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

B. Tech. (Electronics & Communication Engineering)

Program Code: EUREC 200702

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

Vide Ref. No.:GU/DoAA/10th AC/2013/8-2/UG

Website: www.gitam.edu

B.Tech. (ECE) – Scheme of Instruction
Program code EUREC 200701
I SEMESTER

Sl. No.	Course Code	Name of the Course	Category	Credits	Scheme of Instruction		Total	Scheme of Examination		
					Hours per week			Duration in Hrs.	Maximum Marks	
					L/T	D/P			Sem. End Exam	Con. Eval
1	EUREG 101	Engg. English – I	HS	3	3	---	3	3	60	40
2	EURMT102	Engg. Mathematics	MT	4	4	---	4	3	60	40
3	EURPH 103	Engg. Physics - I	BS	4	4	---	4	3	60	40
4	EURCH104	Engg. Chemistry – I	BS	4	4	---	4	3	60	40
5	EURCS 105	Programming with C	BE	3	3	---	3	3	60	40
DRAWING / PRACTICALS :										
	EURPH 112	Engg. Physics Lab	BS	2	---	3	3	4	--	100
	EURCS 113	Programming with C Lab	BE	2	---	3	3	3	---	100
	EURIE 115	Engineering Graphics Practice	BE	2		4	4	3	60	40
		Total:		**24**	**18**	**10**	**28**	---	**360**	**440**

B.Tech. (ECE) – II SEMESTER

Sl. No.	Course Code	Name of the Course	Category	Credits	Scheme of Instruction		Total	Scheme of Examination		
					Hours per week			Duration in Hrs.	Maximum Marks	
					L/T	D/P			Sem. End Exam	Con Eval
1	EUREG 201	Engg. English – II	HS	3	3	---	3	3	60	40
2	EURMT 202 /EIRMT 202	Higher Engineering Mathematics – I	MT	3	3	---	3	3	60	40
3	EURMT 203 /EIRMT 203	Higher Engineering Mathematics – II	MT	3	3	---	3	3	60	40
4	EURPH 204	Engg. Physics - II	BS	3	3	---	3	3	60	40
5	EURCH 205	Engg. Chemistry – II	BS	3	3	---	3	3	60	40
6	EURCS 206	Object Oriented programming with C+ +	BE	3	3	---	3	3	60	40
DRAWING / PRACTICALS :										
	EURCH 214	Engg. Chemistry Lab	BS	2	---	4	4	4	--	100
	EUREE 217	Electrical & Electronics Workshop Lab	BE	2	---	3	3	3	--	100
	EURCS 213	Object oriented programming with C++ Lab	BE	2	---	3	3	3	--	100
		Total:		**24**	**18**	**10**	**28**	---	**360**	**540**

B.Tech. (ECE) – III SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval	Total	L	T	P	Total
EUREC301/ EIREC301 / EUREI301/ EUREE301	Advanced Engineering Mathematics	MT	3	60	40	100	3	1	-	4
EUREC302 EIREC302	Signals & Systems	CE	3	60	40	100	3	1	-	4
EUREC303	Basic Circuit theory	BE	3	60	40	100	3	1	-	4
EUREC304	Electronic Devices & Circuits	BE	3	60	40	100	3	1	-	4
EUREC305/ EIREC305	Electrical Machines	BE	3	60	40	100	3	1	-	4
EUREC306/ EIREC306	Electromagnetic Waves & Transmission Lines	CE	3	60	40	100	3	1	-	4
EUREC311	Networks & Electrical Machines Lab	BE	2	-	100	100	-	-	3	3
EUREC312	Electronic Devices & Circuits lab	BE	2	-	100	100	-	-	3	3
Total			**22**	**360**	**440**	**800**	**18**	**6**	**6**	**30**

B.Tech. (ECE) – IV SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREC401/ EIREC401	Digital Logic Design	CE	3	60	40	100	3	1	-	4
EUREC402	Analog Electronic Circuits	CE	3	60	40	100	3	1	-	4
EUREC403/ EIREC403	Analog Communications	CE	3	60	40	100	3	1	-	4
EUREC404/ EIREC404	Probability theory and Random Processes	CE	3	60	40	100	3	1	-	4
EUREC405	Filters and Wave Shaping Circuits	CE	3	60	40	100	3	1	-	4
EUREC406/ EIREC406	Control Systems	CE	3	60	40	100	3	1	-	4
EUREC411	Digital Logic Design Lab	CE	2	-	100	100	-	-	3	3
EUREC412	Analog Electronics & Pulse Circuits lab	CE	2	-	100	100	-	-	3	3
EUREC413	Advanced Communication Skills & English Language Lab	HS	2	-	100	100	-	-	3	3
EUREC414	Industrial Tour	IT	Non Credit Audit Courses							
Total			**24**	**360**	**540**	**900**	**18**	**6**	**9**	**33**

B.Tech. (ECE) – V SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREC501 EIREC501	Microprocessors & Interfacing	CE	3	60	40	100	3	1	-	4
EUREC502 /EIREC502	Digital Communications	CE	3	60	40	100	3	1	-	4
EUREC503	Microwave Engineering	CE	3	60	40	100	3	1	-	4
EUREC504	Data Structures and Algorithms	CE	3	60	40	100	3	1	-	4
EUREC505	Antennas & Wave Propagation	CE	3	60	40	100	3	1	-	4
EUREC506	Linear Integrated Circuits	CE	3	60	40	100	3	1	-	4
EUREC511	Communication Systems lab	CE	2	-	100	100	-	-	3	3
EUREC512	Microprocessor Lab	CE	2	-	100	100	-	-	3	3
EUREC513	Electronic Circuit Simulation Lab	CE	2	-	100	100	-	-	3	3
Total			**24**	**360**	**540**	**900**	**18**	**6**	**9**	**33**

B.Tech. (ECE) – VI SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREC601/ EIREC601	Radar Engineering	CE	3	60	40	100	3	1	-	4
EUREC602	Digital Signal processing	CE	3	60	40	100	3	1	-	4
EUREC603	VLSI System Design	CE	3	60	40	100	3	1	-	4
EUREC604	Computer Architecture & Organization	CE	3	60	40	100	3	1	-	4
EUREC605/ EIREC604/ EUREI605	Engg. Economics & Management	HS	3	60	40	100	3	1	-	4
EUREC606	Electronic Measurements & Instrumentation	CE	3	60	40	100	3	1	-	4
EUREC611	Digital Signal Processing lab	CE	2	-	100	100	-	-	3	3
EUREC612	Linear ICs lab	CE	2	-	100	100	-	-	3	3
EUREC613	Personality Development	HS	Non Credit Audit Course							
Total			**22**	**360**	**440**	**800**	**18**	**6**	**6**	**30**

B.Tech. (ECE) – VII SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREC701	Satellite Communications	CE	3	60	40	100	3	1	-	4
EUREC702	Environmental Studies	HS	4	60	40	100	4	1	-	5
EUREC703	Advanced Communication Systems	CE	3	60	40	100	3	1	-	4
EUREC721-725	Departmental Elective I	DE	4	60	40	100	3	1	-	4
EUREC731-735	Departmental Elective II	DE	4	60	40	100	3	1	-	4
EUREC711	VHDL / Verilog Simulation Laboratory	CE	2	-	100	100	-	-	3	3
EUREC712	Advanced Communication Systems Lab	CE	2	-	100	100	-	-	3	3
EUREC713	Project	PW	3	-	100	100	-	-	6	6
EUREC714	Industrial Training	IT	2	-	100	100	-	-	-	-
Total			**27**	**300**	**600**	**900**	**16**	**5**	**12**	**33**

B.Tech. (ECE) – VIII SEMESTER

Course Code	Name of the Course	Category	Credits	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREC821 - 824	Departmental Elective III	DE	4	60	40	100	3	1	-	4
EUREC831 - 835	Departmental Elective IV	DE	4	60	40	100	3	1	-	4
EUREC841 - 844	Departmental Elective V	DE	4	60	40	100	3	1	-	4
EUREC851 -859 EUREC8510-8513	Inter-Departmental Elective-I	IE	4	60	40	100	3	1	-	4
EUREC861-8610	Inter-Departmental Elective II	IE	4	60	40	100	3	1	-	4
EUREC811	Modern Communications Lab	CE	2	-	100	100	-	-	3	3
EUREC812	Project	PW	5	50	50	100	-	-	9	9
EUREC813	Comprehensive Viva	CE	2	100	-	100	-	-	-	-
Total			**29**	**450**	**350**	**800**	**15**	**5**	**12**	**32**

** 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 the student may select a course.

L – Lectures T – Tutorials D – Drawing P – Practicals

B.Tech. (ECE) Departmental Electives

DEPARTMENTAL ELECTIVE –I

Course Code	Name of the Course	Category	Credits
EUREC721	Television Engineering	DE	4
EUREC722	Microcontrollers & Applications	DE	4
EUREC723	Speech Processing	DE	4
EUREC724	Digital Control systems	DE	4
EUREC725	Digital Design Through Verilog	DE	4

DEPARTMENTAL ELECTIVE -II

Course Code	Name of the Course	Category	Credits
EUREC731	Digital Image Processing	DE	4
EUREC732	Fiber Optic Communications	DE	4
EUREC733/EIRDS702	Advanced Digital Signal Processing	DE	4
EUREC734	Tele Communication Switching Systems and networks	DE	4
EUREC735	Operating Systems	DE	4

DEPARTMENTAL ELECTIVE -III

Course Code	Name of the Course	Category	Credits
EUREC821/EIREC 801	Embedded Systems	DE	4
EUREC822	Advanced Computer Architecture	DE	4
EUREC823	DSP Systems And Architecture	DE	4
EUREC824	Wireless Communications and Networks	DE	4

DEPARTMENTAL ELECTIVE -IV

Course Code	Name of the Course	Category	Credits
EUREC831	Global Positioning Systems	DE	4
EUREC832	Microwave Networks	DE	4
EUREC833	Information Theory & Coding	DE	4
EUREC834	Electromagnetic Interference And Compatibility	DE	4
EUREC835/ EIRVD833/ EIRDS801/ EIRRM834	DSP Processors & Architectures	DE	4

DEPARTMENTAL ELECTIVE -V

Course Code	Name of the Course	Category	Credits
EUREC841	Mobile Communications& Networks	DE	4
EUREC842	Adaptive Signal Processing Techniques	DE	4
EUREC843	Mobile Computing	DE	4
EUREC844	Computer Networks	DE	4

B.Tech. (ECE)
INTER-DEPARTMENTAL ELECTIVE - I

Course Code	Name of the Course
EUREC851	Remote Sensing & GIS
EUREC852	Database Management Systems
EUREC853	Software Engineering
EUREC854	Systems Modeling & Simulation
EUREC855	Software Project Management
EUREC856	Artificial Intelligence
EUREC857	Transducers & Signal Conditioning
EUREC858	Biomedical Instrumentation
EUREC859	Power Electronics
EUREC8510	Project Planning and Management
EUREC8511	Neural Networks
EUREC8512	Introduction to Micro Electro Mechanical Systems (MEMS)
EUREC8513	Entrepreneurship

INTER-DEPARTMENTAL ELECTIVE - II

Course Code	Name of the Course
EUREC861	Environmental Impact Assessment
EUREC863	Web Technologies
EUREC864	Industrial Electronics
EUREC865	Computer Aided Design
EUREC866	Robotics and Automation
EUREC867	Mechatronics
EUREC868	Education Research & Methodologies
EUREC869	Professional Ethics
EUREC8610	Nanotechnology

B.Tech. (ECE)

Details of category wise credits allocated are as follows

S.No.	Category	Course Code	Allocated Credits
01.	Humanities & Social	HS	15
02.	Sciences	BS	18
03.	Basic Sciences	MT	13
04.	Mathematics	BE	27
05.	Basic Engineering	CE	85
06.	Core Engineering	DE	20
07.	Departmental Electives	IE	08
08.	Inter-Departmental Elective	PW	08
09.	Project Work	IT	02
	Industrial Training		
Total			196

SYLLABUS
B.Tech. (ECE) – 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, 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, 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. (ECE) – 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 Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURMT 102/EIRMT 102	MT	4	---	3	60	40	4

UNIT I

First order Differential Equations

Formation – Variables separable – 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.

B.Tech. (ECE) – I SEMESTER
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. (ECE) – 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 Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		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. (ECE) – 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. (ECE) – 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 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. (ECE) – 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.

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 aprogram 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. (ECE) – I SEMESTER
EURIE115: ENGINEERING GRAPHICS PRACTICE

Course code	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.	
EURIE 115	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

B.Tech. (ECE) – II SEMESTER
EUREG 201: ENGINEERING ENGLISH-II

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.	
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. Jayashree Mohanraj et al., Speak Well, Orient Black Swan, 2011.
3. Oxford Advanced Learners' Dictionary, 2010 Edition.

B.Tech. (ECE) – II SEMESTER

EURMT202: HIGHER ENGINEERING MATHEMATICS – I

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.	
EURMT202/EIRMT 202	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, B.S Grewal,Khanna Publishers.

Reference Books :

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, M.K.Venkata Raman. National Pub.Co.

B.Tech. (ECE) – II SEMESTER
EURMT203: HIGHER ENGINEERING MATHEMATICS – II

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.	
EURMT203/ EIRMT203	MT	3+1	---	3	60	40	3

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, 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, M.K.Venkata Raman. National Pub.Co.

B.Tech. (ECE) – II SEMESTER
EURPH 204: ENGINEERING PHYSICS – 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.	
EURPH 204	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. (ECE) – 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. (ECE) – 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/e by Ashok Kamthane
3. Problem Solving, Abstraction, and Design using C++ (6th) Frank L. Friedman

B.Tech. (ECE) – II SEMESTER
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 Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		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 and out 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. (ECE) – 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 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. (ECE) – II SEMESTER

EUREE 217: ELECTRICAL & ELECTRONIC WORKSHOP LAB

Category	L	T	P	Total hours	Marks			Credits
					Con. Eval.	End exam	Total	
EUREE 217	-	-	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

B.Tech. (ECE) – III SEMESTER

EUREC301/EIREC301/EUREI301/EUREE301:

ADVANCED ENGINEERING MATHEMATICS

Category: MT Credits: 3 Hours: 4 per week Department: ECE

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. (ECE) – III SEMESTER
EUREC302/EIREC302: SIGNALS AND SYSTEMS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Signals and Systems. Continuous-Time and Discrete-Time Signals. Transformations of the Independent Variable. Exponential and Sinusoidal Signals. The Unit Impulse and Unit Step Functions. Continuous-Time and Discrete-Time Systems. Basic System Properties.

UNIT II

Discrete-Time LTI Systems: The Convolution Sum. Continuous-Time LTI Systems: The Convolution Integral. Properties of Linear Time-Invariant Systems. Causal LTI Systems Described by Differential and Difference Equations. Singularity Functions.

UNIT III

Fourier Series Representation of Periodic Signals: A Historical Perspective. The Response of LTI Systems to Complex Exponentials. Fourier Series Representation of Continuous-Time Periodic Signals. Convergence of the Fourier Series. Properties of Continuous-Time Fourier Series. Fourier Series Representation of Discrete-Time Periodic Signals. Properties of Discrete-Time Fourier Series. Fourier Series and LTI Systems. Filtering. Examples of Continuous-Time Filters Described by Differential Equations. Examples of Discrete-Time Filters Described by Difference Equations. Continuous-Time Fourier Transform: Representation of Aperiodic Signals: The Continuous-Time Fourier Transform. The Fourier Transform for Periodic Signals. Properties of the Continuous-Time Fourier Transform. The Convolution Property. The Multiplication Property. Tables of Fourier Properties and Basic Fourier Transform Pairs. Systems Characterized by Linear Constant-Coefficient Differential Equations.

UNIT IV

The Discrete-Time Fourier Transform: Representation of Aperiodic Signals: The Discrete-Time Fourier Transform. The Fourier Transform for Periodic Signals. Properties of the Discrete-Time Fourier Transform. The Convolution Property. The Multiplication Property. Tables of Fourier Transform Properties and Basic Fourier Transform Pairs. Duality. Systems Characterized by Linear Constant-Coefficient Difference Equations. Time- and Frequency Characterization of Signals and Systems: The Magnitude-Phase Representation of the Fourier Transform. The Magnitude-Phase Representation of the Frequency Response of LTI Systems. Time-Domain Properties of Ideal

Frequency-Selective Filters. Time- Domain and Frequency-Domain Aspects of Nonideal Filters.

UNIT V

The Laplace Transform. The Region of Convergence for Laplace Transforms. The Inverse Laplace Transform. Geometric Evaluation of the Fourier Transform from the Pole-Zero Plot. Properties of the Laplace Transform. Some Laplace Transform Pairs. Analysis and Characterization of LTI Systems Using the Laplace Transform. System Function Algebra and Block Diagram Representations. The Unilateral Laplace Transform. The Z-Transform: The z-Transform. The Region of Convergence for the z-Transform. The Inverse z-Transform. Geometric Evaluation of the Fourier Transform from the Pole-Zero Plot. Properties of the z-Transform. Some Common z-Transform Pairs. Analysis and Characterization of LTI Systems Using z-Transforms. System Function Algebra and Block Diagram Representations. The Unilateral z-Transforms.

Text Books:

1. Signals and systems, Alan V. Oppenheim, Alan S. Willsky 2/e, Pearson Education
2. Signals & Systems, P Ramakrishna Rao, Tata Mc Graw Hill, 2008.

Reference Books:

1. Signals & Systems, B P Lathi, B S Publishers
2. Signals & Systems, P Ramesh Babu, Scitech.
3. Signals & Systems, Nagrath, Sharan, Rajan et. Al, TMH.
4. Signals & Systems, Sanjay Sarma, S K Kataria

B.Tech. (ECE) – III SEMESTER
EUREC303: BASIC CIRCUIT THEORY

Category: BE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Charge, Current, Voltage and Power, Voltage and Current sources, Ohms law. Voltage and Current Laws: Nodes, Paths, Loops, Branches. Krichoff's Current Law, Kirchoffs Voltage Law, Single Loop Circuit, Single Node Pair Circuit, Series and Parallel connected independent sources. Resistors in series and parallel. Voltage and Current Division. Basic Nodal and Mesh Analysis: Nodal Analysis, Super Node, Mesh Analysis, Super Mesh, Nodal vs Mesh Analysis comparison. Useful Circuit Analysis Techniques: Linearity and Superposition, Source Transformations, Thevenins and Nortons equivalent circuits, Maximum Power Transfer. Delta – Wye conversion

UNIT II

Capacitors and Inductors: Capacitor, Inductor, Inductance and Capacitance combinations. Consequences of Linearity. Basic RL and RC Circuits: Source free RL circuits, Properties of the exponential response. Source Free RC Circuit, The unit step function, driven RL circuits. Natural and Forced Response. Driven RC Circuits. The RLC Circuit: The source free parallel circuits. The overdamped parallel RLC circuit. Critical Damping. The Underdamped parallel RLC circuit. The source free series RLC circuit. Complete response of the RLC circuit. The lossless LC circuit

UNIT III

Sinusoidal Steady-State Analysis: Characteristics of sinusoids, forced response to sinusoidal functions, the complex forcing function. The Phasor, Phasor relationships for R, L and C. Impedance, Admittance, Nodal and Mesh analysis. Phasor diagrams. AC Circuit Power Analysis: Instantaneous Power, Average Power, Effective values of current and voltage. Apparent power and power factor, complex power.

UNIT IV

Magnetically Coupled Circuits: Mutual Inductance, Energy considerations, The Linear transformer, Ideal transformer. Complex Frequency and The Laplace Transform: Complex frequency, The damped sinusoidal forcing function. Definition of Laplace transform, Laplace transforms of simple time functions. Inverse transform techniques and Circuit Analysis in the s-Domain: Z(s) and Y(s). Node and Mesh analysis in the s-Domain.

UNIT V

Frequency Response: Poles, Zeros and Transfer functions, Convolution, The complex frequency plane. Parallel resonance, More about parallel resonance. Series resonance. Other resonant forms. Scaling. Bode diagrams, Filters. Two port networks: One port networks, admittance parameters, some equivalent networks, impedance parameters, hybrid parameters and transmission parameters.

Text Books:

1. William H. Hayt Jr. and Jack E. Kemmerly, 'Engineering Circuit Analysis', 7th Edition, McGraw Hill Publications, 2007
2. Vanvalkenburg M.E, 'Network Analysis', Prentice Hall India Publications
3. Basic Engineering Circuit Analysis, 9th Edition, Wiley Publications.

Reference Books

1. 'Network Theory', .Sudhakar & Syammohan, TMH
2. Ryder, J.D. 'Networks, lines and fields' , Prentice Hall, 2nd Ed,1991
3. Networks and Transmission lines, T. Anil Kumar, Pearson Education

B.Tech. (ECE) – III SEMESTER
EUREC304: ELECTRONIC DEVICES AND CIRCUITS

Category: BE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Introduction to Electronics: Introduction, Signals, Frequency Spectrum of Signals, Analog and Digital Signals, Amplifiers, Circuit Models for Amplifiers, Frequency Response of Amplifiers, Digital Logic Inverters.

UNIT II

Diodes: The Ideal Diode, Terminal Characteristics of Junction Diodes, Modeling the Diode Forward Characteristic, Operation in the Reverse Breakdown Region--Zener Diodes, Rectifier Circuits, Limiting and Clamping Circuits, Physical Operation of Diodes, Special Diode Types.

UNIT III

MOS Field-Effect Transistors: Device Structure and Physical Operation, Current -Voltage Characteristics, MOSFET Circuits at DC, The MOSFET as an Amplifier and as a Switch, Biasing in MOS Amplifier Circuits, Small-Signal Operation and Models, Single-Stage MOS Amplifiers, The MOSFET Internal Capacitances and High-Frequency Model, Frequency Response of the CS Amplifier, The Depletion-Type MOSFET.

UNIT IV

Bipolar Junction Transistors: Device Structure and Physical Operation, Current-Voltage Characteristics, The BJT as an Amplifier and as a Switch, BJT Circuits at DC, Biasing in BJT Amplifier Circuits, Small-Signal Operation and Models, Single-Stage BJT Amplifiers, The BJT Internal Capacitances and High-Frequency Model, Frequency Response of the Common-Emitter Amplifier.

UNIT V

Operational Amplifiers: The Ideal Op Amp, The Inverting Configuration, The Non-inverting Configuration, Difference Amplifiers, Effect of Finite Open-Loop Gain and Bandwidth on Circuit Performance, Large-Signal Operation of Op Amps, DC Imperfections.

Text Book:

1. Microelectronic Circuits by Sedra / Smith, Fifth edition, Oxford University Press, 2006.

Reference Books:

1. Fundamentals of Microelectronics by Behzad Razavi, Wiley Publications, 200.
2. Integrated Electronics Analog and Digital Circuits, Jacob Millman and Christos C. Halkias, McGraw Hill.
3. Electronic Devices and Circuits – RL Boylestad & Louis Nashelsky, Pearson Education.
4. Electronic Devices & Circuits, Dharma Raj Cheruku & B T Krishna, 2nd edition, Pearson Education, 2008.

B.Tech. (ECE) – III SEMESTER
EUREC305/EIREC305: ELECTRICAL MACHINES

Category: BE Credits: 3 Hours: 4 per week Department: ECE

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 Induction Motors: Construction, Rotating Magnetic Field and 3ph 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, and capacitor run, shaded pole motors, Universal Motor, Stepper Motor.

Text Books:

1. Electrical Machines, S. K. Bhattacharya, TMH Publications N. Delhi.
2. Electrical Machines – P S Bhimbra.

B.Tech. (ECE) – III SEMESTER

EUREC306/ EIREC306: ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

Category: CE Credits: 3 Hours:4 per week Department: ECE

UNIT I

Electrostatic Fields: Coulomb's law, Field due to different Charge Distributions, Gauss' law in Integral and Point Form, Concept of Electric Flux Density, Potential Gradient, Conductors & Dielectrics,Concept of Polarization, boundary conditions, Energy stored in Electrostatic field, Poisson's and Laplace Equations and their Applications, Capacitors, Uniqueness theorem, Method of Images.

UNIT II

Magnetostatic Fields: Steady current, Current distributions, Biot – Savart law, Ampere's Circuital law in Integral and Differential form, Force on Current Elements, Magnetic Potentials, Concept of Magnetic Flux Density, Energy stored in Magnetic Field, Fields in Magnetic Materials – Concept of Magnetization, Self and Mutual Inductances, boundary conditions.

UNIT III

Electromagnetic Fields: Maxwell's Equations in both Differential and Integral form, Phasor representation of Time – Varying Fields, Displacement Current Density, Conduction Current Density, Boundary Conditions, Poynting Theorem and Applications, Retarded Potentials, Electromagnetic field in Conductors and Dielectrics, Depth of Penetration, Polarization.

UNIT IV

Electromagnetic Waves: Wave Equations, Uniform Plane Wave, Reflection and Refraction of Plane wave, Normal and Oblique Incidence, Surface Impedance.

UNIT V

Transmission Lines: Transmission Line parameters, Transmission Line equations, Transmission Line examples, Input impedance, Characteristic impedance, Reflection coefficient, VSWR, RF lines. Graphical methods and applications: Smith chart- construction, application, measurement of VSWR, impedance, reflection coefficient, quarter wave transformer, single and double stub matching techniques.

Text books:

1. Engineering Electromagnetics, W. H. Hayt Jr., McGraw Hill – New York, 5th edition
2. EM Waves and Radiating Systems, E. C. Jordan PHI, 2nd edition,2007
3. Principles of Electromagnetics, M.N.O.Sadiku, 4th Edition, Oxford Press, 2010

Reference Books:

1. Electromagnetic Field Theory And Transmission Lines, Gottapu Sasibhushana Rao, WILEY India, New Delh, 2012.
2. Electromagnetics with Applications, Kraus and Fleisch, McGraw Hill, 1999.
3. Field and wave Electromagnetics, David.K.Cheng, Pearson Education, 2003.
4. Electromagnetic Waves by R. Shivagoenkar, TMH Publications.

B.Tech. (ECE) – III SEMESTER

EUREC311: NETWORKS AND ELECTRICAL MACHINES LABORATORY

Category: BE Credits: 2 Hours: 3 Hrs Department: ECE

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. Swimburne'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. (ECE) – III SEMESTER

EUREC312: ELECTRONIC DEVICES AND CIRCUITS LABORATORY

Category: BE Credits: 2 Hours: 3 per week Department: ECE

- Breadboard practice.
- Soldering practice.
- Study of CRO.

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. Clipping and Clamping Circuits using Diodes
7. Input and Output Characteristics of BJT Transistor
8. Characteristics of CB Configuration
9. Characteristics of CE Configuration
10. Analysis of Emitter Follower
11. Input and Output Characteristics of NMOS and PMOS Transistor
12. Input and Output Characteristics of Bipolar Amplifier
13. Input and Output Characteristics of MOS Amplifier

B.Tech. (ECE) – IV SEMESTER
EUREC401/EIREC401 : DIGITAL LOGIC DESIGN

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Number Systems: Digital Systems. Binary Numbers. Number Base Conversions. Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers. Binary Codes. Binary Storage and Registers. Binary Logic. Boolean Algebra and Logic Gates. Basic Definitions. Axiomatic Definition of Boolean Algebra. Basic Theorems and Properties of Boolean Algebra. Boolean Functions. Canonical and Standard Forms. Other Logic Operations. Digital Logic Gates. Integrated Circuits.

UNIT II

Gate-Level Minimization: The Map Method. Four-Variable Map.Five-Variable Map.Product of Sums Simplification.Don't-Care Conditions. NAND and NOR Implementation. Other Two-Level Implementations.Exclusive-OR Function. Combinational Logic: Combinational Circuits. Analysis Procedure. Design Procedure. Binary Adder-Subtractor. Decimal Adder. Binary Multiplier.Magnitude Comparator.Decoders.Encoders.Multiplexers.

UNIT III

Synchronous Sequential Logic: Sequential Circuits. Latches.Flip-Flops.Analysis of Clocked Sequential Circuits.HDL For Sequential Circuits.State Reduction and Assignment. Design Procedure. Registers ad Counters: Registers. Shift Registers. Ripple Counters. Synchronous Counters.Other Counters.HDL for Registers and Counters.

UNIT IV

Memory and Programmable Logic: Introduction. Random-Access Memory.Memory Decoding.Error Detection and Correction.Read-Only Memory.Programmable Logic Array.Programmable Array Logic. Sequential Programmable Devices

UNIT V

Asynchronous Sequential Logic :Introduction. Analysis Procedure. Circuits With Latches. Design Procedure. Reduction of State and Flow Tables.Race-Free State Assignment.Hazards. Design Example. Digital Integrated Circuits: Introduction. Special Characteristics.Bipolar-Transistor Characteristics.RTL and DTL Circuits.Transistor-Transistor Logic (TTL).Emitter-Coupled Logic (ECL).Metal-Oxide Semiconductor (MOS).Complementary MOS (CMUS).CMOS Transmission Gate Circuits.

Text Books:

1. Switching and finite automata theory, 2nd Ed, Zvi Kohavi, Tata McGraw-Hill ,
2. Digital Design, Morris Mano, Michael D. Ciletti 4/e. Pearson Education
3. Digital Design by John F. Wakerly, 4th edition, PHI

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.
3. Engineering Approach to Digital Design by Fletcher, Pearson Education

B.Tech. (ECE) – IV SEMESTER
EUREC402: ANALOG ELECTRONIC CIRCUITS

Category: CE Credits:3 Hours: 4 per week Department: ECE

UNIT I

Single-Stage Integrated-Circuit Amplifiers: IC Design Philosophy, Comparison of the MOSFET and the BJT, IC Biasing--Current Sources, Current Mirrors and Current-Steering Circuits, High-Frequency Response--General Considerations, The Common-Source and Common-Emitter Amplifiers with Active Loads, The Common-Emitter Circuit

UNIT II

High-Frequency Response of the CS and CE Amplifiers, The Common-Gate and Common-Base Amplifiers with Active Loads, The Cascode Amplifier, The CS and CE Amplifiers with Source (Emitter) Degeneration, The Source and Emitter Followers, Some Useful Transistor Pairings, Current-Mirror Circuits with Improved Performance.

UNIT III

Differential and Multistage Amplifiers: The MOS Differential Pair, Small-Signal Operation of the MOS Differential Pair, the BJT Differential Pair, Other Non-ideal Characteristics of the Differential Amplifier, the Differential Amplifier with Active Load, Frequency Response of the Differential Amplifier, Multistage Amplifiers.

UNIT IV

Feedback: The General Feedback Structure, Some Properties of Negative Feedback, the Four Basic Feedback Topologies, the Series-Shunt Feedback Amplifier, the Series-Series Feedback Amplifier, the Shunt-Shunt and Shunt-Series Feedback Amplifiers, Determining the Loop Gain.

UNIT V

Output Stages and Power amplifiers: Classification of output stages, class A output stage, class B output stage, Class AB output stage, biasing the Class AB output stage, power BJTs, variation on the Class AB configuration, IC power amplifiers, MOS power transistors.

Text Books:

1. Sedra and Smith, Microelectronics 5/e, Oxford Publications, 2007
2. Milliman & Halkias, Integrated Electronics, Tata McGraw Hill Publications

Reference Books:

1. Electronic Devices and Circuits – RL Boylestad & Louis Nashelsky, Pearson Education.
2. Electronic Devices & Circuits, Dharma Raj Cheruku & B T Krishna, 2/e Pearson Education, 2005.
3. Behzad Razavi, Fundamentals of Microelectronics by Wiley Publications, 2009

B.Tech. (ECE) – IV SEMESTER
EUREC403/EIREC403: ANALOG COMMUNICATIONS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Signals and Signal Space: Size of a Signal, Classification of Signals, Unit Impulse Signal, Signals vs Vectors, Correlation of Signals, Orthogonal Signal Set, Exponential Fourier Series. Analysis and Transmission of Signals: Aperiodic signal representation by Fourier integral, Transforms of useful functions, Some Properties of the fourier transform, Signal Transmission through a linear system, Ideals vs practical filters, Signal distortion over a communication channel, Signal energy and energy spectral density, signal power and power spectral density, Numerical computation of the fourier transform: the DFT.

UNIT II

Amplitude Modulation and Demodulation: Need for modulation. Baseband vs carrier communications, Double Sideband amplitude modulation, Amplitude modulation, Bandwidth efficient amplitude modulation, Vestigial Sideband modulation, Local carrier synchronization, Frequency division multiplexing, Phase locked loop and its applications.

UNIT III

Angle Modulation and Demodulation: Nonlinear modulation, Bandwidth of angle modulated waves, Generating FM waves, Demodulation of FM signals, Effects of nonlinear distortion and interference, superheterodyne analog AM/FM receivers. FM Broadcasting systems.

UNIT IV

Noise: Sources of noise, thermal noise, shot noise flicker noise, white noise, mathematical representation of noise, power spectral density, effect of filtering on noise power spectral density, linear filtering, noise bandwidth, quadrature representation of noise and their power spectral density, noise figure, effective noise temperature, noise calculations for cascade stages.Noise in AM and FM: Signal power, Noise power, Signal to noise ratio for DSBSC, SSB and FM, FM threshold effect.

UNIT V

TRANSMITTERS : Radio Transmitter - Classification of Transmitter, AM Transmitter, Effect of feed back on performance of AM Transmitter, FM Transmitter – Variable reactance type and phase modulated FM Transmitter, frequency stability in FM Transmitter. RECEIVERS : Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.

Text Books:

1. Modern Digital and Analog Communications Systems 4/e B. P. Lathi, BSP
2. Principles of communication H. Taub and Schilling McGraw Hill.
3. Electronic Communications – Dennis Roddy and John Coolean , 4th Edition, PEA, 2004

Reference Books:

1. Electronic Communication Systems G. Kennedy, McGraw Hill.
2. Communication Systems by Bruce Carlson
3. Communications Systems 4/e Simon Haykins, Wiley Publications
4. Analog communications P.Rama Krishna Rao Tata Mc.Graw Hill 2011

B.Tech. (ECE) – IV SEMESTER

EUREC404/EIREC404: PROBABILITY THEORY AND RANDOM PROCESSES

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Probability: Probability introduced through Sets and Relative Frequency, Joint and Conditional Probability, Independent Events, Combined Experiments, Bernoulli Trials.

UNIT II

The Random Variable: Introduction, Random Variable Concept, Distribution Function, Density Function, The Gaussian Random Variable, Other distribution and density examples, conditional distribution and density functions. Operation on One Random Variable – Introduction, Expectation, Moments, Functions that give moments, Transformations of a Random Variable

UNIT III

Multiple Random Variables : Vector Random Variables, Joint Distribution and density functions, Properties, Conditional Distribution and Density, Statistical Independence, Distribution and density of a sum of random variables, Central Limit Theorem, (Proof not expected). Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case.

UNIT IV

Random Processes – Temporal Characteristics :The Random Process Concept, Stationarity and Statistical Independence, Correlation Functions, Gaussian Random Processes, Poisson Random Process

UNIT V

Random Processes – Spectral Characteristics : The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function Linear Systems With Random Inputs : Random Signal Response of Linear Systems: System Response – Convolution, Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, Spectral Characteristics of System Response: Power Density Spectrum of Response

Text Books :

1. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, TMH, 4th Edition, 2001.
2. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, PHI, 4th Edition, 2002.

Reference Books:

1. Communication Systems – 3rd Edition Simon Haykin, TMH, 1995.
2. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W. Woods, Pearson Education, 3rd Edition.
3. Probability Theory and Random Processes - S.P. Eugene Xavier, SChand Publications, 2003

B.Tech. (ECE) – IV SEMESTER

EUREC405: FILTERS AND WAVESHAPING CIRCUITS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Passive Filter Design: Introduction. Filter Transmission, Types and Specification. The Filter Transfer function.Butterworth and Chebyshev Filters. First Order and Second Order Filter Functions. The Second Order LCR Resonator.

UNIT II

Active Filter Design and Tuned Amplifiers: Second Order Active Filters based on Inductor Replacement. Second Order Active Filters based on the two integrator loop topology. Single Amplifier Biquadratic Active Filters. Sensitivity.Switched Capacitor Filters. Tuned Amplifiers

UNIT III

Waveshaping Circuits: Integrators and Differentiators: Nonlinear function operations: logarithmic amplifiers, antilogarithmic amplifiers, analog multipliers, sample and hold circuits. Linear halfwave rectifiers, precision rectifiers, peak detectors, ac-to-dc converters, dead zone circuits, precision clipper.Nonlinear Waveshaping circuits.Precision Rectifier Circuits.

UNIT IV

Oscillators: Basic Principles of Sinusoidal Oscillators. Op Amp RC Oscillator Circuits.LC and Crystal Oscillators.Multivibrators: Bistable Multivibrators, Monostable Multivibrators, Astable multivibrators.

UNIT V

Sweep Generators: Voltage time base generators: Different sweep circuits, Exponential charging circuit, Miller sweep, Bootstrap sweep, Analysis & design of a VTBG. Current Time Base generators.Synchronization & Frequency Division: Pulse Synchronization, Frequency Division in Sweep circuit, Synchronization of sweep circuit with symmetrical signals, Sine wave frequency division with sweep circuit.

Text Books:

1. Microelectronic Circuits 5/e Sedra and Smith, Oxford University Press.
2. Pulse & Digital Switching Waveforms, Taub & Schilling, TMH Publications
3. Design of Analog Filters, Rolf Schaumann, Van Valkenburg, Oxford University Press.

B.Tech. (ECE) – IV SEMESTER
EUREC406/EIREC406: CONTROL SYSTEMS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Transfer functions of linear systems: Impulse Response of linear systems, Block diagrams of control systems, signal flow graphs(simple problems), reduction techniques for complex block diagrams and signal flow graphs. Introduction mathematical modeling of physical systems, Equations of electrical networks, modeling of Mechanical systems, equations of 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, Introduction to PD, PI and PID Controllers, effect of derivative and integral control on transient and steady state performance of feedback control systems.

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, 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, concept of controllability and observability.

Text books:

1. Control Systems Engineering. I.J.Nagarath and M.Gopal, Wiley Eastern ltd
2. Control Systems-A.Nagoorkani, RBA Publications, 1998

Reference Books:

1. Modern Control Engineering, Ogata, PHI publication
2. Automatic Control Systems, Benjamin C. Kuo, PHI publication.

B.Tech. (ECE) – IV SEMESTER
EUREC411: DIGITAL LOGIC DESIGN LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

1. Minimization and realization of a given function using gates
2. Function generation using deCoders and multiplexers
3. Experiments on priority enCoder using 74LS148
4. Applications of multiplexers
5. Seven-segment display experiments
6. Four bit and eight bit adders and subtractors
7. Experiments using 74LS181 and 74LS182 ICs (ALU and Carry look ahead adders)
8. Experiments on SR latch and Master-Slave JK flip-flops using SSI gates
9. Design and testing of ripple counters using ICs (binary and mod-N)
10. Design and testing of Mod-N synchronous counters
11. Design and testing of Shift registers, Ring and Johnson Counters
12. Experiments using ROMs
13. Study of Programmable Logic Devices

B.Tech. (ECE) – IV SEMESTER
EUREC412: ANALOG ELECTRONICS & PULSE CIRCUITS LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

PART 'A'

Minimum of FIVE experiments to be conducted from the following:

1. Feedback Amplifier - Calculation of Gain, Input Resistance, Output Resistance with and without feedback, Frequency Response Characteristic.
2. Colpitts Oscillator.
3. RC Phase - Shift Oscillator.
4. Wien - Bridge Oscillator.
5. Class A Power Amplifier
6. Class B Push - Pull Power Amplifier.
7. Tuned Voltage Amplifier.

PART 'B'

Minimum of FIVE experiments to be conducted from the following:

1. RC Differentiator & RC Integrator.
2. Clipping Circuits.
3. Clamping Circuits.
4. UJT Voltage Sweep Generator.
5. Bisatble Multivibrator
6. Monostable multivibrator
7. Astable Multivibrator

B.Tech. (ECE) – IV SEMESTER
EUREC413: ADVANCED COMMUNICATION SKILLS & ENGLISH LANGUAGE LABORATORY

Category: HS Credits: 2 Hours: 3 per week Department: BSH

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. 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. 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.
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. (ECE) – IV SEMESTER
EUREC414: INDUSTRIAL TOUR

Category: IT Credits: Non Credit Course

Remarks:

- The student will visit core industries like VLSI, Telecom, Signal Processing, Electronics Engineering, Software Engineering, Instrumentation, etc or related research establishments.
- The industries to be visited should be from the approved list by the Head of the Department.
- At least 4 industries are to be visited by the student
- The duration of the Industrial tour would be week to ten 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 ten days of return from the tour.

B.Tech. (ECE) – V SEMESTER

EUREC501/EIREC501: MICROPROCESSORS AND INTERFACING

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I:

8086- ARCHITECHTURE, PIN DIAGRAMS AND TIMING DIAGRAMS:Register Organization, Architecture, Signal description of 8086, Physical Memory Organization, General Bus organization, I/O Addressing Capability, Special Processor Activities, Minimum Mode and Maximum Mode Systems and Timings.

UNIT II:

8086 - INSTRUCTION SET AND ASSEMBLER DIRECTIVES: Machine Language Instruction Formats, Addressing Modes, Instruction Set, Assembler Directives and Operators, a Few Machine Level programs, Machine Coding the Programs, Programming the Assembler, Assembly Language Example Programs.

UNIT III:

BASIC PERIPHERALS AND THEIR INTERFACING WITH 8086:Semi conductor Memory Interfacing, Dynamic RAM Interfacing, Interfacing I/O Ports, PIO 8255, Modes of Operation of 8255, Interfacing A/D converters, Interfacing D/A converters, Stepper motor Interfacing, Programmable Communication interface 8251 USART.

UNIT IV:

INTERRUPTS AND PROGRAMMING: Introduction to Stack, Stack Structure of 8086, Interrupts and Interrupt Service Routines, Instruction Cycle of 8086, Non Mask able Interrupt, Mask able interrupt, Interrupt Programming, Passing Parameters to Procedures, Handling Programs of Size more than 64k, Programmable Interrupt controller 8259, Programmable interval Timer 8253, DMA Controller 8257

UNIT V:

AN INTRODUCTION TO MICRO CONTOLLERS 8051:Intel Family of 8 Bit Micro Controllers, Architecture, Signal Description, Register Set of 8051, important operational features of 8051, Memory and I/O Addressing, Interrupts of 8051, Instruction set of 8051.

Text Books:

1. Advanced Microprocessors And Peripherals by A .K .RAY , K.M BHURCHANDI,TMH Publishers, 2006.

Reference Books:

1. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd edition.
2. Barry B. Brey, "The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, and Pentium processors. Architecture, programming and interfacing".
3. Douglas V Hall, "Microprocessors and Interfacing: Programming and Hardware", 2nd edition, TMH.
4. 8086 Micro Processor -Kenneth J. Ayala, Penram International/ Thomson, 1995.

B.Tech. (ECE) – V SEMESTER
EUREC502/EIREC502: DIGITAL COMMUNICATIONS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Pulse Modulation: Sampling Process, Pulse-Amplitude Modulation, Pulse-Position Modulation, Completing the Transition from Analog to Digital, Quantization Process, Pulse-Code Modulation, Delta Modulation, Differential Pulse-Code Modulation, Line Codes, Theme Examples.

UNIT II

Baseband Data Transmission: Baseband Transmission of Digital Data, The Intersymbol Interference Problem, The Nyquist Channel, Raised-Cosine Pulse Spectrum, Baseband Transmission of M-ary Data, The Eye Pattern, Theme Example: Equalization

UNIT III

Digital Band-Pass Modulation Techniques: Some Preliminaries, Binary Amplitude-Shift Keying, Phase-Shift Keying, Frequency-Shift Keying, Summary of Three Binary Signaling Schemes, Noncoherent Digital Modulation Schemes, M-ary Digital Modulation Schemes, Mapping of Digitally Modulated Waveforms onto Constellations of Signal Points, Theme Examples.

UNIT IV

Noise in Digital Communications: Bit Error Rate, Detection of a Single Pulse in Noise, Optimum Detection of Binary PAM in Noise, Optimum Detection of BPSK, Detection of QPSK and QAM in Noise, Optimum Detection of Binary FSK, Differential Detection in Noise, Summary of Digital Performance.

UNIT V

Information Theory: Uncertainty, Information and Entropy, Source Coding Theorem, Data compaction, Discrete Memoryless channels, Mutual Information, Channel Capacity, Channel coding theorem, Differential Entropy. Error Control Coding: Rationale for coding, Linear Block Codes, Cyclic Codes, Convolutional Codes, Maximum Likelihood Decoding of Convolutional Codes, Sequential Decoding.

Text Books:

1. Simon Haykin, Michael Moher, An Introduction to Analog and Digital Communications, 2nd Edition, Wiley Publications, 2006
2. Simon Haykin, Communication Systems, Fourth Edition, 2001

Reference Books:

1. John G. Proakis, Digital Communications, 5/e, Tata Mcgraw Hill Publications, 2010.
2. John Proakis and Salehi, Fundamentals of Communication Systems, Pearson Education, 2005
3. Herbert Taub & Schilling, Principles of Communication Systems, Tata McGraw Hill publications, 2007 revised edition
4. A. Bruce Carlson, Paul B. Crilly, Janet C. Rutledge, Communication Systems, Fourth Edition, Tata Mcgraw Hill publications, 2005.
5. P. Ramakrishna Rao, "Digital Communications", Tata McGrawhill, India, 2011

B.Tech. (ECE) – V SEMESTER
EUREC503: MICROWAVE ENGINEERING

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Introduction to Microwave components: Microwave Frequencies, Microwave Devices. Waves in rectangular wave guides and circular wave guides, Design considerations for microwave tubes, Velocity of propagation, Cavity resonators-Rectangular and Circular cavity resonators, Quality factor of cavity resonator. Introduction Micro strip Lines, Characteristic Impedance of Micro strip Lines, Losses in Micro strip Lines, Quality Factor Q of Micro strip Lines.

UNIT II

Microwave Tubes: High frequency limitations of conventional tubes, Reentrant cavities, Klystrons, velocity modulation process, bunching process, output power and beam loading. Multi cavity Klystron amplifiers. Applications. Reflex Klystron: Velocity modulation, power output and efficiency, electronic admittance, mode patterns. Slow wave structures, Traveling wave tube, amplification process, wave modes, gain considerations.

Microwave Crossed-Field Tubes : Magnetron - types, principle of operation of cylindrical magnetron, cavity magnetron, theory of oscillations, Hartee resonance condition: Pi-mode separation

UNIT III

Microwave Circuits and passive components: Concept of microwave circuit, normalized voltage and current. Introduction to scattering parameters & their properties, Faraday rotation, ferrite devices, gyrators, isolators, circulators and their properties, wave meters, Scattering matrix representation of microwave junctions, bends, directional couplers, wave guide tees, magic tee, attenuator, phase shifter

UNIT IV

Microwave Semiconductor Devices: Classification, GUNN diode principle of operation, Modes. IMPATT Diodes, Physical Structures, Negative Resistance, Power Output and efficiency, TRAPATT Diodes, Physical Structures, Principles of Operation, Power Output and Efficiency, PIN diode, varactor diode, parametric amplifiers, Tunnel diode, point contact diode, Schottky barrier diode, Microwave transistors,

UNIT V

Microwave Measurements: Introduction, microwave bench measurement setup, Frequency and wavelength measurements, measurement of power, VSWR, impedance, coupling & directivity of directional coupler, dielectric constant and phase shift constant.

Text books:

1. Microwave Devices and Circuits - Samuel Y. Liao, PHI
2. Microwave & Radar Engineering – M. Kulkarni.

Reference Book:

1. Microwave and Radar Engineering, Gottapu Sasibhushana Rao, Pearson Education, New Delhi, 2014
2. Foundations of Microwave Engineering.- R.E.Collins,Tata McGraw Hill Publications, 2007

B.Tech. (ECE) – V SEMESTER
EUREC504: DATA STRUCTURES AND ALGORITHMS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Data representation: introduction, linear lists, formula based representation, indirect addressing, simulating pointers, comparisons and applications. Arrays, matrices, special and sparse matrices, single linked list, double linked list, circular linked list. , Basics of time complexity

UNIT II

Stacks: definitions, operations and applications, array and linked representation of stacks. Queues: definitions and operations. Array and linked representation of queues. Applications.

UNIT III

Trees: definitions and properties, representation of binary trees, operations. Binary tree traversal.AVL trees and operations on AVL trees, B+ trees, operations on B+ trees and applications.

UNIT IV

Searching & Sorting: merge sort, quick sort, selection sort, heap sort. Complexity analysis. Sequential search, binary search. Various types of hashing.

UNIT V

Graphs: definitions and representation of graphs. Graph search methods. Applications.Applications, Spanning Tree, Minimum Spanning Tree, Prim's Algorithm, Kruskal's Algorithm.

Text Books:

1. Data Structures. Algorithms and Applications in C++, S.Sahani, Tata Mc-Graw Hill.
2. Date Strctures using C and C++, Yedidyah Langsam, MosheJ Augenstein Aaron M. Tenenbaum, Publisher: Prentice Hall India
3. C and Data Structures by E. Balaguruswamy
4. Data Structures – Schaums Outline Series

Reference Books:

1. An Introduction to data structures with applications – Trembly & Sorenson.
2. Data Structures and Algorithms, Aho, Ullman, Hopcroft, Addison Wesley Publications
3. Data Structures and Algorithm Analysis using C 2/e by Allen Weiss, Pearson Education, 1997
4. C The Complete Reference by Herbert Schildt
5. Sartaz Sahani McGraw – HillS.K. Srivatsava, Deepli Srivatsava. BPB Publications.

B.Tech. (ECE) – V SEMESTER
EUREC505: ANTENNAS & WAVE PROPAGATION

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT-I

Introduction to Antennas: Introduction, Types of Antennas, Radiation Mechanism, Current Distribution on a Thin Wire Antenna. **Fundamental Parameters of Antennas**: Introduction, Radiation Pattern, Radiation Power Density, Radiation Intensity, Beamwidth, Directivity, Numerical Techniques, Antenna Efficiency, Gain, Beam Efficiency, Bandwidth, Polarization, Input Impedance, Antenna Radiation Efficiency, Antenna Vector Effective Length and Equivalent Areas, Maximum Directivity and Maximum Effective Area, Friis Transmission Equation and Radar Range Equation, Antenna Temperature

UNIT-II

Radiation Integrals and Auxiliary Potential Functions: Introduction, The Vector Potential A for an Electric Current Source J, The Vector Potential F for a Magnetic Current Source M, Electric and Magnetic Fields for Electric (J) and Magnetic (M), Current Sources, Solution of the Inhomogeneous Vector Potential Wave Equation, Far-Field Radiation, Duality Theorem, Reciprocity and Reaction Theorems.

UNIT-III

Antennas for Communications and Radar Applications: Wire antennas: Short Dipole Half-Wave Dipole, Monopole, Small Loop Antenna. **Aperture Antennas:** Magnetic current and its fields, Sheet current distribution, Sheet current distribution in free space, General current distribution, aperture in a conducting screen. Slot Antenna, Open-ended Waveguide radiator, Horn antenna, Pyramidal Horn Antenna, Reflector Antennas. **Special Antennas:** Monopole and Dipole antennas, Long wire, V and Rhombic antennas, Yagi-Uda array, Turnstile antenna, Helical Antenna, Biconical antenna, Log-periodic dipole array, Spiral antenna, Microstrip Patch antenna.

UNIT-IV

Arrays: Linear, Planar, and Circular: Introduction, Two-Element Array, N-Element Linear Array: Uniform Amplitude and Spacing, N-Element Linear Array: Directivity, Design Procedure, N-Element Linear Array: Three-Dimensional Characteristics, Rectangular-to-Polar Graphical Solution, N-Element Linear Array: Uniform Spacing, Nonuniform Amplitude, Superdirectivity, Planar Array Design Considerations. **Antenna Synthesis and Continuous Sources**: Introduction, Continuous Sources, Schelkunoff Polynomial Method, Woodward-Lawson Method.

UNIT-V

Wave Propagation: Ground wave propagation: Free space propagation, ground reflection, surface waves, diffraction, wave propagation in complex environments, Tropospheric propagation, Tropospheric scatter. Ionospheric Propagation: Electrical properties of the ionosphere, effect of earth's magnetic field

Textbooks:

1. Antenna Analysis and Design 3/e Contantine A. Balanis Wiley Publications, 2009.
2. Antennas and Wave Propagation, 1/e, A.R. Harish & M. Sachidananda, Oxford University Press, 2007

Reference Books:

1. Antennas and Wave Propagation by A.Harish, Satchidananda, Oxford University Press
2. EM Waves and Radiation Systems, E. C. Jordan and K. G. Balmain, PHI–N. Delhi, 1997
3. Antennas J.D. Kraus, McGraw Hill Publications.
4. Antenna Theory and Practice, Rajeswari Chatterjee, Wiley Eastern Ltd. – N. Delhi
5. Electronic and Radio Engineering, F. E. Terman, McGraw Hill – New York.
6. Antennas and Wave Propagation, Annapurna K. Das, Sisir K. Das, Tata Mc Graw Hill, 2012.

B.Tech. (ECE) – V SEMESTER
EUREC506: LINEAR INTEGRATED CIRCUITS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

DC Performance of an Opamp: Introduction, Input Bias Currents, Input Offset Current, Effect of Bias Current on Output Voltage, Effect of Offset current on Output Voltage, Input Offset Voltage, Input offset Voltage for the adder circuit. Nulling-Out Effect of Offset Voltage and Bias Currents. AC Performance of an Opamp: Introduction, Frequency Response of an OpAmp, Amplifier Gain and Frequency Response, Slew Rate and Output Voltage, Noise in the Output Voltage, Loop Gain

UNIT II

Comparators and Controls: Effect of noise on comparator circuits, Positive feedback, Zero crossing detector with hysteresis, voltage level detectors with hysteresis, On-Off control principles, IC Precision comparator, Independently adjustable set point controller. Differential, Instrumentation and Bridge Amplifiers: Basic Differential Amplifier, Differential vs Single Ended Amplifiers, Improving the basic differential amplifier, Instrumentation Amplifier, Sensing and Measuring with the Instrumentation Amplifier, Instrumentation Amplifier as a signal conditioning circuit. Measurement of a small resistance change, Balancing a strain gauge bridge.

UNIT III

Modulation, Demodulation and Frequency Changing with the multiplier: Multiplying DC Voltages, Squaring a number of dc voltages, frequency doubling, phase angle detection, analog divider, finding square roots, amplitude modulation, demodulation, balanced modulator, single sideband modulator/demodulator, frequency shifting Power Supplies: Introduciton to unregulated power supply, dc voltage regulation, ac ripple voltage, design of a full wave bridge unregulated supply, Need for voltage regulation, history of linear voltage regulators, linear ic voltage regulators.

UNIT IV

Integrated Circuit Timers: Introduction, Operating Modes of the 555 Timer, Terminals of the 555 Timer, Free Running mode and applications, Monostable operation and applications timer/counter applications, switch programmable timer

UNIT V

Digital-to-Analog Converters: Introduction, DAC Characteristics, Digital-to-Analog conversion process, Voltage Output DACs, Multiplying DAC, 8-Bit Digital to Analog Converter DAC-08. Microprocessor Compatibility. Analog-to-Digital Converters: ADC Characteristics, Integrating ADC, Successive Approximation ADC, ADCs for Microprocessors. Flash Converters: Principle of Operation, Conversion Time.

Text Books:

1. Op-Amps and Linear Integrated Circuits by R.F Coughlin and F.F Driscoll by Pearson Education, 6th Edition

References:

1. Linear Integrated Circuits by S.Salivahanan,V.S.Kanchan Bhaskaran, TMH edition
2. Op-Amps and Linear ICs, Ramakanth Gayakward, Pearson Education
3. Linear Integrated Circuits, Roy Choudary and Vishal.K.Jain, New Age

B.Tech. (ECE) – V SEMESTER
EUREC511: COMMUNICATION SYSTEMS LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

1. AM generation and demodulation.
2. FM generation and FM demodulation (using 1496, 565 & 566 ICs)
3. Pre-emphasis and de-emphasis
4. Radio Receiver Measurements
5. Balanced Modulator
6. Frequency Multiplier
7. IF amplifier
8. SSB Generation and Detection
9. Transmission Lines parameters
10. Pulse Amplitude Modulation.
11. Sampling
12. Multiplexing & Demultiplexing
13. PWM & PPM.

B.Tech. (ECE) – V SEMESTER
EUREC512: MICROPROCESSOR LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

1. Block manipulation.
2. Arithmetic operations-Addition and subtraction of n numbers.
3. Multiplication.
4. Hexadecimal counters: 8-bit and 16-bit.
5. Decimal counters: up and down
6. Hexadecimal clock
7. Flashing displays
8. Keyboard management.
9. Interrupts
10. Interfacing D/A converter
11. Interfacing A/D converter
12. Traffic light interface
13. Logic controller interface
14. Elevator interface

B.Tech. (ECE) – V SEMESTER
EUREC513: ELECTRONIC CIRCUIT SIMULATION LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

1. V-I characteristics of a PN junction diode, Zener Diode & LED.
2. Zener diode Regulator.
3. Characteristics of CE Transistor and its h parameters.
4. Analysis of Emitter Follower
5. RC Phase - Shift Oscillator.
6. Wien - Bridge Oscillator.
7. RC Differentiator & RC Integrator.
8. Clipping Circuits.
9. Clamping Circuits.
10. Schmitt Trigger using 741 IC.
11. 555 Timer - Monostable and Astable modes

B.Tech. (ECE) – VI SEMESTER
EUREC601/EIREC601: RADAR ENGINEERING

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Introduction: Introduction to Radar, Radar Waveform, Radar Equation, Radar Block Diagram and Operation, applications, Radar frequencies, Radar Cross-section of targets, Prediction of Range, Minimum Detectable Signal, Receiver Noise, Probability density function, false alarm, Signal to Noise ratio, Integration of Radar Pulses, Transmitter Power, PRF, Range Ambiguities, Radar Antenna Parameters, System Lossless and Propagation Effects.

UNIT II

CW Radar and FM CW Radar: Doppler Effect, CW Radar, FM CW Radar, FM-CW Altimeter, Airborne Doppler Navigation, Multiple Frequency CW Radar. MTI and Pulse Doppler Radar: Introduction, principle, MTI radar with power amplifier and power oscillator transmitter, Delay line Cancellers, blind speeds, double cancellation, staggered PRFs, Range gated Doppler filter, Limitations to the MTI performance Moving target Detector, , MTI from a moving platform, MTI verses Pulse Doppler Radar.

UNIT III

Tracking Radar: Introduction, Sequential Lobing, Conical Scanning, Monopulse tracking Radar, Phase comparison Monopulse, Low range tracking, Comparison of trackers, tracking in range.

UNIT IV

Radar Receiver and Elementary Concepts of Compression: Radar receiver, Receiver Noise, Noise figure, Duplexers, Radar Displays, Receiver Protectors. Matched filter receiver. Phase Course Coded pulse compression, Synthetic Aperture Radar (SAR), Phased Array Radars, MST Radar, ECM, and ECCM.

UNIT V

Radar Navigational aids: Principles of Direction finders, Aircraft Homing, Instrument Landing System, Hyperbolic Navigation, LORAN, DECCA, OMEGA, Inland Shipping Aids .Introduction to the Radar Clutter, Surface clutter radar equation, sea clutter, detection of targets in clutter.

Text Book:

1. Introduction to Radar Systems, Skolnik, McGraw Hill', 2nd Edition

Reference Book:

1.Radar Engineering, Edde, Pearson Education

B.Tech. (ECE) – VI SEMESTER
EUREC602: DIGITAL SIGNAL PROCESSING

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Review of discrete time signals, systems and transforms: Discrete time signals-sequences, Linear shift Invariant systems, Stability and causuality, Linear constant coefficient Difference equations, Frequency Domain representation of Discrete Time Systems and signals, Some symmetry properties of the Fourier transform, Z-transform-Inverse Z-transform, Z-transform theorems and properties, System function.

UNIT II

The Discrete Fourier transform(DFT): Representation of Periodic sequences-The Discrete Fourier series, Fourier representation of Finite Duration sequences-The Discrete Fourier transform, computation of DFT, Properties of the 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

Implementation of Discrete time systems: Structures for FIR systems: Direct form structure, Cascade-Form Structures. Structures for IIR systems: Direct form structure, Cascade-Form Structures Parallel form Structures. Finite word length effects in digital filters: Fixed and floating point representation of numbers, Quantization of filter coefficients -Analysis of sensitivity to Quantization of filter coefficients ,Quantization of coefficients in FIR filters, Round off effects in digital filters-Limit cycle oscillations in recursive systems.

UNIT IV

Design of IIR filters: Design of IIR filters from analog filters, Butterworth filters, Chebyshev filters, IIR filter design by impulse Invariance, IIR filter design by the Bilinear Transformation.

UNIT V

Design of FIR filters&DSP processors: Linear phase characteristics, Design of Linear phase FIR Filters using Windows and frequency sampling method,Design of Optimum Equiripple Linear Phase FIR filters. DSP architecture for signal processing-Harvard architecture, pipelining, hardware multiplier- accumulator, Fixed point digital processors, Floating point digital signal processors.

Text Books:

1. A.V. Oppenheim and R. W. Shafer, Discrete-Time Signal Processing, Prentice Hall India, 2/e, 2004.
2. J. G. Proakis and D. G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, 4/e, Pearson Education, 2007.

Reference Books:

1. Sanjay K.Mitra- Digital signal processing- A computer based approach, TMH.
2. Ifeacher E.C & Jervis B.W, Digital signal processing –A practical approach, Pearson Edu.
3. Digital Signal Processing, P.Ramesh Babu, Scitech Publications

B.Tech. (ECE) – VI SEMESTER
EUREC603: VLSI SYSTEM DESIGN

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Review of microelectronics and introduction to MOS technology: Introduction to IC Technology, MOS and related VLSI technology, Enhancement mode MOS transistor, Depletion mode MOS transistor, nMOS fabrication, CMOS fabrication, Comparison of NMOS, CMOS, BICMOS, GaAs Technologies, thermal aspects of processing, production of E beam masks.

UNIT II

Basic Electrical Properties of MOS and BiCMOS Circuits: Drain-to-Source Current vs Voltage relationships, Aspects of MOS transistor threshold voltage, MOS transistor transconductance and output conductance, The Pass Transistor, The NMOS inverter, Determination of Pullup to Pulldown ratio of NMOS transistor driven by another nmos transistor. Alternate forms of Pullup.The CMOS inverter.MOS transistor circuit model. Latch up in CMOS circuits.

UNIT III

MOS and BICMOS circuit design process: MOS layers, stick diagrams, design rules and layout, 2μ.meter, 1. 2μ.meter CMOS rules. Layout diagrams, Symbolic diagrams.

UNIT IV

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 Scaling.

UNIT V

Sub system design and Layout: Architectural issues, switch logic, Gate logic, examples of structural design (Combinational logic), Some clocked sequential circuits. Memory Register and Aspects of System Timing: Some commonly used storage/memory elements. Subsystem Design Process: General Arrangement of 4-bit arithmetic processor, Regularity, Design of an ALU subsystem. CMOS Projects: Incrementer/Decrementer, Comparator for two n-bit numbers.

Text books:

1. Douglas A, Pucknell, Kamran Eshraghian, Basic VLSI design, Prentice-Hall, 1996 3rd edition.
2. Douglas A, Pucknell, Kamran Eshraghian, Essentials of VLSI Circuits and Systems, Prentice Hall Publications.

Reference books:

1. Mead, C.A and Conway, L.A, Introduction to VLSI systems, Wesley-Wesley
2. Kang, Leblibici, CMOS Digital Integrated Circuits, Tata McGraw Hill Publications, 2001
3. Jan M. Rabaey, Digital Integrated Circuits, Second Edition, Pearson Education, 2002.
4. Mead, C.A and Conway, L.A, Introduction to VLSI systems, Wesley-Wesley

B.Tech. (ECE) – VI SEMESTER
EUREC604: COMPUTER ARCHITECTURE & ORGANIZATION

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Register Transfer and Micro operations: Register transfer language - Register transfer - Bus and Memory transfers – Arithmetic micro operations - Logic micro operations – Shift micro operations – Arithmetic Logic Shift Unit Computer Arithmetic: Introduction- Addition and Subtraction- Floating point Arithmetic operations- Decimal Arithmetic Unit

UNIT II

Basic Computer Organization: Instruction Course Codes – computer registers – computer instructions – timing and control – instruction cycle – memory reference instructions – input-output and interrupt – complete computer description

UNIT III

CPU Organization: Introduction - general register organization – stack organization - instruction formats – addressing modes – data transfer and manipulation – program control – Reduced Instruction Set Computer(RISC) – Complex Instruction Set Computer(CISC)

UNIT IV

Micro programmed Control: Control memory – address sequencing – microinstruction format – vertical and horizontal microinstructions – micro program example – design of control unit

UNIT V

Memory Organization: Memory hierarchy – main memory – associative memory – cache memory – virtual memory, Input-Output organization: Peripheral devices – input/output interface – asynchronous data transfer – modes of transfer – direct memory access.

Text Book:

1. Mano, Morris M., Computer System Architecture, 3rd ed. Pearson Education Asia, 2000.

Reference Books:

1. Stallings W., Computer Organization and Architecture, 6th ed. Pearson Education Asia, 2000
2. Hamacher, V.C., Z.G.Vranesic, and S.G.Zaky, Computer Organization, 3rd ed, McGraw-Hill, 1990

B.Tech. (ECE) – VI SEMESTER
EUREC605/EIREC604/EUREI605: ENGINEERING ECONOMICS & MANAGEMENT

Category: HS Credits: 3 Hours: 4 per week Department: ECE

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 & Brothers , 13th ed
2. Industrial Engineering and Management by o.P Khanna, Khanna Publishers Ltd.

Reference Books:

1. Engineering and Managerial Economics – 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 Managament by L.M. Prasad, Sultan Chand & Sons.

B.Tech. (ECE) – VI SEMESTER
EUREC606: ELECTRONIC MEASUREMENTS & INSTRUMENTATION

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Introduction- Measurement and error definitions, Accuracy and precision significant figures, Types of errors. Standard Analysis:- Probability errors, limiting errors. Standards of measurement, classification of standards, emf, resistance, current, induction, capacitance standards. Bridges

UNIT II

Electronic Instrumentation for Measuring basic Parameters: Introduction – PMMC Principle – PMMC ammeters, voltmeters – extension of ranges, AC voltmeters using rectifiers – True RMS responding voltmeter – Electronic Multimeter – Digital Voltmeters – Component Measuring Instruments – Q-meter – Vector Impedance Meter – Vector Voltmeter RF Power and Voltage Measurement.

UNIT III

Oscilloscopes – Block diagram – Cathode ray tube – electrostatic focusing-deflection system-Oscilloscope probes and transducers – Oscilloscope Techniques – observation of the wave forms – Lissajous patters. Special Oscilloscope – analog storage oscilloscope – Digital storage oscilloscope – Sampling oscilloscope.

UNIT IV

Signal Analysis :Wave analyzer – Heterodyne analyzer – Harmonic distortion analyzer spectrum analyzer.

UNIT V

Data acquisition system – types, components of analog and digital data acquisition system – multiplexing –use of analog and digital recorders-use of filters and sample hold circuits – Bus interface standards – IEEE-488 GPIB organization.

Text Books :

1. Electrical and Electronic Measurements and Instrumentation by A.K. Sawhney,2002 edition
2. Electronic Measurements and Instrumentation by B.H. Oliver and Cage, McGraw Hill.

Reference Books:

1. Electronic Measurements by Terman and Pettit, McGraw Hill Publications.
2. Electronic Measurements, H.S. Kalsi, TMH

B.Tech. (ECE) – VI SEMESTER

EUREC611: DIGITAL SIGNAL PROCESSING LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

Part – I : DSP Using Matlab

Representation of Discrete Time Sequences and Systems, Correlation and Convolution (Linear Convolution and Circular Convolution), Filter Analysis and Implementation, FIR Filter Design, IIR Filter Design

Part – II Programming DSP Processors

Review of DSP Processor Basics, Sampling, Aliasing Effects, Addition, Subtraction and Multiplication of Two numbers, Waveform generation (Square Wave, Triangular Wave, Sine Wave Generators), FIR Filter Implementation, IIR Filter Implementation, Quantization Noise Effects

Text Books:

1. Digital Signal Processing with MATLAB 3/e, Proakis, Salehi, Cengage Publications
2. Digital Signal Processing – A Computer Based Approach By Sanjay K. Mitra, Tata McGraw Hill Publications.
3. Ifeacher E.C & Jervis B.W, digital signal processing –A practical approach, Pearson Edu.

B.Tech. (ECE) – VI SEMESTER
EUREC612: LINEAR INTEGRATED CIRCUITS LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

1. Study of Inverting & Non inverting Op Amp Characteristics.
2. Measurement of Op Amp Parameters
3. Applications of Op Amps
4. Binary using 741 IC.
5. Schmitt Trigger using 741 IC.
6. 555 Timer - Monostable and Astable mode
7. Three Terminal IC Voltage Regulator
8. A/D Converters
9. D/A Converters
10. Active filters.
11. PLL and its applications
12. VCO Characteristics
13. Simulation of any FOUR experiments of the above using PSPICE

B.Tech. (ECE) – VI SEMESTER
EUREC613: PERSONALITY DEVELOPMENT

Category: HS Credits: Noncredit CourseHours: Department:

B.Tech. (ECE) – VII SEMESTER
EUREC701: SATELLITE COMMUNICATIONS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Over View of Satellite Systems: Introduction, frequency allocations for Satellite services, Intelsat,InSAT,Polar Orbiting satellites, Indian scenario, Applications

UNIT II

Orbits and Launching methods: Keplers Laws of planetary motion,Orbital elements,Orbit perturbations,Inclined orbits,Geostationary orbits, sub satellite point, predicting satellite position, Standard Time,Antenna Look angles,

UNIT III

The space segment : Introduction ,Power supply and attitude control, Station keeping, TT&C, transponders,The antenna sub system, Link design: Up link , down Link and satellite link design

UNIT IV

Modulation , multiplexing and multiple access :Introduction, analog and digital transmission systems, analog and digital modulations, Multiplexing techniques, FDMA,TDMA,CDMA,PN Sequence, spread spectrum, Demand assignment multiple access, SPADE

UNIT V

The earth segment:Introduction, Polarization of satellite signal and antenna. Atmospheric effects, Ionospheric effects, Rain attenuation and other propagation impairments, Transmit-receive earth stations,Satellite networks:Bandwidth, ATM over satellite , Internet through satellites and satellite mobile services.

Text Books:

1. Satellite Communications : Dennis Roddy ,Tata McGrawHill, fourth edition.
2. Satellite Communication, T. Pratt and S. W. Bostian, John Wiley and Sons.

Reference Books:

1. Satellite Communication, D. C. Agarwal, Khanna Publishers.
2. Satellite Communication, Dharma Raj Cheruku, IK International Publishing, House, New Delhi, 2009.

B.Tech. (ECE) – VII SEMESTER
EUREC702: ENVIRONMENTAL STUDIES

Category: HS Credits: 4 Hours: 5 per week Department: Engg. Chemistry

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 Population and the Environment: 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. Unit – VI: 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 Books:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha. Published by – University Grants Commission, Universities Press, India.
2. Text book of environmental studies for under graduate courses by Benny Joesph publishers by Tata Mc Graw Hill publishers company Ltd.
3. Text book of environmental studies by Kaushik & Kaushik

Reference Books:

1. Agarwal, K.C. 2001. Environmental Biology
2. Brunner R.C. 1989; Harazdous waste incineration , Mc Graw Hill Inc.

B.Tech. (ECE) – VII SEMESTER

EUREC703: ADVANCED COMMUNICATION SYSTEMS

Category: CE Credits: 3 Hours: 4 per week Department: ECE

UNIT I

Optical Fiber Transmission Media:

Introduction, History of optical fiber communications, Optical Fibers vs metallic cable facilities, electromagnetic spectrum, block diagram of an optical fiber communication system, optical fiber types, light propagation, optical fiber configurations, optical fiber classifications, losses in optical fiber cables, light sources, optical sources, light detectors, lasers, optical fiber system link budget

UNIT II

Microwave Radio Communications and System Gain

Introduction, Advantages and Disadvantages of Microwave radio, Analog vs digital microwave, frequency vs amplitude modulation, frequency modulated microwave radio system, fm microwave radio repeaters, diversity, protection switching arrangements, fm microwave radio stations, microwave repeater station, light of sight path characteristics, microwave radio system gain

UNIT III

Digital Telephone Transmission:

Pulse Modulation, PCM, PCM Sampling, Signal to Quantization Noise ratio, linear vs nonlinear pcm codes, idle channel noise, coding methods, companding, vocoders, pcm line speed, delta modulation pcm, adaptive delta modulation pcm, differential pcm, pulse transmission, signal power in binary digital signals. Time division multiplexing, T1 digital carrier, North American Digital hierarchy, Digital Carrier line coding, T-Carrier systems, European Digital Carrier System, Digital Carrier frame synchronization, Bit vs Word interleaving, statistical time division multiplexing, codecs and combo chips, frequency division multiplexing, AT&Ts FDM hierarchy, composite baseband signal, formation of a mastergroup, wavelength division multiplexing. Public Telephone Network: Telephone transmission system environment, public telephone network, instruments, local loops, trunk circuits and exchanges.

UNIT IV

Cellular Telephone Concepts

Mobile Telephone Service, evolution of cellular telephone, cellular telephone, frequency reuse, interference, cell splitting, sectoring, segmentation and dualization, celluar system topology, roaming and handoffs, cellular telephone network components, cellular telephone call processing

UNIT V

Cellular Telephone Systems

Introduction, First generation analog cellular telephone, personal communications, system, second generation cellular telephone systems, Digital Cellular telephone, interim standard 95 (IS-95), North americal cellular and pcs summary, global system for mobile communications, personal satellite communication systems.

Text book:

1. Advanced electronic communication systems-Wayne Tomasi, Prentice Hall

Reference Books:

1. Electronic Communication systems.George Kennedy.TMH
2. Digital telephony.John BELLAMY,Wiley PUBLICATIONS.

DEPARTMENTAL ELECTIVE –I

Course Code	Name of the Course	Category	Credits
EUREC721	Television Engineering	DE	4
EUREC722	Microcontrollers & Applications	DE	4
EUREC723	Speech Processing	DE	4
EUREC724	Digital Control systems	DE	4
EUREC725	Digital Design Through Verilog	DE	4

DEPARTMENTAL ELECTIVE -II

Course Code	Name of the Course	Category	Credits
EUREC731	Digital Image Processing	DE	4
EUREC732	Fiber Optic Communications	DE	4
EUREC733/ EIRDS702	Advanced Digital Signal Processing	DE	4
EUREC734	Tele Communication Switching Systems and networks	DE	4
EUREC735	Operating Systems	DE	4

B.Tech. (ECE) – VII SEMESTER
EUREC721: TELEVISION ENGINEERING

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Video System Fundamentals. Color Video Fundamentals. Introduction to Digital Technology.

UNIT II

Elements of Image Quality, Audio Technology for Video, Analog Video Systems.

UNIT III

Digital Video Systems—DTV, Digital Video Systems—Computers, Video Cameras.

UNIT IV

Professional Video Recorders, Home and Semiprofessional Video Recorders, Video Postproduction Systems

UNIT V

Television Receivers and Video Monitors, Digital Video Display Systems

Text Books:

1. "Video Engineering" by Inglis and Luther, McGraw-Hill, Inc., 3rd Edition, 1999, ISBN 0-07-135017-9.
2. "Television Engineering Handbook," K. Blair Benson revised by Jerry Whitaker, McGraw-Hill, Inc., 1992, ISBN 0-07-004788-X

B.Tech. (ECE) – VII SEMESTER
EUREC722: MICROCONTROLLERS AND APPLICATIONS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Overview of Architecture and Microcontroller Resources: Architecture of a microcontroller – Microcontroller resources – Resources in advanced and next generation microcontrollers – 8051 microcontroller – Internal and External memories – Counters and Timers – Synchronous serial-cum asynchronous serial communication - Interrupts.

UNIT II

8051 Family Microcontrollers Instruction Set: Basic assembly language programming – Data transfer instructions – Data and Bit-manipulation instructions – Arithmetic instructions – Instructions for Logical operations on the tes among the Registers, Internal RAM, and SFRs – Program flow control instructions – Interrupt control flow.

UNIT III

Real Time Control: Interrupts Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-maskable interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051.Real Time Control: Timers : Programmable Timers in the MCU's – Free running counter and real time control – Interrupt interval and density constraints. Real Time OS for Microcontrollers Real Time operating system – RTOS of Keil (RTX51) – Use of RTOS in Design – Software development tools for Microcontrollers.

UNIT IV

Systems Design: Digital and Analog Interfacing Methods: Switch, Keypad and Keyboard interfacings – LED and Array of LEDs – Keyboard-cum-Display controller (8279) – Alphanumeric Devices – Display Systems and its interfaces – Printer interfaces – Programmable instruments interface using IEEE 488 Bus – Interfacing with the Flash Memory – Interfaces – Interfacing to High Power Devices – Analog input interfacing – Analog output interfacing –Prototype MCU based Measuring instruments – Robotics and Embedded control – Digital Signal Processing and Digital Filters.

UNIT V:

16/32 - Bit Microcontrollers : Hardware – Memory map in Intel 80196 family MCU system – IO ports – Progammable Timers and High-speed outputs and input captures – Interrupts – instructions. ARM 32 Bit MCUs : Introduction to 16/32 Bit processors – ARM architecture and organization – ARM / Thumb programming model – ARM / Thumb instruction set – Development tools.

Text Books:

1. Microcontrollers Architecture, Programming, Interfacing and System Design – Raj Kamal, Pearson Education, 2005.
2. The 8051 Microcontroller and Embedded Systems – Mazidi and Mazidi, PHI, 2000.

Reference Books:

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

B.Tech. (ECE) – VII SEMESTER
EUREC723: SPEECH PROCESSING

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Introduction to Speech Processing: The Speech Signal, Digital Speech Processing, Digital Transmission and Storage of Speech, Speech Synthesis Systems, Speech Verification and Identification, Speech Recognition Systems. Digital models for the speech signal - mechanism of speech production - acoustic theory - lossless tube models - digital models – Categorization of speech sounds – The melody of speech – speech perception.

UNIT II

Time Domain Models for Speech Processing: Introduction, Time Dependent Processing of Speech, Short time energy and average magnitude, Short Time average zero crossing rate, Speech vs Silence Discrimination using energy and zero crossings, Pitch Period Estimation. Digital Representations of the Speech Waveform: Instantaneous Quantization, Adaptive Quantization, Delta Modulation, Differential PCM, Comparison of Systems.

UNIT III

Linear predictive coding of speech - auto correlation - formulation of LPC equation - solution of LPC equations - levinson Durbin algorithm - levinson recursion - schur algorithm - lattice formulations and solutions - PARCOR coefficients, Spectral analysis of speech - short time Fourier analysis - filter bank design - speech coding - sub band coding of speech - transform coding - channel voCourse Coder - formant voCourse Coder - cepstral voCourse Coder - vector quantizer Course Coder

UNIT IV

Speech synthesis - pitch extraction algorithms - gold rabiner pitch trackers - autocorrelation pitch trackers - voice/unvoiced detection - homomorphic speech processing - homomorphic systems for convolution - complex cepstrums - pitch extraction using homomorphic speech processing

UNIT V

Automatic speech recognition systems - isolated word recognition - connected word recognition - large vocabulary word recognition systems - pattern classification - DTW, HMM - speaker recognition systems - speaker verification systems - speaker identification systems

Text Books:

1. Rabiner L.R. & Schafer R.W., "Digital Processing of Speech Signals", PHI
2. Thomas Parsons, "Voice and Speech Processing", McGraw Hill Series.

Reference Books:

1. Owens F.J., "Signal Processing of Speech", Macmillan New Electronics.
2. Rabiner L.R. & Gold, "Theory and Applications of Digital Signal Processing", Prentice Hall of India.

B.Tech. (ECE) – VII SEMESTER
EUREC724: DIGITAL CONTROL SYSTEMS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Sampling process, hold circuits; Application and limitations of z -transform, delayed and modified z-transform. Review of transfer function, block diagrams and signal flow graphs;Multi-rate discrete data systems.

UNIT II

State variable representation of digital systems, state diagram, analysis of response between sampling points; Stability study of SISO and MIMO systems, effect of sampling rate variations on stability.

UNIT III

Time domain, z-domain and frequency domain analysis, w-plane,frequency warping and pre-warping, root locus of discrete systems, MATLAB simulation of typical cases.

UNIT IV

Bode diagram of discrete systems ,Digital simulation, modeling with S/H circuits, numerical integration in simulation.

UNIT V

Design of digital control systems, bilinear transformation, PID controller, cascade
compensation, pole-zero cancellation designs, pole placement and dead-beat designs, design exercises in both frequency and time domain; Microprocessor and microcontroller implementation of digital control algorithms.

Text Books:

1. Gopal, M., “Digital Control and State Variable Methods”, 2nd Ed., Tata McGraw-Hill.2003
2. Franklin, G.F. and Powell, J.D., “Digital Control of Dynamic Systems”, 3rd Ed., Pearson Education.2000
3. Philips, C.L. and Nagle Jr., H.T., “Digital Control System Analysis and Design”, 3rd Ed., Prentice-Hall.2005
4. Kuo, B.C., “Digital Control Systems”, 2nd Ed., Oxford University Press. 2004

B.Tech. (ECE) – VII SEMESTER
EUREC725: DIGITAL DESIGN THROUGH VERILOG

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Introduction to Verilog: Verilog as HDL, 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. (ECE) – VII SEMESTER
EUREC731: DIGITAL IMAGE PROCESSING

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Fundamentals of Image Processing: Image Acquisition, Image Model, Sampling, Quantization, Relationship between pixels, distance measures, connectivity, Image Geometry, Photographic film. Histogram: Definition, decision of contrast basing on histogram, operations basing on histograms like image stretching, image sliding, Image classification. Definition and Algorithm of Histogram equalization. Image Transforms 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform

UNIT II

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.

UNIT III

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: Lossless compression: Variable length coding – LZW coding – Bit plane coding- predictive coding-DPCM.,Lossy Compression: Transform coding — Basics of Image compression standards: JPEG, MPEG, Basics of Vector quantization.

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.

Applications: Automatic visual system in part inspection, forensic and security system, entertainment- multimedia, scientific and medical investigation.

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.

B.Tech. (ECE) – VII SEMESTER
EUREC732: FIBER OPTIC COMMUNICATIONS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Overview of Optical Fiber Communication - Historical development, The general system, advantages of optical fiber communications. Optical fiber wave guides- Introduction, Ray theory transmission, Total Internal Reflection, Acceptance angle, Numerical Aperture, Skew rays. Cylindrical fibers- Modes, V-number, Mode coupling, Step Index fibers, Graded Index fibers.

UNIT II

Single Mode Fibers- Cut off wavelength, Mode Field Diameter, Effective Refractive Index. . Signal distortion in optical fibers- Attenuation, Absorption, Scattering and Bending losses, Core and Cladding losses. Information capacity determination, Group delay, Types of Dispersion - Material dispersion, Wave-guide dispersion, Polarization mode dispersion, Intermodal dispersion. Pulse broadening.

UNIT III

Fiber Splicing- Splicing techniques, splicing single mode fibers .Fiber alignment and joint loss- Multimode fiber joints, single mode fiber joints. Optical fiber Connectors- Connector types, Single mode fiber connectors, Connector return loss. . Fiber materials — Glass, Halide, Active glass, Chalgenide glass, Plastic optical fibers.Source to fiber power launching - Output patterns, Power coupling, Power launching, Equilibrium Numerical Aperture, Laser diode to fiber coupling.

UNIT IV

Optical Sources- LEDs, Structures, Materials, Quantum efficiency, Power, Modulation, Power bandwidth product. Injection Laser Diodes- Modes, Threshold conditions, External quantum efficiency, Laser diode rate equations, Resonant frequencies. Reliability of LED&ILD. Optical Detectors- Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparison of Photodetectors. Optical receiver operation-Fundamental receiver operation, Digital signal transmission, error sources, Receiver configuration, Digital receiver performance, Probability of error, Quantum limit, Analog receivers.

UNIT V

Optical System Design — Considerations, Component choice, Multiplexing. Point-to- point links, System considerations, Link power budget with examples. Overall fiber dispersion in Multi mode and Single mode fibers, Rise time budget with examples. Transmission distance, Line coding in Optical links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye pattern.

Text Books:

1. Optical Fiber Communications – Gerd Keiser, McGrawHill International Ed., 3rd Edition, 2000.
2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002.

Reference Books:

1. Fiber Optic Communications – D.K. Mynbaev, Gupta and Scheiner, Pearson Ed. 2005
2. Text Book on Optical Fibre Communication and its Applications – S.C.Gupta, PHI, 2005.
3. Fiber Optic Communication Systems – Govind P. Agarwal, John Wiley, 3rd Edition, 2004.
4. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.

B.Tech. (ECE) – VIII SEMESTER

EUREC733/EIRDS702: ADVANCED DIGITAL SIGNAL PROCESSING

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Multirate Digital Signal Processing – Introduction, Decimation by a Factor D, Interpolation by a Factor I, Sampling Rate Conversion by a Rational Factor I/D, Implementation of Sampling Rate Conversion, Multistage Implementation of Sampling Rate Conversion, Applications of Sampling Rate Conversion, Digital Filter Banks Two-Channel Quadrature Mirror Filter Bank.

UNIT II

Linear Prediction And Optimum Linear Filters - Random Signals, Correlation Functions and Power Spectra, Innovations Representation of a Stationary Random Process, Forward and Backward Linear Prediction, Solution of the Normal Equations Wiener Filters for Filtering and Prediction.

UNIT III

Adaptive Filters - Applications of Adaptive Filters, Adaptive Direct-Form FIR Filters-The LMS Algorithm, Adaptive Direct-Form FIR Filters-RLS Algorithms.

UNIT IV

Power Spectrum Estimation – Basic Methods Estimation of Spectra from Finite-Duration Observations of Signals, Nonparametric Methods for Power Spectrum Estimation, Parametric Methods for Power Spectrum Estimation.

UNIT V

Power Spectrum Estimation – Advanced Methods: Filter Bank Methods: Capon's method, Eigenanalysis Algorithms for Spectrum Estimation: Pisarenko Harmonic Decomposition Method, MUSIC algorithm, ESPIRIT algorithm, Eigen Decomposition method

Text Book

1. Digital Signal Processing : Principles, Algorithms and Applications - Proakis, J.Gard and D.G.Manolakis, Fourth Edition, PHI, 2006.

Reference Books

1. Monson Hayes, Statistical Digital Signal Processing, Wiley Student Edition, 2008
2. Manolakis, Vijay Ingle, Statistical and Adaptive Signal Processing by Artech Book House, 2009.
3. P.P. Vaidyanathan, Multirate systems and Filter banks, Prentice Hall, 1993

4. V. Oppenheim and R.W.Schafer, Discrete time Signal Processing, PHI 1994
5. S.J. Orfanidis, Optimum Signal Processing, McGraw Hill, 1989.
6. Wavelet Transforms: Introduction to Theory and Applications, Raghuveer M Rao, Ajit S, Bopardikar, Pearson Education 2000.
7. Insight into Wavelets, Ramachandran and Soman, Prentice Hall Publications, 2003

B.Tech. (ECE) – VII SEMESTER

EUREC734: TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Telecommunication Switching Systems: Introduction, Elements of switching network configuration, strowger switching components, principles of cross bar switching, Electronic space division switching, Time division switching, Combination switching

UNIT II

Telephone Networks: Subscriber loop systems, switching hierarchy and routing, transmission plan, numbering plan, charging plans

UNIT III

Signaling Techniques: In channel signaling, common channel signaling. Network traffic parameters, grade of service and blocking probability

UNIT IV

Data Communication Networks: Introduction, network architecture, layered network protocols, data communications hardware, data communication circuits Public switched data networks, connection oriented & connection less service, Circuit Switching, switching and virtual circuit switching concepts, OSI reference model, LAN, WAN, MAN Repeaters, Bridges, Routers and gate ways.

UNIT V

Integrated Services Digital Networks: Introduction, motivation, ISDN interfaces, functional grouping, reference points, protocol architecture, signaling, numbering, BISDN, DSL Technology: ADSL, Cable Modem, Traditional Cable Networks, HFC Networks, CMTS and DOCSIS. SONET: Devices, Frame, Frame Transmission,

Text Books:

1. Telecommunication switching system and networks-Thyagarajan Viswanath, PHI
2. Advanced electronic communications systems - Wayne Tomasi, PHI, 2004

Reference Books:

1. Digital telephony - J. Bellamy, John Wiley, 2nd edition, 2001.
2. Data Communications & Networks - Achyut. S.Godbole, TMH, 2004.
3. Principles of Communication Systems – H. Taub & Schilling, TMH, 2nd Ed.
4. Data Communication & Networking- B.A.Forouzan, TMH, 3rd Edition, 2004.
5. Data Communications, Prakash. C. Gupta, PHI, 2001.
6. Telecommunication switching, Traffic and Networks - J E Flood, Pearson Education

B.Tech. (ECE) – VII SEMESTER

EUREC735: OPERATING SYSTEMS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Computer System and Operating System Overview: Overview of Computer System hardware, Instruction execution , I/O function , Interrupts ,Memory hierarchy , I.O Communication techniques. Operating System Objectives and functions , Evolution of operating System , Introduction to the issues in communication with devices, kernel and shell of an operating system. Example Systems.

UNIT II

Process Description , Process Control ,Process States, Process and Threads , Examples of Process description and Control. Concurrency :Principles of Concurrency , Mutual Exclusion , semaphores , Monitors , Message Passing. Principles of deadlock , deadlock prevention, detection and avoidance dining philosophers problem , example Systems.

UNIT III

Memory Management : Memory Management requirements , linking and loading, processes and primary memory management , memory allocation policies ,virtual memory , hardware and Control structures , OS Software , Examples of Memory Management.

UNIT IV

Uniprocessor Scheduling : Types of Scheduling , Scheduling algorithms , I/O management and Disc Scheduling , I/O devices , organization , of I/O function , OS design issues , I/O buffering , Disk I/O , disk scheduling Policies , examples System.

UNIT V

File Management and Security :Overview of file management , file organization and access , File Directories , File sharing , record blocking , secondary Storage Management , example system.

Security :Security threats , Protection , intruders , Viruses , trusted System. Case studies of Linux, Unix, Windows XP, VxWorks operating systems

Text Books :

1. Operating Systems' , Internal and Design Principles, Stallings, Fifth Edition,2005, Pearson Education/PHI.
2. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.

Reference Books:

1. Operating System A Design Approach,Crowley,TMH.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI

B.Tech. (ECE) – VII SEMESTER

EUREC711:VHDL/VERILOG SIMULATION LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

Modeling and Functional Simulation of the following digital circuits (with Xilinx/ ModelSim tools) using VHDL/Verilog Hardware Description Languages

Part – I Combinational Logic:

Basic Gates, Multiplexer, Comparator, Adder/ Substractor, Multipliers, DeCourse Coders, Address deCoders, parity generator, ALU

Part – II Sequential Logic:

D-Latch, D-Flip Flop, JK-Flip Flop, Registers, Ripple Counters, Synchronous Counters, Shift Registers (serial-to-parallel, parallel-to-serial), Cyclic EnCourse Coder / DeCourse Coder.

Part – III Memories and State Machines

Read Only Memory (ROM), Random Access Memory (RAM), Mealy State Machine, Moore State Machine, Arithmetic Multipliers using FSMs

Demonstration of FPGA and CPLD Boards, Demonstration of Digital design using FPGAs and CPLDs

Text Books:

1. VHDL Primer J. Bhasker, Pearson Education, India
2. Digital Systems Design Using VHDL by Charles H. Roth, Thomson Brookle

B.Tech. (ECE) – VII SEMESTER

EUREC712: ADVANCED COMMUNICATIONS LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

PART-A

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Directional Coupler Characteristics.
4. VSWR measurements.
5. Radiation Pattern measurements of Horn antenna.
6. Impedance, wavelength and frequency measurements.
7. Determination of Polarization of antennas.
8. Radiation Pattern measurement of Yagi antennas.
9. Measurement of Scattering Parameters.
10. Verification of Reciprocity Characteristics of antennas.
11. Measurement of attenuation Constant.
12. Coupling Measurement of H & E – Plane and magic-Tee Junctions
13. Measurement of dielectric constant.
14. Measurement of phase shift.
15. Circulators / Isolators

PART-B

1. Generation of PSK Signals and detection
2. Generation of FSK Signals and detection
3. PCM Transmission
4. Differential PCM
5. Delta Modulation and Detection
6. Continuously variable slope Delta Modulation
7. Study of Pseudo Random Binary Sequences (PRBS)
8. Study of Error Check Course Course CodeLogic
9. Study of Electromagnetic / Radio Frequency Interference using Optic Link

B.Tech. (ECE) – VII SEMESTER
EUREC713: PROJECT

Category: PW Credits: 3 Hours: 6 per week Department: ECE

- A summary of the progress of the work carried out is to be submitted at the end of the IV year I semester
- The work has to be original one
- Progress of the work is to be assessed at the end of the semester

B.Tech. (ECE) – VII SEMESTER
EUREC714: INDUSTRIAL TRAINING

Category: IT Credits: 2

Remarks:

1. The student will undergo training in any one of the approved list of Industry by the Head of the Department.
2. The duration of training should be four to six weeks in summer vacation between their third and final years of study.
3. 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.
4. The student will have to give a seminar on the training program during the semester.

B.Tech. (ECE) – VIII SEMESTER

DEPARTMENTAL ELECTIVE -III

Course Code	Name of the Course	Category	Credits
EUREC821/ EIREC 801	Embedded Systems	DE	4
EUREC822	Advanced Computer Architecture	DE	4
EUREC823	Dsp Systems And Architecture	DE	4
EUREC824	Wireless Communications and Networks	DE	4

DEPARTMENTAL ELECTIVE -IV

Course Code	Name of the Course	Category	Credits
EUREC831	Global Positioning Systems	DE	4
EUREC832/ EIRRM821	Microwave Networks	DE	4
EUREC833	Information Theory & Coding	DE	4
EUREC834	Electromagnetic Interference And Compatibility	DE	4
EUREC835 EIRVD833/DIRV DS801/EIRRM834	DSP Processors & Architecture	DE	4

DEPARTMENTAL ELECTIVE -V

Course Code	Name of the Course	Category	Credits
EUREC841	Mobile Communications& Networks	DE	4
EUREC842	Adaptive Signal Processing Techniques	DE	4
EUREC843	Mobile Computing	DE	4
EUREC844	Computer Networks	DE	4

B.Tech. (ECE) – VIII SEMESTER
EUREC821/EIREC 801: EMBEDDED SYSTEMS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

A First look at Embedded Systems: Examples of Embedded Systems, Typical Hardware. Hardware Fundamentals for the Software Engineer: Terminology, gates, a few other basic consideration, timing diagrams, memory. Advanced Hardware Fundamentals: Microprocessors, Buses, Direct Memory Access, Interrupts, Other common parts, built-Ins on the microprocessor, conventions used on schematics, A sample schematics, A last word about Hardware.

UNIT II

Interrupts: Microprocessor Architecture, Interrupt Basics, The Shared-Data Problem, Interrupt Latency. Survey of Software Architectures: Round-Robin, Round-Robin with Interrupts, Function-Queue-Scheduling Architecture, Real-Time Operating System Architecture, Selecting an Architecture.

UNIT III

Introduction to Real-Time Operating Systems: Tasks and Tasks States, Tasks & data, Semaphores and Shared Data. More Operating System Service: Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT IV

Basic Design Using a Real-Time Operating System: Overview, Principles, An Example, Encapsulating Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory Space, Saving Power.

UNIT V

Embedded Software Development Tools: Host and Targets Machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System. Debugging Techniques: Testing on your host machine, Instruction set simulators, the assert macro.

Text Book:

1. David E. Simon, “An Embedded Software Primer”, Pearson Education India

Reference Books:

1. David E. Simon, “An Embedded Software Primer”, Pearson Education India
2. Wayne Wolf, “Computers as Components: Principles of Embedded Computing System Design”, Morgan Kaufman Publishers.
3. Jane.W.S. Liu, “Real-Time systems”, Pearson Education Asia.
4. C. M. Krishna and K. G. Shin, “Real-Time Systems” , McGraw-Hill, 1997.
5. Frank Vahid and Tony Givargis, “Embedded System Design: A Unified Hardware/Software Introduction” , John Wiley & Sons.

B.Tech. (ECE) – VIII SEMESTER
EUREC822: ADVANCED COMPUTER ARCHITECTURE

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design. Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler

UNIT II

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP - ILP software approach- compiler techniques- static branch protection- VLIW approach- H.W support for more ILP at compile time- H.W verses S.W solutions

UNIT III

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

UNIT IV

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

UNIT V

Storage systems- Types – Buses - RAID- errors and failures- bench marking a storage device- designing a I/O system. Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster

Text Book:

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

Reference Books:

1. “Computer Architecture and parallel Processing” Kai Hwang and A.Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.

B.Tech. (ECE) – VIII SEMESTER
EUREC823: DSP SYSTEMS AND ARCHITECTURE

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

VLSI Architectures for DSP algorithms – Data flow representations, pipelining and parallel processing, retiming,

UNIT II

Unfolding, register minimization techniques, systolic architectures, algorithms for fast implementation of convolution,

UNIT III

FIR, IIR and adaptive filters, DCT, analysis of finite word length effects,

UNIT IV

Low power design strategies; Architecture, programming and applications of general purpose digital signal processors (Emphasis on TI & AD processors);

UNIT V

Application case studies: Speech coding, image and video compression, Viterbi decoding, wireless communication.

Text Books:

1. K.K. Parhi, VLSI Digital signal processing systems: Design and implementation, John Wiley, 1999.
2. Lars Wanhammar, DSP Integrated Circuits, Academic Press, 1999 S.M. Kuo, B.H.Lee, Real-Time Digital Signal Processing: Implementations, Applications, and Experiments with the TMS320C55X, Wiley, 2006.

B.Tech. (ECE) – VIII SEMESTER
EUREC824: WIRELESS COMMUNICATIONS AND NETWORKS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Multiple Access Techniques for Wireless Communication: Introduction, FDMA, TDMA, Spread Spectrum, Multiple access, SDMA, Packet radio, Packet radio protocols, CSMA protocols, Reservation protocols

UNIT II

Introduction to Wireless Networking: Introduction, Difference between wireless and fixed telephone networks, Development of wireless networks, Traffic routing in wireless networks.

UNIT III

Wireless Data Services: Common channel signaling, ISDN, BISDN and ATM, SS7, SS7 user part, signaling traffic in SS7. Mobile IP and Wireless Access Protocol: Mobile IP Operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless transaction, Wireless datagram protocol.

UNIT IV

Wireless LAN Technology: Infrared LANs, Spread spectrum LANs, Narrow bank microwave LANs, IEEE 802 protocol Architecture, IEEE802 architecture and services, 802.11 medium access control, 802.11 physical layer. BlueTooth: Overview, Radio specification, Base band specification, Links manager specification, Logical link control and adaptation protocol. Introduction to WLL Technology.

UNIT V

Mobile Data Networks: Introduction, Data oriented CDPD Network, GPRS and higher data rates, Short messaging service in GSM, Mobile application protocol. Wireless ATM & HiPER LAN: Introduction, Wireless ATM, HIPERLAN, Adhoc Networking and WPAN.

Text Books:

1. Wireless Communication and Networking – William Stallings, PHI, 2003.
2. Wireless Communications, Principles, Practice – Theodore, S. Rappaport, PHI, 2nd Edn., 2002.

Reference Books:

1. Telecommunication switching systems and networks – Thiagarajan Viswanathan, PHI
2. Mobile communications – Jochen Schiller, Pearson Education.
3. Wireless Digital Communications – Kamilo Feher, PHI, 1999.
4. Principles of Wireless Networks – Kaveh Pah Laven and P. Krishna Murthy, Pearson Education, 2002.

B.Tech. (ECE) – VIII SEMESTER

EUREC831: GLOBAL POSITIONING SYSTEM

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Overview of GPS : Basic concept, system architecture, space segment, user segment, GPS aided Geo-augmented navigation (GAGAN) architecture.

UNIT II

GPS Signals : Signal structure, anti spoofing (AS), selective availability, Difference between GPS and GALILEO satellite construction.

UNIT III

GPS coordinate frames, Time references : Geodetic and Geo centric coordinate systems, ECEF coordinate world geodetic 1984 (WGS 84), GPS time.

UNIT IV

GPS orbits and satellite position determination : GPS orbital parameters, description of receiver independent exchange format (RINEX) – Observation data and navigation message data parameters, GPS position determination.

UNIT V

GPS Errors: GPS error sources – clock error, ionospheric error, tropospheric error, multipath, ionospheric error estimation using dual frequency GPS receiver.

Text books :

1. B. Hoffman – Wellenhof, H. Liehtenegger and J. Collins, 'GPS – Theory and Practice', Springer – Wien, New York (2001).
2. James Ba – Yen Tsui, 'Fundamentals of GPS receivers – A software approach', John Wiley & Sons (2001).

B.Tech. (ECE) – VIII SEMESTER

EUREC832/EIRRM821: MICROWAVE NETWORKS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Microwave Circuits: One port junction, Terminal voltages and currents in multi port junctions, Poynting's energy theorem, Normalized waves and scattering matrix, Properties of [S] matrix, Wave amplitude transmission matrix [A], Impedance matching techniques: Quarter-wave and Tapered line Impedance transformers, Two Port Networks analysis with Transmission matrices, S-Parameter and signal flow graphs

UNIT II

Microwave Waveguide Components: Microwave junctions, Bends, Scattering matrix E and H plane tee junctions, Magic-T , Applications of Magic-T, Microwave propagation in ferrites, Principles of Faraday rotation, Gyrator, Isolator and Circulator,

UNIT III

Waveguide Components, Mode transducers, Waveguide discontinuities, Terminations, Attenuators and Phase shifters, Rotary joints, Mechanical and gas type switches.

UNIT IV

Microwave Passive Components: Wave meters, Attenuators, Directional coupler, Scattering matrix of directional couplers, Coaxial and Strip line components: Terminations, Connectors and Transitions, Attenuators and phase shifters, Transmission line discontinuations, DC Returns and blocks, Low pas filters, MICS.

UNIT V

Microwave Resonators and Filters : Review of resonant circuits, Principles of microwave resonators, Field analysis of cavity resonators, Narrow band microwave filters, Wideband microwave filters, Some applications, Introduction to YIG filter, Scattering matrix of two-port gyrator networks.

Text Books:

1. Foundations of Microwave Engg – R.E. Collins, TMH
2. "Microwave Engineering" by P.A. Rizzi, Pearson Education, 2007
3. Microwave Engineering Fourth Edition by Pozar, Pearson Education, 2005

Reference Books:

1. "Microwave Engineering": Non-reciprocal active and passive circuits by Joseph Helszajn McGraw Hill, 1992.
2. Microwave & Radar Engineering – M. Kulkarni.
3. Gintton,EL, Microwave Measurements, Mc Graw Hill
4. Sucher & Fox, Microwave Measusrement, Vol.1, II, III
5. Microwave Engineering – Annapurna Das and Sisir K. Das ,TMH, 2000.
6. Microwave measurements- R. Chatterjee

B.Tech. (ECE) – VIII SEMESTER

EUREC833: INFORMATION THEORY & CODING

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

REVIEW OF PROBABILITY THEORY: Statistical Model, Probabilistic Model, Conditional Probability, Theorem Of Total Probability, Bayes Theorem, Random Variable Theory, Gaussian Distribution, Random Process

UNIT II

REVIEW OF INFORMATION THEORY: Measure Of Information, Zero Memory And Markov Model, Mutual Information.

UNIT III

SOURCE CODING: Lossless Coding " Krafts Inequality, Shannon Encoding Algorithm, Shannon-Fano Codes, Prefix Code, Huffman Codes, Arithmetic Code, Lempel-Ziv-Welch Algorithm, Lossy Coding-Quantization, Vector Quantization, Transform Coding, Sub-band Coding, Predictive Coding, Introduction To Coding Standards.

UNIT IV

CHANNEL MODELLING: Modeling Of Information Channel, Discrete Memoryless Channel, Channel Capacity, Shannon Limit, Channel Coding, BSC, BEC, Cascaded Channels.

UNIT V

ERROR CONTROL CODING: Introduction To Galios Field, Hamming Distance, Linear Block Codes, Cyclic Code, BCH Codes, Convolution Code, Viterbi Coding, Trellis Code.

Text Books:

1. Information Theory, Coding And Cryptography, Bose R., Tata McGraw-Hill, International Ed., 2002.
2. Communication Systems Fifth Edition by Bruce Carlson, TMH Publications

Reference Books:

1. Communication Systems., . Haykin S., 4th Ed., John Wiley & Sons, 1st Ed., 2001.
2. Information Theory And Coding., Giridhar K., Pooja Publications, 1st Ed., 2001.
3. Digital Communication., Bhatacharya A., McGraw-Hill, 1st Ed., 1998.
4. Cryptography And Network Security Principles And Practices., Stallings W., Pearson Education, 3rd Ed., 2007.

B.Tech. (ECE) – VIII SEMESTER

EUREC834: ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

INTRODUCTION: History Of EMI/EMC, Analysis Of EMI, Type Of Noise And Interference, Electromagnetic Compatibility, Benefits Of Good EMC Design, EMC Regulations (Government, Commercial And Military), Examples Of EMC Related Problems

UNIT II

EMC REQUIREMENTS FOR ELECTRONIC SYSTEMS: Radiated Emission Limits For Class A, Class B, FCC And CICPR, Measurement Of Emissions For Verification Of Compliance, Radiated Emission And Susceptibility, Conducted Emissions And Susceptibility, Typical Product Emissions, Additional Product Requirements, Design Constraints For Products, Advantages Of EMC Design

UNIT III

CONDUCTED EMISSION AND SUSCEPTIBILITY: Measurement Of Conducted Emission: LISN, Common And Differential Mode Currents, Power Supply Filters, Basic Properties Of Filters, A Generic Topology, Effect Of Filter Elements On Common And Differential Mode Currents, Separation Of Conducted Emissions In to Common And Differential Mode Components For Diagnostic Purpose, Power Supplies: Linear And SMPS, Effect Of Power Supply Components On Conducted Emissions, Power Supply And Filter Placement, Conducted Susceptibility. RADIATED EMISSION AND SUSCEPTIBILITY: Simple Emission Models For Wires And PCB Lands: Differential Mode Versus Common Mode Currents, Differential Mode Current Emission Model, Common Mode Current Emission Model, Current Probes, Simple Susceptibility Models For Wires And PCB Lands: Shielded Cables And Surface Transfer Impedance

UNIT IV

CROSS TALK

Three Conductor Transmission Lines And Crosstalk, Transmission Line Equations For Lossless Lines, The Per Unit Length Parameters: Homogeneous Versus Inhomogeneous Media, Wide Separation Approximation For Wires, Numerical Methods For Other Structures, The Inductive-Capacitive Coupling Approximation Model: Frequency Domain Inductive-Capacitive Coupling Model, Time Domain Inductive-Capacitive Coupling Model, Lumped Circuit Approximate Models. Shielded Wires, Inductive And Capacitive Coupling,

Effect Of Shield Grounding, Effect Of Pigtails, Effects Of Multiple Shields, Mtl Model Predictions, Twisted Wires, Inductive And Capacitive Coupling, Effects Of Twist, Effects Of Balancing.

UNIT V

SHIELDING

Shielding Effectiveness, Far Field Sources, Exact Solution, Approximate Solution, Near Field Sources: Near Field Versus Far Field, Electric Sources, Magnetic Sources, Low Frequency, Magnetic Fielding Shielding, Effect Of Apertures.

SYSTEM DESIGN FOR EMC: Shielding And Grounding, PCB Design, System Configuration And Design, Electrostatic Discharge, Diagnostic Tools.

Text Books :

1. Paul Clayton., Introduction to Electromagnetic Compatibility, Wiley Interscience, 2nd Ed., 2006.
2. Ott H. W.,Noise Reduction Techniques In Electronic Systems, Wiley Interscience, 2nd Ed.1988.
3. Goedbloed, Electromagnetic Compatibility, Prentice Hall, 1st English Language Ed.,1993.
4. Kaiser K. L., Electromagnetic Shielding, CRC Press, 1st Ed., 2006.
5. Stallings W., Cryptography And Network Security Principles And Practices, Pearson Education, 3rd Ed., 2007.
6. Michel Mardiguian,EMI Troubleshooting Techniques, McGraw-Hill Professional, 1st Ed., 1999.

B.Tech. (ECE) – VIII SEMESTER
DEPARTMENTAL ELECTIVE - IV
EUREC835/EIRVD833/DIRVDS801/EIRRM834 : DSP PROCESSORS AND ARCHITECTURES

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Review of Digital signal processing. ,the sampling process,Discrte time sequences, discrete fourier transform and FFT, Linear time –invariant systems, digital filters, decimation and Interpolation, analysys and design tool for DSP systems. Computational accuracy IN DSP Implementations: number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D conversion errors, DSP computational errors.D/A conversion errors, compensating filter.

UNIT II

Architectures for Programmable DSP Devices : basic architectural features,DSP computational building blocks. Bus architecture and memory, data addressing capabilities, address generation unit, programmability and program execution, speed issues, features for external interfacing. Programmable Digital Signal Processors: Introduction. Commercial Digital Signal Processing Devices.The Architecture of TMS320C54xx Digital Signal Processors.Addressing Modes of the TMS320C54xx Processors.Memory Spaces of TMS320C54xx Processors.Program Control.TMS320C54xx Instructions and Programming.On-Chip Peripherals.Interrupts. Pipeline Operation of the TMS320C54xx Processors

UNIT III

Implementation of Basic DSP Algorithms: Introduction. The Q-notation. FIR Filters. IIR Filters. Interpolation Filters. Decimation Filters. PID Controller. Adaptive Filters.2-D Signal Processing.Implemenation of FFT Algortihms: Introduction. An FFT Algorithm for DFT Computation.A Butterfly Computation.Overflow and Scaling.Bit-Reversed Index Generation. An 8-point FFT Implementation of TMS320C54xx. Computation of Signal Spectrum

UNIT IV

Interfacing Memory and Parallel IO Peripherals to Programmable DSP Devices: Introduction. Memory Space Organization of the TMS320C54xx Devices. Memory and I/O Signals of the TMS320C54xx Devices. Memory Interface. Parallel I/O. Programmed I/O. Interrupts and I/O. Direct Memory Access (DMA).

UNIT V

Interfacing Serial Converters to a Programmable DSP Device: Introduction.Synchronous Serial Interface between the DSP and an AIC. A Multi-channel Buffered Serial Port (McBSP). The McBSP Programming.A CODEC Interface Circuit.CODEC Programming.A CODEC-DSP Interface Example.Applications: Introduction. A DSP System. DSP Based Biotelemetry System. A Speech Processing System.An Image Processing System.A Position Control System for a Hard Disk Drive. DSP Based Power Meter

Text Book:

1. Digital Signal Processing- Avtar Singh and S. Srinivasan, Thompson Publications, 2004.

Reference Books:

1. Digital signal processors, Archtecture, programming and applications- B. venkata ramani and M. Bhaskar, TMH, 2004.
2. Sen. M. Kuo, Real-Time Digital Signal Processing: Implementations and Applications 2/e, Wiley Publications, 2006
3. Rulph Chassaing, Digital Signal Processing with C6713 and C6416 DSK, 2/e Wiley Publications, 2005.
4. DSP processor fundamentals,Archtecture & Features-Lapsley et al. S. Chand & Co.2000

B.Tech. (ECE) – VII SEMESTER

EUREC841: MOBILE COMMUNICATIONS & NETWORKS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Cellular and Mobile Radio Systems: Introduction to Cellular Mobile System, Performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems Elements of Cellular Radio System Design: General description of the problem, concept of frequency channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a omni directional Antenna system, Cell splitting, consideration of the components of Cellular system Interference: Introduction to Co-Channel Interference, real time Co-Channel interference, Co- Channel measurement, design of Antenna system, Antenna parameters and their effects, diversity receiver, non-co-channel interference-different types.

UNIT II

Cell Coverage for Signal and Traffic: Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, straight line path loss slope, general formula for mobile propagation over water and flat open area, near and long distance propagation antenna height gain, form of a point to point model.

UNIT III

Cell Site and Mobile Antennas: Sum and difference patterns and their synthesis, omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas, high gain antennas. Frequency Management and Channel Assignment: Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells, non fixed channel assignment.

UNIT IV

Handoffs: Handoff, dropped calls and cell splitting, types of handoff, handoff invitation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff, cell splitting, micro cells, vehicle locating methods, dropped call rates and their evaluation.

UNIT V

Digital Cellular and Mobile Networks: GSM architecture, GSM channels, multiple access scheme, TDMA, CDMA.

Text Books:

1. Mobile Cellular Telecommunications, W.C.Y. Lee, McGraw Hill, 2nd Ed, 1989.
2. Wireless Communications, T.S Rappaport, Pearson Ed., 2nd Ed., 2002.

Reference Books:

1. Mobile Cellular Communication, Gottapu Sasibhushana Rao, Pearson Education, New Delhi, 2013.
2. Wireless Communication Technology – R. Blake, Thompson Asia Pvt. Ltd., 2004.
3. Wireless Communication and Networking, Jon W. Mark and Zhqung, PHI, 2005.Cellular & Mobile Communications – Lee, Mc Graw Hill.

B.Tech. (ECE) – VIII SEMESTER
EUREC 8421: ADAPTIVE SIGNAL PROCESSING TECHNIQUES

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Linear optimum filtering and adaptive filtering, linear filter structures, adaptive equalization, noise cancellation and beam forming.Optimum linear combiner and Wiener-Hopf equations, orthogonality principle, minimum mean square error and error performance surface; Steepest – descent algorithm and its stability.

UNIT II

LMS algorithm and its applications, learning characteristics and convergence behaviour, misadjustment; Normalized LMS and affine projection adaptive filters; Frequency domain block LMS algorithm.

UNIT III

Least squares estimation problem and normal equations, projection operator, exponentially weighted RLS algorithm, convergence properties of RLS algorithm; Kalman filter as the basis for RLS filter; Square-root adaptive filtering and QR- RLS algorithm; Systolic-array implementation of QR – RLS algorithm.

UNIT IV

Forward and backward linear prediction; Levinson-Durbin algorithm; Lattice predictors, radient-adaptive lattice filtering, least-squares lattice predictor, QR-decomposition based least-squares lattice filters.

UNIT V

Adaptive coding of speech; Adaptive equalization of wireless channels; Antenna array processing.

Text Books:

1. Haykin, S., “Adaptive Filter Theory”, Pearson Education. 2002.
2. Widrow, B. and Stearns, S.D., “Adaptive Signal Processing”, Pearson Education.1985
3. Manolakis, D.G., Ingle, V.K. and Kogon, M.S., “Statistical and Adaptive Signal Processing”, Artech House.2005.
4. Sayed Ali, H., “Fundamentals of Adaptive Filtering”, John Wiley & Sons. 2003
5. Diniz, P.S.R., “Adaptive Filtering: Algorithms and Practical Implementation”, Kluwer.1997
6. Sayeed, Ali, H., “Adaptive Filters”, Wiley-IEEE Press. 2008.
7. Scharf, L.L., “Statistical Signal Processing: Detection, Estimation, and Time Series Analysis”, Addison-Wesley.1991

B.Tech. (ECE) – VIII SEMESTER
EUREC843: MOBILE COMPUTING

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Mobility: Issues, challenges, and benefits; Review of mobile and cellular communication technology; Review of distributed/network operating systems, ubiquitous computing. Network Programming: Process communication techniques, remote login, ftp, socket programming, RPC, RMI, client-server programming.

UNIT II

Process Migration: Steps, advantages, application taxonomy, alternatives, case study of DEMOS/MP. Mobile Computing: Physical mobility, challenges, limits and connectivity, mobile IP and cellular IP in mobile computing, case study of CODA.

UNIT III

Wireless LANs: Introduction to IEEE 802.11, Bluetooth and IrDA technologies and standards. Mobile Adhoc Networks: Hidden and exposed terminal problems; Routing protocols: DSDV, DSR, AODV.

UNIT IV

Wireless Sensor Networks: Motes, smart dust, TinyOS, routing protocols. Handheld Devices and OS: Palm, HP; PalmOS, Windows CE,Windows Mobile.

UNIT V

Mobile Internet and WAP: WWW programming model, WAP programming model, gateways. Mobile agents: Aglets, Tcl, PMADE.

Text Books:

1. Tanenbaum, A. S., "Computer Networks", 4th Ed., Pearson Education. 2003
2. Milojicic, D., Douglis, F. and Wheeler R., (ed.), "Mobility Processes,Computers and Agents", Addison Wesley.2000
3. Lange, D. B. and Oshima, M., "Programming and Deploying Java Mobile Agents with Aglets", Addison Wesley.1998
4. Schildt, H., "The Complete Reference Java2", 5th Ed., McGraw-Hill. 2002
5. Stevens, W. R., "UNIX Network Programming", Prentice-Hall of India.1998
6. Hansman, U. and Merck, L., "Principles of Mobile Computing", 2nd Ed., Springer.2003

B.Tech. (ECE) – VIII SEMESTER
EUREC844: COMPUTER NETWORKS

Category: DE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Introduction: Uses of computer networks, network hardware, network software, reference models, example networks

UNIT II

Physical Layer: The Theoritical Basis for data communication, guided transmission media, the public switched telephone network, cable television

UNIT III

Data Link Layer: Data link layer design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols

UNIT IV

Medium Access Control Sublayer: the channel allocation problem, multiple access protocols, Ethernet

UNIT V

Network Layer: Store and forward packet switching, routing algorithms, congestion control algorithms, internetworking, the network layer in the internet, Application Layer: DNS-The Domain Name System, Electronic Mail, The world wide web, Multimedia

Text Books :

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan. 3rd Edition TMH.

Reference Books:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Ed., Pearson Ed.
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson

B.Tech. (ECE)
INTER-DEPARTMENTAL ELECTIVE - I

Course Code	Name of the Course Name
EUREC851	Remote Sensing & GIS
EUREC852	Database Management Systems
EUREC853	Software Engineering
EUREC854	Systems Modeling & Simulation
EUREC855	Software Project Management
EUREC856	Artificial Intelligence
EUREC857	Transducers & Signal Conditioning
EUREC858	Biomedical Instrumentation
EUREC859	Power Electronics
EUREC8510	Project Planning and Management
EUREC8511	Neural Networks
EUREC8512	Introduction to Micro Electro Mechanical Systems (MEMS)
EUREC8513	Entrepreneurship

INTER-DEPARTMENTAL ELECTIVE - II

Course Code	Name of the Course Name
EUREC861	Environmental Impact Assessment
EUREC863	Web Technologies
EUREC864	Industrial Electronics
EUREC865	Computer Aided Design
EUREC866	Robotics and Automation
EUREC867	Mechatronics
EUREC868	Education Research & Methodologies
EUREC869	Professional Ethics
EUREC8610	Nanotechnology

B.Tech. (ECE) – VIII SEMESTER
EUREC851: REMOTE SENSING & GIS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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. (ECE) – VIII SEMESTER
EUREC852: DATABASE MANAGEMENT SYSTEMS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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 Books:

1. Database Management Systems – Raghu Ramakrishnan and Johannes Gehrke McGraw-Hill
2. Data System Concepts – H.F.Korth and A.Silberschatz McGraw-Hill
3. Reference Book:
4. Fundamentals of Database System – R.El. Masri and S.B.Navathe

B.Tech. (ECE) – VIII SEMESTER
EUREC853: SOFTWARE ENGINEERING

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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. (ECE) – VIII SEMESTER
EUREC854: SYSTEMS MODELING & SIMULATION

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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.
3. Hayes, Khanna Publications.

B.Tech. (ECE) – VIII SEMESTER

EUREC855: SOFTWARE PROJECT MANAGEMENT

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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 Books:

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

B.Tech. (ECE) – VIII SEMESTER
EUREC856: ARTIFICIAL INTELLIGENCE

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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

Text Book:

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

Reference Book:

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

B.Tech. (ECE) – VIII SEMESTER
EUREC857: TRANSDUCERS & SIGNAL CONDITIONING

Category: IE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Static Characteristics of instruments: accuracy, precision, sensitivity, linearity, resolution, hysterisis, threshold, input impedance – loading effect generalized mathematical model of measurement systems – dynamic characteristics – operational transfer function – zero, first and second order instruments – impulse, step, ramp and frequency responses of the above instruments.

UNIT II

Resistive transducers – Resistance potentiometer – loading effect – strain gauges – gauge factor – types of stain gauges: rosettes, semiconductor stain gauges – strain measuring circuits – resistance thermometers – materials of construction, characteristics – thermo wells – thermistors.

UNIT III

Inductive transducers – Induction potentiometers – variable reluctance transducers – LVDT construction – applications – RVDT – Magneto strictive transducers.Capacitive transducers – variable area type – variable air gap type – variable permittivity type – application as level transducer – capacitor microphone – frequency response.

UNIT IV

Piezoelectric transducers – piezoelectric crystals – accelerometer – Hall effect transducers – Thermocouple transducers – IC sensors for temperature and pressure – Introduction to fiber optic and intelligent sensors.

UNIT V

Signal conditioning – Introduction, Signal conditioning for Differential amplifiers – Instrumentation amplifier – Filters – AC and DC Bridges – A /D and D / A converters.

Text Books:

1. Mechanical measurements and instrumentation, A.K.Sawhney, Dhanpat Raj
2. Industrial instrumentation, D.Patranabis, TMH
3. Measurement systems – application and design, E.O. Doeblin, McGraw Hill

Reference Books:

1. Practical Instrument Transducers, F.G. Oliver, Pitman Publishing Co.
2. Transducers Engg. S. Rangathan, Allied Publishers

B.Tech. (ECE) – VIII SEMESTER
EUREC858: BIOMEDICAL INSTRUMENTATION

Category: IE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Bioelectric Signals and Electrodes: Origin of bioelectric signals – action potentials, Recording electrodes – Skin – contact impedance – Electrodes for ECG – Electrodes for EEG – Electrode for EMG – Electrical conductivity of electrode jellies and creams – microelectrodes.

UNIT II

Physiological Transducers: Pressure transducers, Transudcers for body temperature measurement – Pulse sensors – Respiration sensors.

UNIT III

Biomedicals recorders: Electrocardiograph – Block diagram, ECG leads, effects of artifacts on ECG recordings; Phonocardiograph; Electroencephalograph – Electromyograph – Preamplifier, filters, delay circuits, stimulators.

UNIT IV

Biomedical telemetry: Wireless telemetry – single channel telemetry systems – Temperature telemetry system – Multichannel wireless telemetry system – Multipatient telemetry – Implantable telemetry systems – Transmission of analog physiological signals over telephone lines.

UNIT V

Patient safety: Electric shock hazards – Leakage currents – Test instruments for checking safety parameters of biomedical equipments.

Text Books:

1. R.S.Khandpur, Hand Book of Biomedical Instrumentation, TMH, New Delhi, 2001
2. Cromwell, Weibell and Pfeiffer, Biomedical instrumentation and measurements, Pearson Education 2003.

Reference Book:

1. John. G. Webster., Medical Instrumentation application and design, John Wiley & sons onc., 3rd edition, 1999.

B.Tech. (ECE) – VIII SEMESTER
EUREC859: POWER ELECTRONICS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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. (ECE) – VIII SEMESTER
EUREC8510: PROJECT PLANNING AND MANAGEMENT

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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

B.Tech. (ECE) – VIII SEMESTER
EUREC8511: NEURAL NETWORKS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Fundamentals of artificial Neural Networks – Biological neurons and their artificial models, Neural processing, learning and Adaptation, Neural Network Learning Rules – 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,

UNIT V:

Applications of neural networks - cerebellar model articulation controller, Robot kinematics, Expert systems for Medical Diagnosis.

Text Book:

1. Introduction to artificial Neural System, S.M.Zurada, Jaico Publishing House (1992)

Reference Books:

1. Neural Computing – Theory and Practice, Philip D.Wesserman, Van Nostrand Rein Hold, New York (1989)
2. Neural Networks and Fuzzy Systems, Bart Kosko, Prentice Hall, NJ, (1992)

B.Tech. (ECE) – VIII SEMESTER

EUREC8512: INTRODUCTION TO MICRO ELECTRO MECHANICAL SYSTEMS (MEMS)

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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

UNIT II

1. MUMPs (Multi User MEMS Process): JDS Uniphase MUMPs processing sequence and design rules. Design rules; applications; micro hinges and deployment actuators.
2. CMOS MEMS: CMOS foundry processes, integrated IC/MEMS, MEMS post processing, applications.

UNIT III

1. Thermal Transducers: bimorphs, “heatuators”, cilia arrays.
2. MicroOptoElectroMechanical Systems (MOEMS): Micro Scanners, Digital Mirror Display, Retinal Scanning Display. Grating light valve, coroner cube retroreflector, optical switches, other micro-optical devices.
   Iezoresistivity; Scanning Probe Microscopy: scanning tunneling microscope (STM), atomic force microscope (AFM).

UNIT IV

1. Wireless MEMS: mechanical and electrical resonators, Q-factor, switches, filters.
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.

UNIT V

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

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. (ECE) – VIII SEMESTER
EUREC8513: ENTREPRENEURSHIP

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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.

Reference Books:

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. (ECE) – VIII SEMESTER
EUREC861: ENVIRONMENTAL IMPACT ASSESSMENT

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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. (ECE) – VIII SEMESTER
EUREC863: WEB TECHNOLOGY

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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.

B.Tech. (ECE) – VIII SEMESTER
EUREC864: INDUSTRIAL ELECTRONICS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Thyristors:

PNPN diode: Basic structure. Two transistor version, Volt – Ampere characteristic.Holding current.Temperature dependence. Rate effect, Bilateral PNPN diode switch(DLAC):Basic structure. Volt-Ampere characteristics. Silicon Controlled Rectifier (SCR): Basic structure. Two transistor Representation. Volt-Ampere characteristics.On and OFF times of gate.SCR rating. Silicon Controlled Switch(SCS): Basic structure. Two transistor equivalent.Diodc transistor equivalent. Triac: Basic structure. Volt – Ampere characteristics. Positive bias and Negative bias operations.

UNIT II

Uni Junction Transistor:

Basic structure.Potential divider equivalent Static emitter characteristics.Gate circuit of SCR. Two SCRs connected back-to-back. Delayed firing of SCR by phase shifted A.C. wave. Delayed firing of SCR by UJT.

UNIT III

Polyphase Rectifiers:

Three-phase half-wave delta-wve rectifier with resistive load.Six-phase star half-wave rectifier with resistive load. Delta-to-double wye half-wave rectifier with inter phase transformer and with resistive load. Three-phase delta-wye bridge rectifier with resistive load.General m-phase rectifier. DC power outputs, efficiencies and ripple factors, Transformer utility factor. Rectifier performance.Communication in polyphase rectifiers.

UNIT IV

Resistance Welding & Heating:

Basic circuit for a.c. resistance welding. Spot welding, Projection welding, Butt welding, Scam welding and Pulsating welding arrangements. Induction Heating: Principle of induction heating. Applications.High frequency power source for induction heating. Dielectric Heating: Principle of dielectric heating. Electrodes used in dielectric heating. Methods of coupling of Electrodes to R.F. Generator .Applications.

UNIT V

Controller Rectifiers (outlines of topics only): Single-phase Controlled Rectifiers: Half-wave controlled rectifier with resistance load. Full-wave Controlled rectifier with resistance load. Three-phase Controlled Rectifiers: Half wave controlled rectifier with resistance load, Six-Phase half-wave Controlled rectifier with resistance load. Electronic Speed Control Of Motors(outlines of topics only): DC Motor Speed Control: Methods of speed control, single phase SCR drive. Three phase SCR drives. Closed-Loop motor control system. Half-wave feedback circuit for

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. (ECE) – VIII SEMESTER
EUREC865: COMPUTER AIDED DESIGN

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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 AI in 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.

B.Tech. (ECE) – VIII SEMESTER
EUREC866: ROBOTICS AND AUTOMATION

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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 miscellaneous devices, active and passive grippers.

UNIT II

Robot Drives Actuators and Control: Functions of drive system, general types of control, Pump classification, and introduction to pneumatic systems, electrical drives, DC motor and transfer function, stepper motor, drive mechanisms.

UNIT III

Robot Kinematics: Forward and reverse kinematics of 3 DOF arm, forward and reverse kinematics of 4 DOF arm, Homogeneous transformation, kinematics equations using homogeneous transformations.

UNIT IV

Robot Sensors: Need for sensing systems, types of sensor, robot vision, robot tactile syst5em, proximity sensors.

UNIT V

Robot applications: Capabilities of robots, material handling, machine loading and unloading, machining and fettling robot assembly, welding, future applications. Introductory concepts.

Text Book:

1. Robotics Technology and Flexible Automation by S.R. Deb James L. Fuller

B.Tech. (ECE) – VIII SEMESTER
EUREC867: MECHATRONICS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Introduction: Multi disciplinary Scenario, Origins, Evolution of Mechatronics, An overview of Mechatronics, Introduction to Manufacturing, Design. System modeling: Introduction , system modeling, mechanical system, electrical system, fluid system, thermal systems, translational mechanical system with spring, damper and mass, Rotational mechanical system with spring, damper and mass, modeling electric motor, modeling pneumatic actuator.

UNIT II

Sensors and Transducers: Introduction and background, difference between transducer and sensor, transducers types, transduction principle, photoelectric transducers, thermistors, thermo devices, thermo couple, inductive transducers, capacitive transducers, pyroelectric transducers, piezoelectric transducers, Hall-effect transducers, Fibre optic transducers.

UNIT III

Actuators: Introduction, actuator types and application areas, electromechanical actuators, DC motors, AC motors, Fluid power actuators, piezoelectric actuators.

UNIT IV

Digital logic: Digital logic, number systems, logic gates, Boolean algebra, karnaugh maps, application of logic gates, sequential logic.

UNIT V

Advanced Applications in Mechatronics: Sensors for condition monitoring, mechatronic control in automated manufacturing, artificial intelligence in mechatronics, fuzzy logic applications in mechatronics, microsensors in mechatronics.

Text Book:

1. Mechatronics system design by Devdas Shetty and Richard A. Kolk, PWS publishing company.

Reference Books:

1. Mechatronics : Principles, concepts and applications by Nitaigour Premchand Mahalik, Tata – Mc Graw Hill Publishing Company Ltd.
2. Mechatronics by Bolton, Pearson Education.

B.Tech. (ECE) – VIII SEMESTER

EUREC868: EDUCATION RESEARCH & METHODOLOGIES

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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. (ECE) – VIII SEMESTER
EUREC869: PROFESSIONAL ETHICS

Category: IE Credits: 4 Hours: 4 per week Department: ECE

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, Course 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 Name of the Courses
5. Impartiality in data analysis and professional consulting
6. Professional accountability

Reference:

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

B.Tech. (ECE) – VIII SEMESTER
EUREC8610: NANOTECHNOLOGY

Category: IE Credits: 4 Hours: 4 per week Department: ECE

UNIT I

Introduction

Evolution of science and technology, Introduction to Nanotechnology, Nanotechnology – Definition – Difference between Nanoscience and Nanotechnology, Feynman predictions on Nanotechnology, Moores law, Role of Bottom up and top down approaches in nanotechnology, challenges in Nanotechnology.

UNIT II

Nano materials

History of materials, Nanomaterials – Definition, Classification of Nanostructured materials, cause of interest in nanomaterials, some present and future applications of nanomaterials.

UNIT III

Synthesis and processing of nano powders:

Processes for producing ultrafine powders – mechanical milling, wet chemical synthesis, gas condensation process, chemical vapour condensation, laser ablation.

UNIT IV

Special nanomaterials, characterization and tools:

Carbon nanotubes, nano composites, carbon fullerenes: An overview of preparation, properties applications. Electron Microscopy Techniques: Scanning Electron Microscopy, Transmission Electron Microscopy, Scanning Probe Microscopy – X ray methods:

UNIT V

Nanoelectronics

Introduction to micro, nano fabrication: Optical lithography, Electron beam lithography, Atomic lithography, Molecular beam epitaxy, MEMS:- Introduction, Principles, Types of MEMS:- Mechanical, Thermal, Magnetic MEMS; Fabrication of MEMS.

Text Book:

1. Nano materials by A S Edelstein & R C Cammarata, Institute of physics publishing, Bristc and Philadelphia.

Reference Books:

1. Nano materials by J.Dutta & H.Hofman.
2. Nano structures & Nano materials by Guozhong cao, Imperial college press.
3. Micro manufacturing and Nano Technology by N.P.Mahalik.
4. Nano Technology by mark Ratner & Danier Ratner, Prentice Hall.

B.Tech. (ECE) – VIII SEMESTER

EUREC811: MODERN COMMUNICATIONS LABORATORY

Category: CE Credits: 2 Hours: 3 per week Department: ECE

1. Study of Optical Fiber Trainer Kit.
2. Setup of Analog Link & Voice Link using Optical Media.
3. Setup of Digital Optical Link.
4. Analog & Digital Links by Other Different Methods.
5. Finding Losses in Optical Fiber (1) Attenuation (2) Bending (3) Coupling.
6. Finding the Numerical Aperture of a Given Optical Fiber.
7. TDM Frame Generation, Transmission / Reception Over Optical Fiber Link.
8. Programe to Find Numerical Aperture Using MATLAB Code.
9. Study of Desktop Light Source & Power Meter.
10. Study of Splicing Kit & Practice.
11. Measurement of Antenna Parameters.

B.Tech. (ECE) – VIII SEMESTER
EUREC812: PROJECT

Category: PW Credits: 5 Hours: 9 per week Department: ECE

- A detailed report of the of the work carried out from IV year I semester until the present semester is to be submitted at the end of the IV year II semester
- The work has to be original one
- The work should be continuity of the previous semester work
- Progress of the work is to be assessed at the end of the semester

B.Tech. (ECE) – VIII SEMESTER
EUREC813: COMPREHENSIVE VIVA

Category: CE Credits: 2 Department: ECE

A viva voce examination is to be conducted by an external examiner at the end of the total course work. The examination should be comprehensive covering all the topics learnt by the candidate in his four year course duration of study.