNIT-II
Numerical Techniques for Optimal Control: Numerical solution of 2-point boundary value problem by steepest descent and Fletcher Powell method solution of Ricatti equation by negative exponential and interactive methods.

UNIT-III
LQ Control Problems and Dynamic Programming : Linear optimal regulator problem – Matrix Riccatti equation and solution method – Choice of weighting matrices – Steady state properties of optimal regulator – Linear tracking problem – LQG problem – Computational procedure for solving optimal control problems – Characteristics of dynamic programming solution – Dynamic programming application to discrete and continuous systems – Hamilton Jacobi Bellman equation.

UNIT-IV
Filtering and Estimation: Filtering – Linear system and estimation – System noise smoothing and prediction – Gauss Markov discrete time model –
Estimation criteria – Minimum variance estimation – Least square estimation – Recursive estimation.

UNIT-V
Kalman Filter and Properties: Filter problem and properties – Linear estimator property of Kalman Filter – Time invariance and asymptotic stability of filters – Time filtered estimates and signal to noise ratio improvement – Extended Kalman filter – Case study: Boiler optimization and control.

Text Books:
1. Krik D.E., 'Optimal Control Theory – An introduction', Prentice hall, N.J., 1970
2. Sage, A.P., 'Optimum System Control', Prentice Hall N.H., 1968.
Reference Books:
1. Anderson, BD.O. and Moore J.B., 'Optimal Filtering', Prentice hall Inc., N.J., 1979.
2. S.M. Bozic, "Digital and Kalman Filtering", Edward Arnould, London, 1979.
3. Astrom,K.J.,Introduction to Stochastic Control Theory, Academic Press, N.Y., 1970.

B.Tech. (EIE) – VII SEMESTER
EUREI 722:   ROBOTICS AND AUTOMATION

Category: Dept Elective I.　　　　Credits: 3　　　Hours: 3 per week

UNIT-I
Introduction: Historical robots, robots in science fiction, future trends of robots, Definitions of robots, present application status. Robot End-Effectors : Classification of End-Effectors, Drive Systems for Grippers, Mechanical Grippers, Magnetic Grippers, Vacuum Grippers, Adhesive Grippers, Hooks, Scoops and other miscellaneous devices, Active and Passive Grippers.

UNIT-II
Robot Drives, Actuators and Control : Functions of Drive Systems, General Types of control, Pump Classification, I, introduction to Pneumatic Systems, Electrical Drives, DC Motors & Transfer Functions, Stepper Motor, Drive Mechanisms.

UNIT-III
Robot Kinematics: Forward and Reverse Kinematics of 3 degrees of Freedom Robot Arm, Forward and Reverse kinematics of a 4 degree of freedom arm manipulator in 3-D, Homogeneous Transformations, Kinematics Equations using Homogenous Transformation.

UNIT-IV
Robot Sensors: Need for Sensors, Types of Sensors, Robot Vision Systems, Robot Tactile Systems, Robot Proximity Sensors. Robot Speech and Hearing: Speech Synthesis, Noise Command Systems, Speech Recognition Systems.

UNIT-V
Robot Intelligence & Programming the Robots: AI and Robotics, Expert Systems, Interpreting Sensory Inputs, Intelligent Tutoring Systems. Robot Languages, Robot Operating System, Robot Application Programming, Teaching Robots. Robot Applications: Capabilities of Robots, Materials Handling, Machine, Loading and Unloading, Machining and Fettling, Robot Assembly, Welding, Future Applications.

Text books:
1. Robotics Technology and Flexible Automation, Satya Ranjan, TMH, New Delhi, 2001.
2. Robotics:Introduction,　　Programming　　and　　Projects,　　Maxwell Macmillan.International   Edition, James L.Fuller, 2000.

B.Tech. (EIE) – VII SEMESTER
EUREI 723: DATA COMMUNICATION & NETWORKS

Category: Dept Elective I   Credits: 3   Hours: 3 per week

UNIT-I
Introduction to data communications, data communication networking computer communication architecture, the OSI reference model data link controls: line configurations. Flow control, error control, and data link control protocols. Multiplexing: FDM, synchronous TDM, statistical TDM.

UNIT-II
Switching Networks: Circuit switching,Single mode networks, Digital Switching concepts, Digital private branch exchange, control signaling packet switching principles, virtual circuits and data grams, routing, traffic control, x.25 packet switching.

UNIT-III
Local, Metropolitan Area Networks: LAN/WAN/MAN technology, Bus/Tree and star topologies using metallic media optical fiber bus, the ring topology, medium access control protocols, MAC performance, LAN/WAN/MAN standards, IEE 802.2, 802.4 IEEE 802.5, IEEE 802.6

UNIT-IV
Protocols and Architecture: Transport services, protocol mechanism, network services, the TCP/IP pro-tocol suite, TCP, UDP and TP4, a comparison of OSI, TCP/IP and SNA architectures. Internetworking: Principle of internetworking, the bridge, routing with bridges, connection less and connection oriented internetworking. Session layer services, presentation layer facilities, presentation concepts.

UNIT-V
ISDN and ATM Networks: ISDN concept – Transmission structures, user access, ISDN protocols, Broadband ISDN, broadband ISDN architecture. Introduction to ATM-concept of ATM-ATM pro-tocol reference model- ATM network reference model-ATM layers-ATM adaption layers- Applications.

Text books:
1. Data and Computer communications, William Stallings, PHI, 6/e.
2. Computer Networks, A. Tanenbaum, PHI/Pearson Education Asia.
Reference book:
1. Data communications and Networks, Behrouz. A.Fourouzan, PHI.

EUREI 731 : VIRTUAL INSTRUMENTATION

Category: Dept Elective II.   Credits: 3   Hours: 3 per week

UNIT-I

Introduction: Virtual Instrumentation – Definition, flexibility – Block diagram and Archi-tecture of Virtual Instruments – Virtual Instruments versus Traditional Instruments Data flow techniques-graphical programming in dataflow– Review of Popular softwares in virtual Instrumentation.

UNIT-II

VI Programming Techniques: VI- sub VI- Loops-structures-charts- arrays-clusters –graphs- for-mula node-math script- local and global variable- strings-file I/O-execution control- Instrument drivers.

UNIT-III

Data Acquisition in VI: Introduction to data acquisition-signal conditioning-classes of signal conditioning-field wiring and signal measurement-ground loops-A/D, D/A converters, plug-in DAQ boards- Analog input/output cards - Digital Input/Output cards-counter and timer I/o boards-Isolation-techniques-Opt isolation -Data acquisition modules with serial communication.

UNIT-IV

Communication networked modules: Introduction to PC Buses – Local bus: ISA – PCI – RS232 – RS422 – RS485 – Interface Bus – USB, PCMCIA, VXI, SCXI, PXI. Instrumentation buses: Modbus – GPIB - Networked bus – ISO/OSI Reference model, Ethernet, and VISA

UNIT-V

Real time control and Applications: Design of ON/OFF controller- PID controller -electronic prototyping and testing with ELVIS- real-time data acquisition-transducer analysis-signal processing with DSP module-real-time embedded control with CRIO.

Text books :
1. LabVIEW based advanced Instrumentation System, PSumathi, Springer science Elsievier 2007.
2. Practical Data Acquisition for Instrumentation and Control Systems, John Park and Steve Mackay, Elsevier Publications.

Reference Books:
1.Labview Graphical programming, Gary Jhonson, Mc Graw Hill, Newyork, 1997.
2.Labview for everyone, Lisa K.Wells and Jeffrey Travis, Prentice Hall, NewJersey, 1997.

B.Tech. (EIE) – VII SEMESTER
EUREI 732: NEURAL NETWORKS AND FUZZY LOGIC

Category: Dept Elective II.   Credits: 3   Hours: 3 per week

UNIT-I
Fundamentals of artificial Neural Networks: Biological neurons and their artificial models, Neural processing, learning and Adaptation. Hebbian, perceptron, delta, widrow – hoff, correlation, winner – take –all, outstar learning rules.

UNIT-II
Single Layer Perceptions: Multi player Feed forward Networks – Error back propagation training algorithm, problems with back propagation, Boltzmann training, Cauchy training, Combined back propagation/Cauchy training,

UNIT-III
Hopfield networks: Recurrent and Bi-directional Associative Memories, Counter Propagation Network, Artificial Resonance Theory (ART).

UNIT-IV
Applications of Neural networks: Handwritten digit and character recognition, Traveling salesman problem, Neuro controller – inverted pendulum controller, cerebellar model articulation controller, Robot kinematics, Expert systems for Medical Diagnosis.

UNIT-V
Introduction to fuzzy set theory: Classical set Vs fuzzy set, properties of fuzzy sets, operations on fuzzy sets – union, intersection, complement, T-norm and co T-norm. Fuzzy relations: Operations on fuzzy relations, cylindrical extensions Inference rules, compositional rule of inference.

Text books:
1. Introduction to Artificial Neural System, S.M.Zurada, Jaico Publishing House,1992.
2. Neural Computing–Theory and Practice, Philip D.Wesserman, Van Nostrand Rein hold, New York 1989.
3. Fuzzy sets, Uncertainty, and Information, G.J.Klir, T.A.Folger, Prentice Hall of India, New Delhi, 1988.

References:
1. Neural Networks and Fuzzy Systems, Bart Kosko, Prentice Hall, NJ, 1992.
2. An Introduction to Fuzzy Control, D.Driankov, H.Hellen Doorn, M.Reinfrank, Narosa Publishing House, New Delhi, 1993.

B.Tech. (EIE) – VII SEMESTER
EUREI733 DIGITAL IMAGE PROCESSING

Category: Dept. Elective II.   Credits: 3   Hours: 3 per week

UNIT-I

Fundamentals of Image Processing: Image Acquisition, Image Model, Sampling, Quantization, Rela-tionship between pixels,   distance measures, connectivity, Image Geometry, Photographic film.   Histo-gram: Definition, decision of contrast basing on histogram, operations basing on histograms like image stretching, image sliding, Image classification. Definition and Algorithm of Histogram equalization.

UNIT-II

Image Transforms 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform

UNIT-III

Image Enhancement: (by SPATIAL Domain Methods) Arithmetic and logical operations, point operations, Smoothing filters-Mean, Median, Mode filters. Edge enhancement filters – Directorial filters, Sobel, Laplacian, Robert, KIRSCH Homogeneity & DIFF Filters, Prewitt filter, Contrast Based edge enhancement techniques. Low Pass filters, High Pass filters, sharpening filters. Color image processing, Color fundamentals, color models. Image Enhancement: (By FREQUENCY Domain Methods) Design of Low pass, High pass, EDGE Enhancement, smoothening filters in Frequency Domain. Butter worth filter, Homomorphic filters in Frequency Domain, Advantages of filters in frequency domain, comparative study of filters in frequency domain and spatial domain.

UNIT-IV

Image Compression: Definition, A brief discussion on – Run length encoding, contour coding,   Huffman code, compression due to change in domain, compression due to quantization Com-pression at the time of image transmission.   Brief discussion on:- Image Compression standards.

UNIT-V

Image Segmentation Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation. Image Restoration: Degradation model, Algebraic approach to restoration, Inverse filtering, Least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

Text Books:

1.   Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson Ed., 2nd Education, 2002.
2.   Fundamentals of Digital Image processing – A.K.Jain, Prentice Hall of India.

Reference Books:

1.   Digital Image processing using MAT LAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
2.   Digital Image Processing – William K. Pratt, John Wiley, 3rd Edition, 2004.

EUREI 711: VIRTUAL INSTRUMENTATION LAB

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. Loops and Structures
2. Arrays and Clusters.
3. Sub VI
4. File I/O
5. Lab VIEW signal Express
6. Time response analysis of a model
7. Frequency response analysis of a model
8. Study of PID Controller
9. FFT and digital filtering using SPEEDY-33.
10. Analysis of circuits using NIELVIS.
11. Creating data logger using M-Series-DAQ Board
12. Design and Testing of various circuits for control and Instrumentation.

B.Tech. (EIE) – VII SEMESTER
EUREI 712: MICROCONTROLLERS LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

* Minimum Ten Experiments should be conducted from the following

1. Study and use of 8051 Microcontroller trainer kit.
2. Assembly Language Program for addition of 8 bit numbers stored in array.
3. Assembly Language Program for Multiplication by successive addition of two 8bit numbers.
4. Assembly Language Program for finding largest no. from a given array of 8bit numbers
5. Assembly Language program to arrange 8 bit numbers stored in array in ascending order.
6. Stepper motor control by 8051 Microcontroller.
7. Interfacing of 8 bit ADC 0809 with 8051 Microcontroller.
8. Interfacing of 8 bit DAC 0800 with 8051 Microcontroller.
9. DC motor control by 8051 Microcontroller.
10. Implementation of Serial Communication by using 8051 serial ports.
11. Assembly Language Program for use of Timer/Counter for various applications.

B.Tech. (EIE) – VII SEMESTER
EUREI 713: PROJECT – I

Category	L	T	P	Total hrs	C	S	T	Credits
PW	--	--	6	6	100	--	100	3

- A summary of the progress of the work carried out is to be submitted at the end of VII Semester.
- The progress of the work is to be assessed at the end of the VII semester.

B.Tech. (EIE) – VII SEMESTER
EUREI 714: INDUSTRIAL TRAINING

Category	L	T	P	Total hrs	C	S	T	Credits
IT	--	--	--	--	100	-	100	2

- The student will undergo training in any one of the approved list of industries by the Head of the Dept.
- The duration of the training should be 4 to 6 weeks during summer vacation between 3rd & final years of study.
- The student will submit a detailed report along with the certificate from the industry where they have undergone training to the Department for assessment within a month of return from the training.
- The student will have to give a seminar on the training programme during the VII semester.

B.Tech (EIE) – VIII SEMESTER
EUREI 801: EMBEDDED SYSTEMS

Code	L	T	P	Total Hrs	C	S	T	Credits	Dept.
EUREI 801	3	--	--	3	40	60	100	3	EIE

UNIT-I
INTRODUCTION TO EMBEDDED SYSTEMS: Definition and Classification, Overview of Processors and hardware units in an embedded system, Software embedded into the system, Exemplary Embedded Systems, Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits

UNIT II
DEVICES AND BUSES FOR DEVICES NETWORK: I/O Devices , Device I/O Types and Examples ,Synchronous and Asynchronous Communi-cations from Serial Devices ,Examples of Internal Serial-Communication Devices , UART and HDLC , Parallel Port Devices , Sophisticated interfacing features in Devices/Ports, Timer and Counting Devices , '12C', 'USB', 'CAN' and advanced I/O Serial high speed buses, ISA, PCI, PCI-X, cPCI and advanced buses.

UNIT III
PROGRAMMING IN C: Introduction to C - Data types – Structures – Functions – Arrays – Pointers – strings - Hello world program - Super Loop architecture - delay function - Controlling the port pins - Reading switches - Basic techniques for reading and writing the port pins – Dealing with switch bounce - Adding structure to your code.

UNIT IV
EMBEDDED C: Selection of processors - programming language - operating system - Object-oriented programming with C - The Project Header (MAIN.H) – The Port Header (PORT.H) Meeting real-time constraints - Creating 'hardware delays' using Timer - need for 'timeout' mechanisms - Creating loop timeouts - Testing loop timeouts – Creating hardware timeout - Testing a hardware timeout.

UNIT V
REAL TIME OPERATING SYSTEMS: Definitions of process, tasks and threads, Clear cut distinction between functions ,ISRs and tasks by their charac-teristics, Operating System Services- Goals, Structures, Kernel, Process Manage-

ment, Memory Management – Device Management – File System Organisation and Implemen-tation – I/O Subsystems – Interrupt Routines Hand-ling in RTOS

REAL TIME OPERATING SYSTEMS : RTOS Task scheduling models - Handling of task schedu-ling and latency and deadlines as performance metrics – Scheduling algorithms: Co-operative Round Robin Scheduling,Cyclic Scheduling with Time Slicing (Rate Monotonics Co-operative Scheduling) ,Preemptive Scheduling

INTER PROCESS COMMUNICATION AND SYNCHRONISATION , Shared data problem, Use of Semaphore(s), Prio-rity Inversion Problem and Deadlock Situations, Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key, Message Queues, Mailboxes, Pipes–Virtual (Logical) Sockets, Remote Procedure Calls (RPCs).

Text books:
1. Michael J. Pont, "Embedded C" Addison Wesley, Pearson Education Limited 2002.
2. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003.

Reference Books:
1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes.
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian   Reprint 2000.
3. Wayne Wolf, Computers as Components; Principles of Embedded Computing System Design – Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001.
4. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware /Software Introduction, John Wiley, 2002.

EUREI 841: FIBRE OPTICS AND LASER INSTRUMENTATION

Category: Dept Elective III.   Credits: 3   Hours: 3 per week

UNIT-I

Optical Fibres and Their Properties:
Principles of light propagation through a fiber - Different types of fibers and their properties - Transmission characteristics of optical fiber- Absorption losses -Scattering losses -Dispersion - Optical fiber measurement.

UNIT-II

Optical Sources and Detectors: Introduction to Optical sources LED-structures, Types, characteristics, Applications, LD, PIN structures, Types, characteristics, Applications, APD - Optical detectors, Wavelength Division Multiplexing.

UNIT-III

Industrial Application of Optical fibres: Fiber optic sensors- Fiber optic instrumentation system-Different types of modulators –Detectors-Application in instrumentation- Inter-ferometer method of measurement of length-Moiré fringes-Measurement of pressure, Tempe-rature, current, Voltage, liquid level and strain–Fiber optic gyroscope–polarization-Maintaining fibers.

UNIT-IV

Laser Fundamentals: Fundamental characteristics of laser-Three level and four level lasers-Properties of lasers-Laser modes-Resonator configuration-Q-switching and mode locking-Cavity dumping-Types of laser-Gas laser, solid laser, liquid laser, semi conductor laser.

UNIT-V

Industrial Application of Laser: Laser for measurement of distance, length, velocity, accele-ration, current, voltage, and atmospheric effect-Material processing-Laser heating, welding, melting and trimming materials, removal and vaporization. Holography- Basic principle, methods-Holographic interferometer and applications –Holography for non destructive testing-Holographic

components-Medical application of lasers-laser and tissue interaction.

Text books:
1. Optical Fibre Communications, Gerd Keiser, McGraw-Hill, International Edition,2000.
2. Introduction to lasers and their applications, D.C.O'shea, Russel Callen, Mc Millan,1977.
3. Industrial lasers and their applications, John and Harry, McGraw Hill, 1974.
4. Optical communications, John senior, PHI

References:

1. Industrial applications of lasers, John F Ready, Academic press, 1978.
2. Laser applications, Monte Ross, McGraw Hill, 1968.
3. Optical electronics foundation book, Ghatak A.K. and Thiagarajan K, TMH, New Delhi, 1991.
4. Fibre Optic Communications, John Palais, Pearson Education

B.Tech. (EIE) – VIII SEMESTER
EUREI 842: INSTRUMENTATION FOR PETROCHEMICAL INDUSTRY

Category: Dept Elective III.   Credits: 3   Hours: 3 per week

UNIT-I

Petroleum Processing: Petroleum exploration – Recovery techniques – Oil - Gas separation – Processing wet gases -refining of crude oil.

UNIT-II

Unit Operations in Petroleum Industry: Thermal cracking – Catalytic cracking – Catalytic reforming – Chemical oxidation – Chemical reduction – Precipitation – Polymerization – Alkylation – Isomerization – Production of ethylene, Acetylene and Propylene from petroleum

UNIT-III

Chemical from Petroleum Products: Chemical from petroleum – Methane derivatives – Acetylene derivatives – Ethylene derivatives – Propylene derivatives – Other products

UNIT-IV

Measurement in Petrochemical Industry: Parameter to be measured in refinery and petrochemical industry – Selection and maintenance of measuring instruments – Intrinsic safety of instruments

UNIT-V

Control Loops in Petrochemical Industry: Process control in refinery and petrochemical industry – Control of distillation column control of catalytic crackers and pyrolysis Unit – Automatic control of polyethylene production – Control on vinyl chloride and PVC production.

Text book:

1. Process Control Structures and applications, Balchan .J.G. and Mumme K.I., Van Nostrand Reinhold Company, New York, 1988.

Reference Books:
1. Chemical from petroleum, Waddams A.L, Butter and Janner Ltd., 1968
2. Chemical Process Industries, Austin G.T. Shreeves, McGraw-Hill International student edition, Singapore, 1985.
3. Instrumentation in process Industries, Liptak B.G. Chilton book Company, 1994.
4. Process measurement and analysis, Liptak B.G., Third edition, Chilton book Company,1996.

EUREI 843: DIGITAL CONTROL SYSTEMS

Category: Dept Elective III.   Credits: 3   Hours: 3 per week

UNIT-I

Introduction to Discrete time systems, analogous with continuous-time systems, mathematical models for LTI discrete-time systems, convolution representation and difference equations in advanced and delayed form, Z-transformation of difference equations, analysis of first, second, and higher order systems, stability of discrete-time systems, the Jury's criterion.

UNIT-II

State space modeling of discrete-time dynamical systems, canonical forms, solution to state space equations, properties of the state transition matrix, analysis of discrete-time state equation.

UNIT-III

Equilibrium points and stability definitions, direct method of Lyapunov, definitions of controllability and observability, equivalent controllability/observability conditions. Design of state feedback and output feedback control, Design of observers.

UNIT-IV

Numerical Computations, digital simulation of state-space models, QR decomposition, singular value decomposition, digital control using digital signal processors.

UNIT-V

Introduction to Optimal Control, statement of the optimal control problem, dynamic programming general introduction to the principle of optimality, application to DTS, discrete-time linear quadratic problem, Riccati equation and its solution, optimal state feedback solution.

Text books:

1. Discrete-time Control system, Ogata K., second edition, Prentice Hall Inc., New Jersey, 1992.

2. Digital Control Systems, Kuo B.C, Second edition, Saunders College Publishing, Japan, 1992.

Reference Books:

1. Digital Control System Analysis and Design, Phillips C.L. and Nagle H.T, Third edition, Prentice-Hall, New Jersy, 1995.
2. Computer Controlled Systems Theory and Design, Astrom K,J and Wittenmark, second edition, Prentice Hall, New Delhi, 1990.
3. Digital Control and State Variable Methods, Gopal M., Tata McGraw Hill, New Delhi, 1997.

B.Tech. (EIE) – VIII SEMESTER
EUREI 851 – 8516: INTER DEPARTMENTAL ELECTIVE-I

Category: Inter-Departmental Elective   Credits: 4   Hours: 4 per week

Department: Other Departments (One of the following)

Course Code	Name of the Course
EUREI 851	Remote Sensing& GIS
EUREI 852	Data Base Management Systems
EUREI 853	Software Engineering
EUREI 854	Systems Modeling and Simulation
EUREI 855	Software Project Management
EUREI 856	Artificial Intelligence
EUREI 859	Power Electronics
EUREI 8510	Project Planning and Management
EUREI 8512	Introduction to Micro Mechanical Systems(MEMS)
EUREI 8513	Entrepreneurship
EUREI 8514	Public Administration
EUREI 8516	Equipment for construction Industry

B.Tech. (EIE)VIII SEMESTER
EUREI861– 8619: INTER DEPARTMENTAL ELECTIVE-II

Category: Inter-Departmental Elective   Credits: 4   Hours: 4 per week

Department: Other Department (One of the following)

Course Code	Name of the Course
EUREI 861	Environmental Impact Assessment
EUREI 862	Operating Systems
EUREI 863	Web Technologies
EUREI 865	Computer Aided Design
EUREI 867	Mechatronics
EUREI 868	Education Research & Methodologies
EUREI 869	Professional Ethics
EUREI 8611	Thermodynamics
EUREI 8614	Very Large Scale Integrated System Design (VLSI)
EUREI 8615	Fundamentals of Civil Engineering
EUREI 8616	Engineering Materials
EUREI 8617	Computer Networks
EUREI 8619	Managerial & Engineering Economics

B.Tech. (EIE) – VIII SEMESTER
EUREI 811: INDUSTRIAL INSTRUMENTATION LABORATORY

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	3	3	100	--	100	2

     * Minimum Ten Experiments should be conducted from the following
1. Temperature Measurement with Three-wire RTD using Lab VIEW.
2. Implementation of Strain Gauge using Lab VIEW.
3. Temperature Measurement with thermocouple using Lab VIEW.
4. LVDT characteristics using Lab VIEW
5. Flow measurement using Lab VIEW.
6. Traffic light controller using PLC.
7. Stepper Motor Controller using PLC.
8. Pressure process control using PLC.
9. Level measurement and control using PLC
10. Implementation of Pressure process using SCADA.
11. Calibration of Pressure Gauge.
12. Calibration of Temperature Sensor.

B.Tech. (EIE) – VIII SEMESTER
EUREI 812: PROJECT II

Category	L	T	P	Total hrs	C	S	T	Credits
CE	--	--	9	9	100	--	100	5

B.Tech. (EIE) – VIII SEMESTER
EUREI 813: COMPREHENSIVE VIVA

Category: CE   Credits: 2   Department: EIE

Through five periodic Viva-voce exams for 20 marks each, conducted by a panel of examiners. The course content for Viva exams shall be announced at the beginning of the Semester.

B.Tech. (EIE) – VIII SEMESTER
EUREI 851 – ELECTIVE-I: REMOTE SENSING & GIS

UNIT-I:

Fundamentals of Remote Sensing:

Introduction, Electromagnetic radiation, Electromagnetic Spectrum, Energy interactions with Earth's surface materials and Atmosphere, Sensors and Platforms, False Colour Composite (FCC) image, Image interpretation techniques, Satellite remote sensing – Indian context.

UNIT-II:

Fundamentals of GIS:

Introduction, Elements of GIS, Vectorization, Rasterization, Geo-referencing, Map Projections, Digitization Process, Data Base handling, Types of data structures, overlay analysis, surface terrain models – Digital elevation model (DEM), Triangulated irregular network (TIN), and Slope models.

UNIT-III:

RS & GIS Techniques for Natural resources Management:

Landuse/land cover classification systems, Forest cover, agriculture and wasteland management. Water resources management.

UNIT-IV:

RS & GIS Techniques for Infrastructure Planning and Management:

Urban utilities, cadastral mapping and transport network. GPS Navigation system for various applications.

UNIT-V:

RS & GIS Techniques for Natural Disasters Management:

Earthquakes, Landslides, cyclones and Floods – Hazard Zonation, Risk assessment, Relief and Rehabilitation measures.

Text Books:

1. P.K. GUHA, Remote Sensing for the Beginner, EWP Ltd.
2. M.ANJIREDDY, Text Book of Remote Sensing and Geographical Information Systems, BSP Publishers.
3. Lillesand, T.M. and Kiefer, Remote Sensing and Image Interpretation, R.W. John Wiley & Sons Publishers.

B.Tech. (EIE) – VIII SEMESTER
EUREI 852: ELECTIVE-I: DATA BASE MANAGEMENT SYSTEMS

Prerequisite: File processing

UNIT I:

Introduction to DBMS – Overview, File system vs DBMS, Advantages of DBMS, Storage data, queries, Transaction Management, DBMS Structure

UNIT II:

E-R model Entities, Attributes and Entity sets, Relation ship and Relation ship sets, Features of ER model, Conceptual database design with ER model.

UNIT III:

Relational model – integrity constraints over relations and enforcement, Querying relation data, Logical database design, views, destroying/altering tables and views.Relational algebra and calculus

UNIT IV:

SQL – Basic SQL, Query, union, interest, except, Nested Queries, Aggregated Operation, Null values, Embedded SQL, cursors, ODBC and JDBC, Triggers and Active database, designing active databases

UNIT V:

Transaction management, concurrency control & crash recovery – Transaction concept, transactions and schedules, concurrent execution of transactions, lock – based concurrency control, crash recovery.
Case Study: Oracle0i (SQL, PL/SQL & Triggers)

Text Book:

1. Database Management Systems – Raghu Ramakrishnan and Johannes Gehrke McGraw-Hill
2. Data System Concepts – H.F.Korth and A.Silberschatz McGraw-Hill

Reference Book:

1. Fundamentals of Database System – R.El. Masri and S.B.Navathe

B. Tech. (EIE) –   VIII SEMESTER
EUREI 853: ELECTIVE-I: SOFTWARE ENGINEERING

UNIT I:

Introduction - Software problem – Software Engineering Problem – Software Engineering Approach

UNIT II:

Software Process – Software Process – Characteristics of Software Process – Software Development Process – Project management process – Software Configuration Management Process – Process Management Process.

UNIT III:

Software Requirements Analysis & specification – Software Requirements – Problem Analysis – Requirements Specifications – Validation – Metrics.

UNIT IV

Planning a Software Project – Cost Estimation – Project Scheduling – Staffing & personnel Planning – Software Configuration Management plans – Quality Assurance Plans

UNIT V:

Function Oriented Design – Design Principles – Module Level Concepts – Design Notation and Specifications – Structured Design Methodologies – Verification – Metrics
Testing – Testing Fundamentals – Functional Testing – Structural Testing – Testing Procedure

Text Book:

1. An Integrated Approach to Software Engineering by Pankaj Jalot – Narosa Publishers

Reference Book:

1. Software Engineering a practitioner's approach by Pressman

B. Tech. (EIE) –   VIII SEMESTER
EUREI 854: ELECTIVE-I: SYSTEMS MODELING & SIMULATION

UNIT-I

System Models:Concept of a system, System Environment, Stochastic activities, continuous and Discrete Systems, System Modeling, Physical and Mathematical Models for Systems, Static and Dynamic Categorization of these physical and mathematical Models. Principles used in modeling.

System Simulation: Monte–Carlo Method: Comparison of Simulation and analytical methods, Experimental nature, Types of Simulation, Numerical Computation Technique for continuous model and for Discrete model, Distributed Lag Models, Cobweb Models.

UNIT-II

Continuous System Simulation: Differential Equations, Analog Computers, Analog Models, hybrid Computers, digital – Analog Simulations, Continuous System Simulation Languages (CSSLS), CSMP – III, Hybrid Simulation, Feedback Systems, Simulation of an, Interactive Systems, Real-Time Simulation.

System Dynamics: Exponential Growth Models, Exponential Decay Models, Logistic Curves, Generalization of Growth Models, Simple System Dynamics Diagrams, Multi-segment Models, Representation of Time Delays, WORLD Models.

UNIT-III

Probability Concepts In Simulation: Stochastic Variables, Discrete Probability functions, Continuous Probability functions, Measures of Probability functions, Numerical Evaluation of Continuous Probability functions, continuous Uniformly Distributed Random Numbers, A Uniform Random Number Generator, Generating Discrete Distributions.

Arrival Patterns And Service Times: Poisson's Arrival patterns, Exponential Distribution, Erlang Distribution, Hyper-Exponential Distribution, Normal Distribution, Queuing Disciplines, Mathematical Solutions of Queuing Problems.

UNIT-IV

Introduction To Gpss: GPSS Programs, General Description Action Times, Succession of Events, Choice of Paths, Simulation of a manufacturing Shop, Conditional Transfers, Control Statements, Functions, Simulation of a Super Market, Transfer modes, GPSS Model of a Simple Telephone system.

UNIT-V

Random Access Systems:

Aloha, Slotted Aloha, Carrier Sense Multiple Access, Delay Calculations in CSMA/CD, Performance comparisons, Reservation Techniques.

Routing And Flow Allocation: Routing Model, Shortest Path Algorithms, Capacity Constrains, Flow control and Routing, Routing in Practice.

Text Books:

1. System Simulation by GEOFFREY GORDON, PHI, Second Edition.
2. Modeling and Analysis of computer Communications Networks. Networks Jeremiah F. Hayes, Khanna Publications.

Reference Book :

1. Geoffrey Gordon

EUREI 855: ELECTIVE-I: SOFTWARE PROJECT MANAGEMENT

UNIT I:

Conventional Software Management, Evaluation of Software Economics.

UNIT II:

Improving Software Economics.

UNIT III:

The old way and the new, Life-Cycle Phases.

UNIT IV:

Artifacts of the Process, Model-Based Software Architectures Workflows of the Process, Checkpoints of the Process, Iterative Process Planning.

UNIT V:

Project Organisations and Responsibilities, Process Automation.Project Control and Process Instrumentation, Tailoring the process.

Text Book:

1. Software Project Management, A real world guide to success by Joel Henry.
2. Software Project Management by Royce.
3. Software Proejct Management in practice by Pankaj Jalote
4. Quality Software Project Management by Futrell

EUREI 856: ELECTIVE-I: ARTIFICIAL INTELLIGENCE

UNIT I:

Introduction to Artificial Intelligence, Artifical Intelligence Problems, Artificial Intelligence Techniques, problems, problem space and search-defining the problem as a state space search, Production System, Problem Characteristics. Heuristic Search Technologies Generate & Test Hill Climbing, Best First search, Problem reduction, Constraint satisfaction, Means Endo Analysis

UNIT II:

Knowledge Representation Knowledge using predicate logic representing simple facts in logic, representing instance and is relationship, computable functions and predicates resolution.

UNIT III:

Representing Knowledge Using Rules: Procedural Vs Declarative knowledge, Logic programming, Forward Vs backward Reasoning, Matching, Control Knowledge.

UNIT IV:

Symbolic Reasoning under uncertainty – Introduction to Non-monotonic Reasoning, logics for Non-monotonic Reasoning, Implementation: depth first search – Dependency – Directed Backtracking. Justification – based truth maintenance, logic based truth maintenance systems Statistical Reasoning –

UNIT V:

Probability and bayes theorem, Certainity factors and rule – base systems beyesian networks, dempst6er – Shaffer theory.

UNIT-V

Wek & Strong Slot and Filler Structures Sematic nets, Frames, Conceptual dependencies, Scripts

Text Books:

1. Artificial Intelligence – Rich E & Knight K TMH 1991

Reference Books:

1. Artificial Intelligence structures and strategies complex problem solving – George F-Lugar Pearson Education.

EUREI 859: ELECTIVE-I: POWER ELECTRONICS

UNIT-I

Power Semiconductor Switches: Power diodes, Power transistors – Thyristor family – SCR – Triac – GTO –Power MOSFET – IGBT – two transistor model – Gate characteristics – static and dynamic characteristics – Turn – ON – Turn – OFF methods – Series and Parallel operation of Thyristors – Gate triggering circuits – UJT as an SCT trigger – Thyristor ratings. Protection circuits.

UNIT-II

Phase Controlled Rectifiers: Single phase and three phase – half wave – full wave – and Bridge controlled rectifiers – Daul converters – effect of load and source inductances – Natural commutation.

UNIT-III

Choppers: Principle of operation, step up choppers – step down choppers – various types of choppers – Morgan – Jones – Oscillation chopper – commutation circuits.

UNIT-IV

Inverters: Claassificatin – series and parallel inverters – single phase and three phase inverters McMurny – McMurray Bedford inverter – Voltage control – Harmonic reduction – current source invertes.

UNIT-V

AC to AC Converters: Principle of operation of CYclo-converter – single phase to single phase Cyclo-converter – Cyclo-converter circuits – three phase output. Single phase and three phase voltage controllers using Thyristor and Traic – AC choppers.

Text Books:
   1. Power Electronics, M.Rashid. PHI
   2. Power Electronics, P.S. Bimbra, Khanna Publishers
   3. Power Electronics, Singh M.D. and Khanchandani. TMH

Reference Books:
   1. An introduction to Thyristors and their applications, M.Rama Murthy, East-West Press
   2. Power Electronics, R.Ramshaw.
   3. Thyristorised Power Controllers, Dubey., Wiley Eastern Ltd.

B. Tech. (EIE) – VIII SEMESTER
EUREI 8510: ELECTIVE-I: PROJECT PLANNING AND MANAGEMENT

UNIT–I

Project Management Systems, Organization, Scope of construction management, Significance, concept of scientific management, qualities of manager, organization – authority policy, recruitment process and training.

UNIT- II

CPM and PERT: Introduction of Pert and CPM, Planning scheduling and controlling, Bar charts, Pert and CPM networks.

UNIT–III

Estimation, Resource Analysis, Justification and Evaluation – Introduction – Costing Proposals – Budgets – Resource analysis – Pricing Projects – Project Risk analysis – Cash Flow Consideration – Strategic Investment Decisions.

UNIT–IV

The role of Management and Leadership in Project environment – Individual Skills and Attitudes – Individual Motivation – Structural implications for Project managers – Cultural Implications – Management Style – Development of Management Thinking.

UNIT–V

Project Review – Project Completion & Handover – Long term Project audit and review – Continuous improvement – Bench Marking of Performance and Process – The role of Project Leader in the World Class Projects.

Text Book:
1. Harvey Maylor, Mac Millan India Ltd., Delhi

Reference Book:
1. Punmia: Laxmi Publications

EUREI 8512: ELECTIVE-I: INTRODUCTION TO MICRO ELECTRO MECHANICAL SYSTEMS(MEMS)

UNIT I

1. Introduction: History of MEMS, Overview of MEMS Processes, Properties of Silicon, A Sample MEMS Process. Definitions and Terminology, A sample Process, Lithography and Etching. (3 hrs.)

2. Micromachining: Subtractive Processes (Wet and Dry etching), Additive Processes (Evaporation, Sputtering, Epitaxial growth). (4 hrs)

3. Fundamental Devices and Processes: Basic mechanics and electrostatics for MEMS, parallel plate actuators, pull-in point, comb drives. Electrostatic actuators; MEMS foundries, Cronos MUMPs (multi user MEMS process). (5 hrs)

UNIT II

1. MUMPs (Multi User MEMS Process): JDS Uniphase MUMPs processing sequence and design rules. Design rules; applications; micro hinges and deployment actuators. 5 Hrs.

2. CMOS MEMS: CMOS foundry processes, integrated IC/MEMS, MEMS postprocessing, applications. (4 Hrs)

UNIT III

1. Thermal Transducers: bimorphs, "heatuators", cilia arrays. (3 hrs.)

2. MicroOptoElectroMechanical Systems (MOEMS): Micro Scanners, Digital Mirror Display, Retinal Scanning Display. Grating light valve, coroner cube retroreflector, optical switches, other micro-optical devices (5 hrs)

iezoresistivity; Scanning Probe Microscopy: scanning tunneling microscope (STM), atomic force microscope (AFM)(3 Hrs)

UNIT IV

1. Wireless MEMS: mechanical and electrical resonators, Q-factor, switches, filters (3 hrs)

2. Power for MEMS: thin film batteries, micro fuel cells, energy fields, MEMS Packaging and Assembly: microassembly: serial and parallel, deterministic and stochastic; microgrippers: HexSil process; packaging techniques (4 hrs)

UNIT V

1. The future of MEMS: Biomems – neural implants, gene chips, diagnostic chips; MEMS in space; mechanical computers; invisible and ubiquitous computing (3 hrs)

Text Books:

1. Fundamentals of Microfabrication: The Science of Miniaturization, Second Edition ISBN: 0849308267, CRC Press, 1997 by Marc J Madou
2. MEMS a Practical Guide of Design, Analysis, and Applications Korvink, Jan, Paul, Oliver 2006.
3. Mechanics of Microelectromechanical Systems Lobontiu, Nicolae, Garcia, Ephrahim 2004.
4. MEMS & Microsystems TMGH 2002 by Tai-ran Hsu
5. Microsensors, MEMS & Smart Devices John Wiley 2002 by JW Gardner & VK Varadan

B. Tech. (EIE) – VIII SEMESTER
EUREI 8513: ELECTIVE-I: ENTREPRENEURSHIP

UNIT I

Introduction:

Meaning, importance, benefits of Entrepreneurship-characterizes, factors of Entrepreneurship-Barriers of Entrepreneurship-Difference between Entrepreneurship and management-Evolution of the concept of entrepreneur-Difference between entrepreneur and entrepreneur. Motivational aspects of entrepreneur (McClelland theory)

UNIT II

Project Identification And Selection:

Meaning, classification of projects-Factors involved in project identification. Selection-significance contents, formulation of a project report – specimen of a project report-planning commission's guidelines for formulating a project-Basics of capital budgeting-Pay back period. Net present value.Internal Rate of Return.

UNIT III

Sources Of Finance:

Cost of capital-importance of a capital-Basic concepts, rational assumptions-cost of debt, reference, equity capital-source of finance-internal, external sources-institutional finance to entrepreneurs and institutional support to entrepreneurs.

UNIT IV

Project Appraisal:

Concept project appraisal-Methods of project appraisal, Economic analysis, Financial analysis, Market analysis Technical feasibility and Managerial competence (assessment of working and fixed capital Govt. Policies, qualitative methods of market analysis, Life cycle segmentation).

UNIT V

Ownership Structures & Evaluation Of Edps:

Ownership structures-sole trader, partnership (Partnership deed) types of partnership-Joint stock companies-Difference between private and a public company – Advantage and disadvantages of the ownership structures – Distinction between MDP and EDP – Training methods and Role playing (Games).

Text Books:
1. Harold Koontz & Heinz Weihrich. Essentials of Management, McGraw Hill International.
2. Hirich R.D. & Peters Irwin M.P., Enterpreneurship, Mc Graw Hill
3. Rao T.V. & Deshpande M.V., Prayag Metha, Nadakarni M.S. Developing Entrepreneurship, Hand Book. Learning Systems.
4. Donald Kurado & Hodgelts R.M., Entrepreneurship A Contemporary Appraoch. The Dryden Press.
5. Dr Patel V.G. Seven Business Crisis, Tata McGraw Hill
6. Timmons J.N. New Venture Creation – Entrepreneurship for 21ST century, Mc Graw Hill International.

References:
1. Patel J.B .Nold S.S. A Manual on Business Opportunity Identification, Selections, EDH.
2. Rao C.R. Finance for Small Scale Industries.
3. Pandey M.W. Compier Guide to Successful Entrepreneurship. Vikas Publishing

B. Tech. (EIE) –   VIII SEMESTER
EUREI 8514: ELECTIVE-I: PUBLIC ADMINISTRATION

Definition, nature and scope of public administration; the chief executive; leadership qualities of administrator, principles of organization; organization of Ministries of Home and Finance; personnel administration – bureaucracy; recruitment, promotion, conduct and discipline, employer – employe relations; administration at work-planning, policy formulation, decision making supervision, coordinator, integrity in administration; public corporations in India; financial administration in India; local administration in India.

B. Tech. (EIE) –   VIII SEMESTER
EUREI 8516: ELECTIVE-I: EQUIPMENT FOR CONSTRUCTION INDUSTRY

UNIT I

Earth Work – Introduction, use of available equipment, suitability of job conducting, Excavation equipments, loading and lifting, transporting equipments, compacting equipments.

UNIT II

Foundation – Introduction, blasting, Drilling, Piling, Anchoring, Drainage.

UNIT III

Concreting – Introduction, Concrete mixtures, types, Concrete batching plants, vibrators, lifts, pumps, slip from shuttering, steel fabrication, cutting, bending, cranes, reinforcement fabrication.

UNIT IV

Miscellaneous – Road Pavers, sand blasting, grouting, compressors, gate valves – control equipment for out let – and spillways, types of control gates.

Reference Books:

1. Construction equipment and its planning and applications – Varma Mahesh, Metrop Politin books, New Delhi.
2. Construction planning ewuipment and methods – Peurifiry R L, Led better WB, Mc Graw – Hill books. Co.
3. Hydro power statins, Varshney RS, New Chand & Bros, Roorkee.

B. Tech. (EIE) – VIII SEMESTER
EUREI 861: ELECTIVE-II: ENVIRONMENTAL IMPACT ASSESSMENT

UNIT I:

Introduction to EIA. Definition of E IA and EIS.C.E.guidelines in USA, preparation of EIS, Elements of EIA.

UNIT II:

Agency Activities, Environmental setting. Environmental attributes, air, water, soil, ecology, noise Socio-Economic aspects, Culture and human aspects (Human settlements – rehabilitations)

UNIT III:

Environmental impacts, Identification measurement, Aggregation, Secondary and Cumulative Impacts. Criteria for selection of methodology, impact assessment methodologies, procedure for reviewing environment impact statement.

UNIT IV:

Case studies, Economic impact analysis energy production impact analysis, cost benefit analysis, Environmental impact mitigation and control measures.

Reference Books:
1. Environmental Impact Analysis – Urban & Jain.
2. Environmental Impact Analysis – Canter, Mc Graw Hill publishers.

B. Tech. (EIE) – VIII SEMESTER
EUREI 862: ELECTIVE-II: OPERATING SYSTEMS

UNIT I

Introduction: Operating systems: Fundamentals Definition, Types of O.S, Batch Processing Systems, multiprogramming catch systems, time sharing systems, distributed systems, real time systems, services, system calls, system programs.

UNIT II

Operating system: Process management , Process concept, Process scheduling, operations on processes, cooperating processes, threads, inter-process communications. CPU Scheduling - Scheduling algorithms, multiple processor and real time scheduling. Process synchronization – Critical lsection problems, semaphores.

UNIT III

Leadlocks: Characterization, handling, Prevention, Avoidance, Detection & Recovery.

UNIT IV

Storage management: Memory management – swapping, paging, segmentation, segmentation & paging. Virtual memory – What is virtual memory? Demand Paging, Page Relacement, frames, thrashing demand segmentation.

UNIT V

Case study: **UNIX:** Fundamental Concepts in UNIX, MS-DOS: Fundamental Concepts in MS- DOS

Text Book:

1. Applied Operating Systems Concepts – Avil Silberschatz &j Peter Galvin, Grey Gagne.

Reference Book:

1. Modern Operating Systems – Andrew S. Tanenbaum, PHI.

B. Tech. (EIE) – VIII SEMESTER
EUREI 863: ELECTIVE-II: WEB TECHNOLOGY

UNIT I

Introduction to Web Technology: Internet, WWW, Web Browsers, Web Servers, URL.

UNIT II

Introduction to HTML & DHTML: Syntax, Forms, Cascade Style Sheets.

UNIT III

The Basic of java Script, Perl, Primitives, Operator and Expression. Dynamic Document with Java Script.

UNIT IV

Introduction to Java Servelets Programming., Introduction to Applet Programming.

UNIT V

Structure of Web Application, Deploying Web Application.

Text Books:
1. Programming the World Wide Web by Robert W Sebesta
2. Professional Java Servelets 2.3 by John Bell Wrox Publical
3. Beginners PHP, Apache, MY Sql, Web Development, by Michael Glass Wrox.

UNIT-I

Fundamentals of CAD – Introduction – The design process- Application of computers for design – Operating systems – Hardware in CAD: The design work station – I/O Devices – CAD system configuration – Creating database for manufacturing – benefits of CAD.

UNIT II

Interactive Computer Graphics – Graphic display devices – Graphics system – Graphics standards – Graphical user interface – Transformation systems – windowing – clipping – 2D and 3D transformations – Linear transformation – Display files for 3D data – Geometric Modeling – Modeling Techniques – Wire frame Modeling – Surface Modeling – 3D Solid Modeling.

UNIT III

Introduction to finite element Analysis – CAD techniques to finite element data preparation – Automatic mesh generation – presentation of results – 3-dimensional shape description and mesh generation – CAD applications of FEM.

UNIT IV

CAD applications and Exposure to CAD packages: Simple examples of computer aided drafting, design and analysis – introduction to simple machine elements – Analysis of cross sectional area, centroid & moment of inertia-Kinematics of crank-slider mechanism and other simple design applications. Introduction to CAD packages like ANSYS, NASTRON, NISA – II.

UNIT V

Introduction to Artificial Intelligence Introduction to Artificial Intelligence – Applications of AIin design and CAD.

Text Books:
1. CAD/CAM- Computer Aided Design & Manufacturing, by M.D. Groover & E.Q.Zimmer, Pearson.
2. Computer Aided Design and Manufacturing by Dr. Sadhu Singh, Khanna Publishers.

Reference Books:
1. Computer Aided Design in Mechanical Engineering, by V. Rama Murthy.
2. Elements of Computer Aided Design 7 manufacturing, by Y.C. Rao,
3. Computer Aided Kinetics for Machine Design, by D.L.Ryan.
4. computer Aided Design and Manufacturing, by C.B. Besant & C.W.K. Lui.
5. computer Aided Analysis & Design by S. Ghosal, Prentice Hall of India.
6. CAD/CAM/CIM by Radhakrishna, New age international.

EUREI 867: ELECTIVE-II: MECHATRONICS

UNIT I
Introduction: Multi disciplinary Scenaries, Origins, Evolution of Mehatronics. An overview of electronics, Introduction to Manufacturing Design.

UNIT II
Sensors and Transducesrs: Intreduction and background, difference between transducer and sensor tranducers types, transduction principle, photoelectric transducers, thermistors, thermo devices, thermo couple, inductive transducers capacitive transducers, pyroelectric transducers, piezoelectric transducers. Half effect transducers, Fibre optic transducers.

UNIT III
Actuatory: Introduction, types and application areas electromechanical actuators. DC motors AC Motor.

UNIT IV
System modeling: Introduction, system making mechanical system, electrical system, fluid system, thermal systems, translational mechanical system with sprin lamper and mass. Modeling electric motor, modeling phenumatic actuator.

UNIT V
Digital logic: Digital logic nuer system

EUREI 868: ELECTIVE-II: EDUCATION RESEARCH & METHODOLOGIES

Research methodology: An Introduction – meaning of research – objectives of research – motivation in research – types of research – research approaches – significance of research – research methods versus methodology – research and scientific method – importance of knowing how research is done – research process criteria of good research – Defining the research problem – selecting the problem – necessity of the defining problem – technique involved in defining a problem – an illustration – Research design:- meaning of research design – need for research design – features of a good design-important concept relating to research design – different research designs – basic principles of experimental designs.

Interpretation and report writing: Meaning of interpretation – why Interpretation? – technique of interpretation – precaution in interpretation – significance of report writing – different steps in writing report – layout of the research report – types of reports – oral presentation – mechanics of writing a research report – precautions for writing research reports.

Text Books:
1. C.R.Kothari, research methodology –Methods and techniques, Second edition, Wishwa Prak.
2. Research in Education, Best Pearson.

B. Tech. (EIE) – VIII SEMESTER
EUREI 869: ELECTIVE-II: PROFESSIONAL ETHICS

Ethics, nature and purpose; ethical theories; ethics in business and management, ethics in engineering, global ethical issues, Professional Ethics concerns one's conduct of behavior and practice when carrying out professional work. Such work may include consulting, researching teaching and writing, codes of Ethics are concerned with a range of issues, including:

1. Academic Honesty
2. Adherence to confidentiality Agreements.
3. Data Privacy
4. Handling of Human subjects
5. Impartiality in data analysis and professional consulting
6. Professional accountability

Reference:
http://www/is.cityu.edu.hk/research/resources/isworld/ethics/

EUREI 8611: ELECTIVE-II: THERMODYNAMICS

UNIT I

Introduction – Basic concepts – Thermodynamic systems, Micro & Macro systems – Homogeneous and heterogeneous systems – Concept of continuum – Pure substance – Thermodynamic equilibrium, State Property, Path, Process – Reversible and irreversible cycles – Energy as a property of the systems – energy in state and transition, work Heat, Point function, Path function – Heat transfer. Zeroth Law of thermodynamics – Concept of equality of temperatures – Joule's experiments –

UNIT II

First law of thermodynamics – Corollaries – Isolated systems and steady flow systems – Specific heats at constant volume and pressure – First law applied to flow systems – systems undergoing a cycle and change of state – First law applied to steady flow processes – Limitations of first law of thermodynamics.

UNIT III

Perfect gas laws – Equation of state – Universal gas constant various non-flow processes – Properties of end states – Heat transfer and work transfer – change in internal energy – throttling and free expansion. Second law of thermodynamics – Kelvin Plank statement and Clausius statement and their equivalence, Perpetual motion machines of first kind and second kind – Carnot Cycle – Heat engines and heat pumps – Carnot efficiency – Clausius theorem – Clausius inequality – Concept of entropy – Principles of increase of entropy Entropy and disorder.

UNIT IV

I.C. engines: Classification, comparison of two stroke and four stroke engines, comparison of SIand CI engines. Air cycles – Otto, Diesel, Dual, Stirling, Ericcson and Atkinson cycles and their analysis. Valve timing and port timing diagrams – Efficiencies – air standard efficiency, indicated thermal efficiency, brake thermal efficiency, mechanical efficiency, volumetric efficiency and relative efficiency. Testing and performances of I.C. engines. Basic principles of carburetion and fuel injection.

UNIT V

Refrigeration & Air Conditioning: Bell-Coleman cycle, Vapor compression cycle-effect of suction and condensing temperature of cycle performance.

Properties of common refrigerants, Vapor absorption system, Electrolux refrigerator.

Reference Books:
1. Engineering Thermodynamics, by P.K.Nag, Tata McGraw Hill Publications company.

Reference Books:
1. Thermal Engineering, by M.L.Mathur and F.S.Mehta, Jain Brothers.
2. Applied Thermodynamics-IIby R. Yadav
3. I.C. Engines, by Mathur and Mehta
4. I.C. Engines by VGanesan.
5. Thermal Engineering by P.L.Ballaney Khanna Publishers

EUREI 8614: ELECTIVE-II: VERY LARGE SCALE INTEGRATED SYSTEM DESIGN (VLSI)

UNIT I

Review of microelectronics and introduction to MOS technology: Introduction MOS and related VLSItechnology, NMOS, CMOS, BICMOS, GaAs Technologies, Thermal aspects of processing, production of E beam masks.

UNIT II

MOS and BICMOS circuit design process: MOS layers, stick diagrams, design rules and layout, 2i.meter, 1.2i. meter CMOS rules. Layout diagrams, Symbolic diagrams.

UNIT III

Basic circuit concepts: Sheet resistance, Area capacitance of layers, delay unit, wiring capacitances, choice of layers.Scaling of MOS circuits: Scaling models, Scaling function for device parameters, Limitation of Scalling.

UNIT IV

Sub system design   process: Architectural issues, switch logic,   examples of structural design(Combinational logic), design of ALU sub system, commonly used storage elements, aspects of design rules.

UNIT V

Test and Testability: Design for testability built in self test (BIST), testing sequential logic, practical design for test guide lines, scan design techniques, etc,

Text Book:

1. Basic VLSIdesign bby Douglas A, Pucknell, Kamran Eshraghian, Prantice-Hall, 1996 3rd edition.

Reference Book:

1. Mead, C A and Conway, L.A, Introduction to VLSIsystems, Wesley-Wesley

EUREI 8615: ELECTIVE-II: FUNDAMENTALS OF CIVIL ENGINEERING

UNIT I
Surveying – classification, general principles of surveying, Basic terms and delimitations in chain, campus, leveling surveying and use of surveying.

UNIT II
Buildings Planning and Drawing: Buildings, definitions of orientation, plan, section, Elevation and site plan, classification according to NBC, Plinth area, Floor area, carpet area, Floor space index, Floor area ratio, Selection of site for residential buildings, Building regulations and Bye laws.

UNIT III
Building materials and Instillations: Construction materials – stone, brick, cement, cement mortar, concrete, steel, their properties – uses, Instillations – water supply – types of pipes, pipe appurtenances, Type of pumps, sanitation services, Lifts, Air conditions, Electrical instillations.

UNIT IV
Units of measurement of different items of works in residential buildings.

Reference Books:

1. Surveying by B.C.Punnia
2. Planning and Designing by Gurucharan Singh
3. Estimation, Costing, Specifications and Valuation in Civil Engineering by M.Chakravarthi.

B. Tech. (EIE) – VIII SEMESTER
EUREI 8616: ELECTIVE-II: ENGINEERING MATERIALS

UNIT I

Metallic Materials: Ferrous Materials: Iron Materials, Carbon Materials, Phase Distribution. Heat Treatment of steel. Wrought iron. Properties and Classification of Plain Carbon & alloy steels like Marogim Steel, Hard Field Steel. Stainless Steel. Tool Steel. Cast ron and its applications.

UNIT II

Composite Materials: Science: Polymer matrix Composites Cement Matrix Composites, Carbon Matrix Composites, Metal matrix Composites. Ceramic matrix Composites. Applications: Structural applications, Electronic application. Thermal applications. Electro chemical applications. Environmental applications. Biomedical applications.

UNIT III

Polymeric Materials: Types of polymerization, properties of Macro Molecules, Fabrication of Plastics, preparation of epoxy reins and polycarbonates. Carbon fibre reinforced Plastics. Molecular Computers, Rubbers and Elastomers.

UNIT IV

Ceramic & Refractory Materials: Ceramics: Classification of white wears. Manufacturing of white wears. Earthen wear Stine wear. Engineering applications of refractory materials.

UNIT V

Electronic Materials: Introduction: Metallic glasses – surface ecostic view materials – Biometallic ceramics – Cermets – Electrets – Nano Phase Materials. Intermeterial Compounds. SMART Materials, Conducting Polymers, Electronic detectors and Emitters. Logic Structure Materialization Technology.

Text Books:

1. Composite materials Science & Applications. D.L. Chung, Deborah, Springer Publication.
2. Introduction to Physical materials S.H.Aveneer. Tata Mac Grawhill
3. Text Book of Engineering Chemistry, Sashi Chawla, Dhopatrai & Sons
4. Engineering Chemistry, S.S.Dhara

EUREI 8617: ELECTIVE-II: COMPUTER NETWORKS

UNIT I

Introduction – Uses of Computer Networks – Network Hardware – Network Software – Reference Book Models – Example Networks

UNIT II

The Physical Layer – The Theoretical basis for Data Communication – Guided Transmission Media The Public switched Telephone Network – Community Antenna Television – The local loop:Modems, ADSL and Wireless – Cable Modems

UNIT III

Data link layer – Data link layer design issues – Services provided to the Network Layer – Framing Error Control – Flow Control – Error detection and correction – Error correction codes – Error – detection codes – Elementary Data link protocols – An unrestricted simplex protocol – A simplex stop and wait protocol – Sliding window protocols – A one-bit sliding window protocol – A protocol using Go Back N – A protocol using selective repeat – Example Data link protocols – HDCL – High level Data Link Control.

UNIT IV

The medium Access Control Sub-layer – The Channel Allocation Problem – Static Channel Allocation in LAN's and MAN's – Dynamic Channel allocation in LANs and MANs – Multiple Access Protocols – ALOHA – Carrier serve Multiple Access Protocol – Collion Free Protocols – Wireless LAN Protocols – Ethernet – Ethernet Cabling – Manchester Encoding – The Ethernet MAC Sub-layer Protocol – IEEE 802.2: Logical Line Control.

UNIT V

Network Layer – Store and forward Palket switching – Store and forward Palket switching – service provided to the Transport by   -   Implementation   of connectionless service – Implementation of connection oriented service – Comparison of virtual circuit and datagram subnets – Routing Algorithms – Optimality principle – Shorter Path routing – Flooding – Link State Routing – Hierarchical routing – Congestion Control Algorithms – General Principles of Congestion Control – Congestion Prevention Policies – Congestion control in virtual – Circuit subnets – Congestion control in datagram subnets – Loan shedding – Internet Working – How networks differ? How networks can be connected?

EUREI 8619: ELECTIVE-II: MANAGERIAL & ENGINEERING ECONOMICS

UNIT I

Fundamentals of Economics- Scarcity and Efficiency Market, Command and Mixed Economics, Basic Elements of Supply and Demand – Law of Demand – Elasticity of Demand.

UNIT II

Business Organizations – Individual Proprietorship – Partnership – The Corporation. Statement of Profit and Loss – The Balance Sheet – Break – Even Analysis – Cost Concepts – Elements of Costs.

UNIT III

Principles and Functions of Management – Evolution of Management Thought – Decision Making Process. Organization Theory and Process – Leadership – Motivation – Communication – Conflict Management in Organization.

UNIT IV

Plant Location – Plant Layout – Production Planning and Control – Product Design and Development – channel of Distribution. Materials Management – Inventory Control.

UNIT V

Industrial Disputes and their settlement – Provision of Factories Act and Industrial Disputes Act – Recent Trends in Contemporary Business Environment.

Reference Books:
1. Economics – Paul A.Samuelson and William D.Nordhaus.
2. Engineering Economics – Vol.1- Tara Chand
3. Financial Management – S.N.Maheswari
4. Essentials of Management – Koontz and O' Donnel
5. Production and Operation management – B.S.Goel
6. Modern Production / Operation management – Elwood S.Buffa, Rakesh K.Sarin
7. Industrial Law – S.P.Jain
8. Industrial Law – R.P.Maheswari and S.N.Maheswari
9. Labour and Industrial Laws – Singh, Agarwal and Goel