GITAM UNIVERSITY

(Declared as Deemed to be University U/S 3 of UGC Act, 1956)

*** Visakhapatnam * Hyderabad**

SYLLABUS
OF

B.Tech. (Electronics & Communication Engineering)

(w.e.f 2008 -09 admitted batch)

Gandhi Nagar Campus, Rushikonda
VISAKHAPATNAM – 530 045
Website: www.gitam.edu

SYLLABUS

B.Tech. (ECE)

Programme Course Code: EUREC200701

I Semester

Course Code	Name of the Course	Category	*Credits*	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREG101	English Language Skills	Humanities	3	60	40	100	3	0	-	3
EURMT102	Engg. Mathematics I	Maths	4	60	40	100	4	0	-	4
EURPH103	Engg. Physics I	Basic Sc	4	60	40	100	4	0	-	4
EURCH104	Engg. Chemistry I	Basic Sc	4	60	40	100	4	0	-	4
EURCS105	Programming with C	Basic Engg	3	60	40	100	3	0	-	3
EURME115/ 215	Engineering Graphics	Basic Engg	2	-	100	100	-	-	4	4
EURPH112/ 212	Engg. Physics Lab	Basic Sc	2	-	100	100	-	-	4	4
EURCS113	Programming with C	Basic Engg	2	-	100	100	-	-	3	3
Total			**24**	**300**	**500**	**800**	**18**	**0**	**11**	**29**

II Semester

Course Code	Name of the Course	Category	*Credits*	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREG201	English Writing Skills	Humanities	3	60	40	100	3	0	-	3
EURMT202	Engg. Mathematics II	Maths	3	60	40	100	3	0	-	3
EURMT203	Engg. Mathematics III	Maths	3	60	40	100	3	0	-	3
EURPH204	Engg. Physics II	Basic Sc	3	60	40	100	3	0	-	3
EURCH205	Engg. Chemistry II	Basic Sc	3	60	40	100	3	0	-	3
EURCS206	Object Oriented Programming with C++	Basic Engg	3	60	40	100	3	0	-	3
EURPH214/ 114	Engg. Chemistry Lab	Basic Sc	2	-	100	100	-	-	4	4
EUREE218/ 118	Electrical & Electronic Work Shop	Basic Engg	2	-	100	100	-	-	3	3
EURCS213	Object Oriented Programming with C++	Basic Engg	2	-	100	100	-	-	3	3
Total			**24**	**360**	**540**	**900**	**22**	**0**	**10**	**32**

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	Advanced Engg Mathematics	MT	3	60	40	100	3	-	-	3
EUREC302	Probability theory and Random Processes	CE	3	60	40	100	3	-	-	3
EUREC303	Basic Circuit theory	BE	4	60	40	100	3	1	-	4
EUREC304	Electronic Devices & Circuits	BE	4	60	40	100	3	1	-	4
EUREC305	Electrical Machines	BE	3	60	40	100	3	-	-	3
EUREC306	Electromagnetic Waves & Transmission Lines	CE	3	60	40	100	3	-	-	3
EUREC311	Networks & Electrical Machines Lab	BE	2	-	100	100	-	-	3	3
EUREC312	Electronic Devices & Circuits lab	BE	2	-	100	100	-	-	3	3
Total			**24**	**360**	**440**	**800**	**18**	**2**	**6**	**26**

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	Digital Electronics	CE	3	60	40	100	3	-	-	3
EUREC402	Analog Electronic Circuits	CE	3	60	40	100	3	-	-	3
EUREC403	Pulse & Wave Shaping Circuits	CE	3	60	40	100	3	-	-	3
EUREC404	Signals & Systems	CE	3	60	40	100	3	-	-	3
EUREC405	Environmental Studies	HS	4	60	40	100	3	1	-	4
EUREC406	Control Systems	CE	3	60	40	100	3	-	-	3
EUREC411	Digital Electronics lab	CE	2	-	100	100	-	-	3	3
EUREC412	Analog Electronics & Pulse Circuits lab	CE	2	-	100	100	-	-	3	3
EUREC413	English Communication lab	HS	2	-	100	100	-	-	3	3
EUREC414	Industrial Tour	IT	Non Credit Audit Course							
Total			**25**	**360**	**540**	**900**	**18**	**1**	**9**	**28**

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	Microprocessors & Interfacing	CE	3	60	40	100	3	-	-	3
EUREC502	Linear IC's & Applications	CE	3	60	40	100	3	-	-	3
EUREC503	Analog Communications	CE	3	60	40	100	3	-	-	3
EUREC504	Data Structures using C	CE	3	60	40	100	3	--	-	3
EUREC505	Antennas & Wave Propagation	CE	3	60	40	100	3	-	-	3
EUREC506	Computer Architecture & Organization	CE	3	60	40	100	3	-	-	3
EUREC511	Linear ICs 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**	**0**	**9**	**27**

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	VLSI System Design	CE	3	60	40	100	3	-	-	3
EUREC602	Digital Signal processing	CE	3	60	40	100	3	-	-	3
EUREC603	Operating Systems	CE	3	60	40	100	3	-	-	3
EUREC604	Microwave Engineering	CE	3	60	40	100	3	-	-	3
EUREC605	Engg Economics & Management	HS	3	60	40	100	3	-	-	3
EUREC606	Electronic Measurements & Instrumentation	CE	3	60	40	100	3	-	-	3
EUREC611	Digital Signal Processing lab	CE	2	-	100	100	-	-	3	3
EUREC612	Communication Systems lab	CE	2	-	100	100	-	-	3	3
EUREC613	Personality Development	HS	Non Credit Audit Course							
Total			**22**	**360**	**440**	**800**	**18**	**0**	**6**	**24**

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	Radar Engineering.	CE	3	60	40	100	3		-	3
EUREC702	Digital Communications	CE	3	60	40	100	3		-	3
EUREC703	Telecommunication Switching Systems and Networks	CE	3	60	40	100	3		-	3
EUREC721-725	Departmental Elective I	DE	4	60	40	100	3	1	-	4
EUREC731 - 734	Departmental Elective II	DE	4	60	40	100	3	1	-	4
EUREC711	VHDL / Verilog Simulation Laboratory	CE	2	-	100	100	-	-	3	3
EUREC712	Microwave Engineering lab	CE	2	-	100	100	-	-	3	3
EUREC713	Project	PW	3	-	100	100	-	-	6	6
EUREC714	Industrial Training	IT	2	-	100	100	-	-	-	-
Total			26	**300**	**600**	**900**	**15**	**2**	**12**	**29**

VIII Semester

Course Code	Name of the Course	Category	*Credits*	Marks			Hours per week			
				Semester End Exam	Con. Eval.	Total	L	T	P	Total
EUREC841 - 845	Departmental Elective III	DE	4	60	40	100	3	1	-	4
EURECE851 -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	Advanced 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			**21**	**330**	**270**	**600**	**12**	**-**	**12**	**24**

** 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)
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	Computer Networks	DE	4
EUREC725	Satellite Communications	DE	4

DEPARTMENTAL ELECTIVE-II

Course Code	Name of the Course	Category	Credits
EUREC731	Digital Design Through Verilog	DE	4
EUREC732	Digital Image Processing	DE	4
EUREC733	Fiber optic Communications	DE	4
EUREC734	Mobile Communications & Networks	DE	4

DEPARTMENTAL ELECTIVE-III

Course Code	Name of the Course	Category	Credits
EUREC841	Embedded Systems	DE	4
EUREC842	Advanced Computer Architecture	DE	4
EUREC843	DSP Processors & Architecture	DE	4
EUREC844	Wireless Communications and Networks	DE	4
EUREC845	Global Positioning Systems	DE	4

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) First Semester

EUREG 101: English Language Skills

Code: EUREG 101 Category: HS
Credits: 3 Hours: 3 per week
Department: BSH

The fundamental aim of this course is to help the student become a confident and competent communicator in written and spoken English. The methodology in teaching and evaluation shall be oriented towards this end, rather than rote memorization.
Prerequisite: Acquaintance with basic High School Grammar and Composition.

I. A TEXT WITH COMMUNICATIVE APPROACH

The aim of the text is to provide interesting new approach to learning English by providing stimulating and motivating material and a wide range of activities that are meaningful, natural, authentic and useful in day-to-day life. :

"Creative English for Communication" by N. Krishnaswamy & T. Sriraman – Macmillan India Ltd. –(2005 version) (Section – I Communicate - Units 1-6 only)

Unit-I	Textual Lessons 1 & 2 Synonyms & Antonyms, One word substitutes, Words often confused, Phrasal Verbs	(8 Hours)
Unit-II	Textual Lesson – 3 Foreign Phrases, Tenses, Concord	(8 Hours)
Unit-III	Textual Lesson – 4 Error Analysis, Single Sentence Definitions, Paragraph Writing	(8 Hours)
Unit-IV	Textual Lesson – 5 Essay Writing, Dialogue Writing, Reading Comprehension	(8 Hours)
Unit-V	Textual Lesson – 6 Note Making, Précis Writing	(8 Hours)

Text Prescribed: Part – I (Communicate - Units 1 to 6 only) of

- ***Creative English for Communication*, N. Krishnaswamy & T. Sriraman. Macmillan India Ltd. (2005 version)**

Supplementary Reading:

Current English for Colleges,	N. Krishnaswamy & T. Sriraman.	Macmillan.
Examine Your English,	Margaret Maison.	Macmillan.

Note: Figures in parentheses indicate number of approximate expected hours of instruction.

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B.Tech. (ECE) First Semester
ENGINEERING MATHEMATICS – I

Code: EURMT102 Category: MT
Credits: 4 Hours: 4 per week
Department: BSH

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

Unit - I.

Linear Differential Equations of Higher order (12 hours)

Definition, Complete solution, Operator D, Rules for finding complementary function, Inverse operator D, Rules for finding particular integral, Method of variation of parameters.

Unit-II

Equations reducible to Linear Differential Equations and Applications (08 hours)
Cauchy's and Legendre's linear equations, Simultaneous linear equations with constant coefficients and applications of linear differential equations to Oscillatory Electrical circuits LC and LCR Circuits, Electromechanical Analogy.

Unit –III

Multiple Integrals and its Applications : (08 hours)

Double integrals, Change of order of integration, Double integrals in Polar coordinates, Areas enclosed by plane curves, Triple integrals, Volume of solids, Change of variables, Area of a curved surface.

Unit –IV

Special Functions and its Applications: (08 hours)

Beta function, Gamma function, Relation between Beta and Gamma functions, Dirichlet integrals of type I and type II.

Unit-V

Infinite Series (12 hours)

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).

Text Prescribed :

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

References :

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

Note: The figures in parentheses indicate approximate number of expected hours of instruction.

B.Tech. (ECE) First Semester
ENGINEERING PHYSICS – I

Code: EURPH103 Category: BS
Credits: 4 Hours: 4 per week
Department: BSH

The aim of the course is to impart knowledge in Basic Concepts of Physics relevant to Engineering applications.

UNIT - I (9 hours)

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 - Entropy and Probability - Third Law of Thermodynamics.

UNIT - II (9 hours)

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

Electric Field: Calculation of E: Line of Charge, Ring of Charge, and Dipole - Dipole in an Electric Field - Concept of Electric Flux - Gauss's Law - Gauss's Law and Coulomb's Law - Gauss's Law Applications - Capacitance - Parallel Plate Capacitor - Dielectrics and Gauss Law - RC Circuit.

UNIT - III (11 hours)

Electromagnetism: Magnetic Field - Magnetic Force on Current - Torque on a Current Loop - Hall Effect - Ampere's Law - Magnetic Induction for a Solenoid and a Toroid - Force between two Parallel Conductors - Biot Savart Law - Magnetic Induction near a Long Wire - Magnetic Induction for a Circular Loop - Faraday's Law of Induction - Lenz's Law - Inductance - Calculation of Inductance - Inductance for a Solenoid and a Toroid - LR Circuit - Induced Magnetic Fields - Displacement Current - Maxwell's Equations.

UNIT - IV (8 hours)

Dielectric Properties: Introduction - Fundamental Definitions - Local Field - Claussius Mossotti Relation - Different Types of Electric Polarizations (electronic, ionic, and bipolar 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 - V (8 hours)

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.

Prescribed Books :

Physics part I & II, Robert Resnick and David Halliday. Wiley- Eastern Limited.
Solid State Physics, P.K. Palanisamy. Scitech Publications (India) Pvt. Ltd., Chennai.

Reference Books:

Engineering Physics, R.K.Gaur and S.L.Gupta. Dhanpat Rai & Sons, Delhi.
Solid State Physics, S. O. Pillai. New Age International (P) Limited, New Delhi.
Materials Science, Dr. M. Arumugam. Anuradha Agencies, Kumbhakonam.
The Feynman Lectures on Physics, Addison-Wesley.

Note: The figures in parentheses indicate approximate number of expected hours of instruction.

B.Tech. (ECE) First Semester
EURCH 104: ENGINEERING CHEMISTRY-I

Code: EURCH 104 Category: BS
Credits: 4 Hours: 4 per week
Department: BSH

The objective of the Course is to provide knowledge in the basic concepts of the Chemistry of Engineering materials.

Unit –I

Water Technology - Sources and Purification of Water: (8 hours)

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: (8 hours)

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

Unit – III

Crystal Structure, Metals and Alloys: (9 hours)

Classification of solids – Amorphous and Crystalline solids. Types of Crystal Imperfections – point defects – line defects and surface defects. Liquid crystals – properties and applications.

Properties of Aluminium, Iron and Titanium

Selective ferrous alloys: Composition and applications of cast iron, steels, heat resisting steels, stainless steel,

Selective non- ferrous alloys: Brass, Bronze, Aluminium alloys and Titanium alloys.

Unit – IV

Polymers: (9 hours)

Types of Polymerization– Mechanism of addition polymerization-Moulding constituents. Differences between Thermoplastic and Thermosetting resins. Preparation and Properties of Polyethylene, PVC, Polystyrene, Polyamides (Nylon-6:6), Polycarbonates and Bakelite - Engineering applications of Plastics. Examples of simple composite materials - metal matrix and polymer matrix.

Unit – V

Engineering Material Science : (11 hours)

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 Prescribed :

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

Reference Books :

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

Note: The figures in parentheses indicate approximate number of hours of instruction.

B.Tech.(ECE) First Semester

CS 116: PROGRAMMING with C

Code: EURCS 105 Category: BE
Credits: 3 Hours: 3 per week
Department: BSH

The Aim of the course is to acquaint the student with C and the applications of C.

UNIT – I (8 periods)

Variables, Expressions and Basic Input-Output:
Introduction to C, Historical Development of C, Features of C, Compilers, Linker, Preprocessor, Character Set, Constants, Variables, Data Types and Keywords, Type def statement, Operators, Operator – Precedence and Associativity, Typecasting.
Basic Input-Output: Introduction, Single Character Input-Output, String Input-Output, Types of Character in format String, Search sets.

UNIT – II (8 periods)

Control Structures: Introduction, the if statement, if-else statement, Multiway decision, Compound statements, Loops-for Loop, While Loop, do-while Loop, Break statement, Switch statement, Continue statement, Goto statement, simple examples algorithms and flowcharts.

UNIT – III (8 periods)

Functions: Introduction, Function main, where are functions useful, Functions accepting more than one parameter, User Defined and Library functions, Concepts Associated with Functions, Function Parameters, Call by Value and Call by Reference, Return Values, Recursion, Comparison of Iteration and Recursion, Variable Length Argument Lists.
Storage classes: Automatic, Register, Static and external storage classes.

UNIT – IV (8 periods)

Arrays And Strings: Introduction to Arrays, Initialization of Array, How arrays are useful, Multi dimensional Arrays.
Strings: What are Strings, Arrays of Strings and Standard Library String Functions.
Pointers: Introduction, Definition and use of pointers, Address operator, Pointer variables, Dereferencing Pointers, Void Pointers, Pointer Arithmetic, Pointers to Pointers, Pointers and Arrays, Passing arrays to Functions, Pointers and Functions.

UNIT – V (8 periods)

Structures, Unions And Files:
Introduction, Declaring and Using Structures, Structure initialization, Structure within a Structure, Operations on Structures, Array of Structures, Array within Structure, Pointers to Structures, Pointers Within Structures, Structures and Functions,
Unions:, Differences between Unions and Structures, Operations on Union, Scope of a Union, Bit fields.
Files: Introduction, File Structure, File handling functions, File Types, Unbuffered and Buffered Files, Error Handling.

Text Books:
MASTERING **C**, by K R Venugopal, S R Prasad published by Tata McGraw Hill.

Reference Books:
Programming with ANSI and Turbo C by Ashok N. Kamthane, published by PEARSON Education Let us C by Yashwant Kanetkar, published by BPB Publications.

Note: The figures in parentheses indicate approximate number of expected hours of instruction.

B.Tech. (ECE) First Semester

ENGINEERING GRAPHICS LAB

Code: EURME115/215 Category: BE
Credits: 2 Hours: 3 per week
Department: BSH

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)
   (1 hr practice)

2. Introduction to draw commands – line, circle, rectangle, polygon etc.
   (1 hr practice)

3. Introduction to modify commands – extend, trim, chamfer, rotate, etc.
   (1 hr practice)

4. Introduction to dimensioning and object properties.
   (1 hr practice)

5. Engineering Curves – Conics –general method, cycloid, epicycloids, hypocycloid, involutes.
   (1 hr practice)

6. Projection of planes (2 hr practice)

7. Sections and sectional views of solids – prism, pyramid, cylinder, cone
   (2 hr practice)

8. Developments of solids- prism, pyramid, cylinder, cone. (2 hr practice)

9. Intersection of solids- prism to prism, cylinder to cylinder (1 hr practice)

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B.Tech. (ECE)First Semester
ENGINEERING PHYSICS LAB

Code: EURPH 112/212 Category: BS
Credits: 2 Hours: 3 per week
Department: BSH

The main aim of the course is to acquaint the students with basic concepts in 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.

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B.Tech. (ECE) First Semester
PROGRAMMING LAB WITH C

Code: EURCS 113 Category: BE
Credits: 2 Hours: 3 per week
Department: CSE

The aim of the Lab is to acquaint the students with C language. The illustrated list of xperiments is as follows:

1. Write a Program to Read X, Y Coordinates of Three Points and then Calculate the Area of the Triangle formed by them and Print the Coordinates of the Three Points and the Area of the Triangle. What will be the Output from your Program if the Three Given Points are in a Straight Line?
2. Write a Program to Find the Roots of a Quadratic Equation using if else and Switch Statements.
3. 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 (e.g for, while and do. while).
4. Write a Program for Multiplication of Square Matrices.
5. Write a Program to Find Max & Min Elements with their Positions in a Given Array and then Sort the Above Array.
6. Write a Program to Insert an Element into an Array.
7. Write a Function for Transposing a Square Matrix in Place. (In Place Means that You are Not Allowed To have Full Temporary Matrix).
8. Write a Program to Print Fibonacci Series Using Functions.
9. Write a Program to Find the Factorial of a Given Number using Recursion.
10. Write a Program to Find "$^{n}c_{r}$" using Non Recursive Function while Finding the Factorial Value Using Recursive Function.
11. Write a Program to find whether the Given String is Palindrome or not without using string functions.
12. Given an Array of Strings Write a Program to Sort the Strings in Dictionary Order.
13. Develop a program to implement a structure to read and display the Name, Birth date and Salary of ten Employees.
14. Develop a program to display the Name, Marks in five Name of the Courses and total marks of ten students. (Using array of structures).
15. Develop a program to read and write to a file.
16. Develop a program to create and count the number of characters in a file.

B.Tech. (ECE) Second Semester

EUREG 201: English Writing Skills

Code: EUREG 201 Category: HS
Credits: 3 Hours: 3 per week
Department: BSH

This course is specially designed to teach the elements of effective writing and communicative methods, while imparting the essential skills that help personality development.

A Text with communicative and contemplative approach "Creative English for Communication" by N. Krishnaswamy & T. Sriraman – Macmillan India Ltd. –(2005 version) (Section – II Contemplate - Units 7-13)

Unit – I	Textual Lessons - 7 & 8 Preparation of Abstract, Technical Paper Writing	(8 hours)
Unit - II	Textual Lesson – 9 Notices, Minutes of the Meeting	(8 hours)
Unit -III	Textual Lesson - 10 Letter Writing (Letters of Enquiry, Permission, Regret, Reconciliation, Complaint)	(8 hours)
Unit -IV	Textual Lessons - 11 & 12 Drafting Curriculum Vitae, Resume and Covering Letters, Job Applications	(8 hours)
Unit - V	Textual Lesson -13 Memo, E-mail Etiquette	(8 hours)

References :

Technical Communication – Principles and Practic, Meenakshi Raman & Sangeeta Sharma. Oxford University Press.

Communication Skills for Engineers & Professionals, Prasad. S.K.Kataria & Sons.

Creative English for Communication, N.Krishnaswamy & T.Sriraman. Macmillan.

Business Communication and Report Writing, G.S.R.K. Babu Rao. Himalaya Publishing House.

Effective English Communication For You, V.Shyamala. Emerald Publishers.

Communicative Skills for Technical Students, M.Faratullah. Orient Longman.

Practical English Grammar, Thompson & Martinet. Oxford University Press.

Note: Figures in parentheses indicate number of approximate expected hours of instruction.

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B.Tech. (ECE) Second Semester
ENGINEERING MATHEMATICS – II

Code: EURMT202 Category: MT
Credits: 3 Hours: 3 per week
Department: BSH

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

Unit – I (10 hours)

PARTIAL DIFFERENTIATION:

Introduction to Partial differentiation, Total derivative, Differentiation of implicit functions, Geometrical interpretation, Tangent plane and normal to a surface, Change of variables, Jacobians, Taylor's theorem for functions of two variables.

Unit –II 08 hours)

APPLICATIONS OF PARTIAL DIFFERENTIATION :

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 (10 hours)

PARTIAL DIFFERENTIAL EQUATIONS :

Introduction, Formation of partial differential equations, Solutions of partial differential equations, 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-IV (08 hours)

LINEAR ALGEBRA-1:

Rank of Matrix, Elementary transformations, Elementary matrices, Inverse, Normal form, Consistency of linear system of equations, Linear transformations.

Unit-V (10 hours)

LINEAR ALGEBRA – 2:

Eigen values and Eigen vectors of a matrix, Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms and canonical forms, Hermitian and Skew- Hermitian matrix, Unitary matrix.

Text Books Prescribed :

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

References :

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

Note: The figures in parentheses indicate approximate number of expected hours of Instruction.

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B.Tech. (ECE) Second Semester

ENGINEERING MATHEMATICS – III

Code: EURMT203 Category: MT
Credits: 3 Hours: 3 per week
Department: BSH

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

Unit-I (12 hours)

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 and even periodic functions, Half range series and practical Harmonic Analysis.

Unit-II (8 hours)

Laplace Transforms:

Transforms of elementary functions, Properties of Laplace transforms, Existence conditions, Inverse transforms, Transforms of derivatives, Transforms of integrals, Multiplication by t^n, Division by t, Convolution theorem.

Unit-III (8 hours)

Applications Of Laplace Transforms:

Applications to ordinary differential equations and simultaneous linear equations with constant coefficients, Unit step function, Unit impulse function, Periodic functions (without proofs).

Unit-IV (8 hours)

Vector Calculus (Differentiation) :

Scalar and vector fields, Gradient, Divergence, Curl, Directional derivative, Identities, Irrotational and Solenoidal fields.

Unit-V (12 hours)

Vector Calculus (**Integration**) :

Line integral, Surface integral, Volume integral, Green's theorem in a plane, Stoke's and Gauss divergence theorems with proofs, Introduction of orthogonal curvilinear co-ordinates, Cylindrical co-ordinates, Spherical polar co-ordinates (without proof)

Text Prescribed :

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

References :

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

Note: The figures in parentheses indicate approximate number of expected hours of Instruction.

B.Tech. (ECE) Second Semester

ENGINEERING PHYSICS – II

Code: EURPH204 Category: BS
Credits: 3 Hours: 3 per week
Department: BSH

The aim of the course is to impart knowledge in basic concepts of physics relevant to engineering applications.

UNIT - I (9 hours)

Interference: Introduction - Interference in Thin Films - Wedge Shaped Film - Newton's Rings - 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 (9 hours)

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 (10 hours)

Modern 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 (8 hours)

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.

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

UNIT - V (9 hours)

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.

Prescribed Books :

Physics Part I & II, Robert Resnick and David Halliday. Wiley- Eastern Limited.
Solid State Physics, P.K. Palanisamy. Scitech Publications (India) Pvt. Ltd., Chennai.

Reference Books:

Engineering Physics, R.K.Gaur and S.L.Gupta. Dhanpat Rai & Sons, Delhi.
Solid State Physics, S. O. Pillai. New age International (P) Limited, New Delhi.
Materials Science, Dr. M. Arumugam. Anuradha Agencies, Kumbhakonam.
Modern Physics, Arthur Beiser. Tata Mc Graw-Hill.
The Feynman Lectures on Physics, Addison-Wesley.

Note: The figures in parentheses indicate approximate number of expected hours of instruction.

B.Tech. (ECE) Second Semester

EURCH205: ENGINEERING CHEMISTRY-II

Code: EURCH 205 Category: BS
Credits: 3 Hours: 3 per week
Department: BSH

The objective of the syllabus is to provide knowledge in the basic concepts of the Chemistry of Engineering materials.

Unit-I (9 hours)

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 - Fuel Cell: Hydrogen-Oxygen Fuel Cell.

Nuclear : Nuclear Fission and Nuclear Fusion – Applications of Nuclear Energy

Solar : Photoelectric cells –Applications of Solar Cells

Unit-II (11 hours)

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: Cathodic protection, Inhibitors, Metallic coatings – Anodic and Cathodic coatings -Galvanising and Tinning, Anodized Coatings. Organic Coatings-Paints –Characteristics, Constituents and their functions, Varnishes.

Unit-III (9 hours)

Fuel Technology : Calorific Value And Solid Fuels: Classifications of Fuels – Characterstics 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 (8 hours)

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

Unit-V (8 hours)

Lubricants : Classification-Properties- Viscosity ,Oiliness, Flash and Fire - Points, Cloud and Pour - Points. Aniline point, Saponification number, Carbon residue, Emulsification number, Volatility, Precipitation number, Specific gravity and Neutralization number. Principles and Mechanism of Lubrication - Fluid Film, Boundary and Extreme - Pressure Lubrications.

Text Books Prescribed :

Engineering Chemistry, P.C. Jain and M. Jain. Dhanapat Rai & Sons, Delhi.

Engineering Chemistry, B.K.Sharma.Krishna Prakashan,Meerut.

A Textbook of Engineering Chemistry, Sashi Chawla. Dhanapath Rai & Sons, Delhi.

Reference Books :

A Textbook of Engineering Chemistry, S.S.Dara. S.Chand & Co. New Delhi.

Material Science and Engineering, V.Raghavan. Prentice-Hall India Ltd.

Note: The figures in parentheses indicate approximate number of hours of instruction.

B.Tech. (ECE) Second Semester
CS126: OBJECT ORIENTED PROGRAMMING WITH C++

Code: EURCS206 Category: BE
Credits: 3 Hours: 3 per week
Department: CSE

The Aim of the course is to acquaint the student with C++ and the applications of C++

UNIT-I. (8 hours)

Basics, Tokens, Expressions:

Software Crisis, Software Evolution, Procedure Oriented Programming, Object Oriented Programming Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Features of OOP. How OOP Differ from POP. Applications of OOP, A Simple C++ Program, Structure of C++ Program.

Tokens, Keywords, Identifiers and Constants, Basic Data Types, User Defined Data Types, Derived Data Types, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators.

UNIT-II. (8 hours)

Functions, Classes and Objects:

Introduction to Classes, Specifying a Class, Defining a Member Functions, A C++ Program with Class Access Specifiers, Inline functions, Nesting of Member Functions, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Default Arguments, Const Arguments, Function Overloading, Friend Functions

UNIT-III (8 hours)

Constructors, Destructors, Inheritance:

Introduction, 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, Abstract Classes, Constructors in Derived Classes, Containership, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators .

UNIT-IV (8 hours)

Pointers, Virtual Functions and Polymorphism:

Introduction, Memory Management, new Operator and delete Operator, Pointers to Objects, this Pointer, Pointers to Derived Classes, Polymorphism, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions, Virtual Base Classes, Virtual Destructors.

UNIT-V. (8 hours)

Templates and Exception handling:

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

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

Text Book Prescribed :

Object Oriented Programming in C++ by E.Balagurusamy., published by Tata McGraw-Hill.

Reference Book :

1. Mastering C++ by K.R.Venugopal., published by Tata McGraw- Hill.

2. Computer Science A Structural Programming Approach Using C by Behrouz A Forouzan and Richard F. Gilberg, Thomson publishers

B.Tech. (ECE) Second Semester
ENGINEERING CHEMISTRY LAB

Code: EURCH214/114 Category: BS
Credits: 2 Hours: 3 per week
Department: BSH

The objective of the Laboratory Practicals is to make the student to acquire the basic concepts in 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 in Portland cement.

5. Estimation of volume strength of Hydrogen Peroxide.

6 a) Estimation of Active Chlorine Content in Bleaching Powder.

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

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B.Tech (ECE) Second Semester

EUREE218/118:ELECTRICAL & ELECTRONIC WORK SHOP

Code: EUREE218/118 Category: BE
Credits: 2 Hours: 3 per week
Department: EEE

1.	Study of electrical components.
2.	Study of electronic components.
3.	Study of CRO, Signal Generator.
4.	Identification of components with symbols.
5.	One way & two way control.
6	Three way control.
7	Stair case wiring.
8	Godown wiring.
9	Fan connection.
10	Fluorescent tube connection.
11	Volt – Ammeter Method.
12	Half wave diode rectifier.
13	Study of computer components.
14	Soldering Bread-board precautions.
15	Soldering Techniques.
16	PCB Design.

B.Tech. (ECE) Second Semester

OBJECTED ORIENTED PROGRAMMING LAB WITH C++

Code: EURCS 213 Category: BE
Credits: 2 Hours: 3 per week
Department: BSH

The aim of the Lab is for students to get acquainted with C++ language. The illustrated list of experiments is as follows.

1. Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
2. Write a Program to Implement a Class STUDENT having Following Members:

Data members	**Member functions**
Name of the student	to Assign Initial Values
Marks of the student	to Compute Total, Average
	to Display the Data

3. Write a Program to Demonstrate Operator Overloading.
4. Write a Program to Demonstrate Function Overloading.
5. Write a Program to Demonstrate Friend Function and Friend Class.
6. Write a Program to Access Members of a STUDENT Class Using pointer to Object Members.
7. Write a Program to Demonstrate Containership.
8. Write a Program to Generate Fibonacci Series by using Constructor to Initialize the Data Members.
9. Write a Program to Demonstrate Multiple Inheritance.
10. Write a Program to Invoking Derived Class Member Through Base Class Pointer.
11. Write a Template Based Program to Sort the Given List of Elements.
12. Write a Program to Demonstrate Catching of All Exceptions.
13. Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly.
14. Write a Program to Demonstrate Dynamic Binding through Virtual Functions.

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B.Tech. (ECE) III Semester
ADVANCED ENGINEERING MATHEMATICS

Course Code:	**EUREC301**	Category:	**MT**
Credits:	**3**	Hours:	**3 per week**
Department:	**BSH**		

UNITI:

Functions of a complex variable & applications: Functions of a complex variable – analytical functions – Cauchy-Riemann equations – elementary functions of z – conformal mappings – bilinear transformation. Special conformal transformation ($w = z^2$, $w= z+1/z$, $w = e^z$, $w= \cosh z$).

UNITII:

Complex Integration: Cauchy's theorem , Cauchy's integral formula – series of complex functions – Taylor's series – Laurent's series – residue theorem – evaluation of real definite integrals .

UNITIII:

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

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 (P) Ltd., New Delhi-110 002.
3. Higher Engineering Mathematics by Dr.M.K.Venkata Raman, National Pub.Co.,Madras-1.

B.Tech. (ECE) III Semester
PROBABILITY THEORY AND RANDOM PROCESSES

Course Code:	**EUREC302**	Category:	**CE**
Credits:	**3**	Hours	: **3 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, 4tth Edition, 2001.
2. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, PHI, 4th Edition, 2002.

References :

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) III Semester
BASIC CIRCUIT THEORY

Course Code:	**EUREC303**	Category:	**BE**
Credits:	**4**	Hours:	**4 per week**
Department:	**ECE**		

UNIT-I

DC Circuits: Active elements, passive elements, reference directions for current and voltage, Kirchoffs laws, voltage and current division, Nodal analysis, Mesh analysis, Linearity and superposition, Thevenin's and Norton's theorem, Source transformation. Maximum power transform theorem &Reciprocity theorem.

UNIT-II

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

UNIT-III

Sinusoidal Steady State Analysis: The sinusoidal forcing function, Phasor concept, Average and effective values of voltage and current, instantaneous and average power, Complex power, Steady state analysis using Mesh and Nodal analysis, Application of network theorems to AC circuits, Resonance, concept of Duality, Magnetically coupled circuits, DOT convention, Z,Y,H,T-parameters of two port networks.

UNIT-IV

Symmetrical & Asymmetrical Networks: Asymmetrical networks, Image and Iterative impedances. Image transfer constant and iterative transfer constant. Symmetrical networks, characteristic impedance and propagation constant. Properties of L, T and Pi section types. Attenuators and their design, Impedance matching networks.

UNIT-V

Passive Filters: Constant-K filters- low pass, high pass, band pass and band elimination filter design, m derived filters, Composite filters, equalizers.

Text Books:

1. William H. Hayt Jr. and Jack E. Kemmerly, 'Engineering Circuit Analysis', 5th Edition, McGraw Hill.
2. Vanvalkenburg M.E, 'Network Analysis', PHI.
3. Ryder, J.D. 'Networks, lines and fields' , Prentice Hall, 2nd Ed,1991

Reference:

1. 'Network Theory', .Sudhakar & Syammohan, TMH
2. Networks and Transmission lines, T. Anil Kumar, Pearson Edn.

B.Tech. (ECE) III Semester
ELECTRONIC DEVICES AND CIRCUITS

Course Code:	**EUREC304**	Category:	**B E**
Credits:	**4**	Hours:	**4 per week**
Department:	**ECE**		

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

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

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

UNIT-IV
Small Signal – Low Frequency Transistor amplifier Circuits: Transistor as an Amplifier, Analysis of Transistor Amplifier Circuits using h – parameters, Linear analysis of a Transistor circuit, Miller's theorem and it's dual, Simplified CE and CC hybrid models, The CE amplifier with emitter resistance, Darlington pair, Analysis of Single Stage Amplifiers.

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

Text Books:

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

Reference Books:
1.Electronic Devices and Circuits – RL Boylestad & Louis Nashelsky, Pearson Education.
2.Electronic Devices & Circuits, Dharma Raj Cheruku & B T Krishna, 2nd Edition, Pearson Education, 2008.

B.Tech. (ECE) III Semester
ELECTRICAL MACHINES

Course Code:	**EUREC305**	Category:	**BE**
Credits:	**3**	Hours:	**3 per week**
Department:	**EEE**		

UNIT-I

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

UNIT-II

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

UNIT-III

Three– Phase 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
ELECTROMAGNETIC WAVES & TRANSMISSION LINES

Course Code:	**EUREC306**	Category:	**CE**
Credits:	**3**	Hours:	**3 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.

Textbooks:

1. Engineering Electromagnetics, W. H. Hayt Jr., McGraw Hill – New York, 5th edition

2. EM Waves and Radiating Systems, E. C. Jordan, Pearson education, 2nd edition,2007

3. Elements of Electromagnetics, M.N.O.Sadiku, Oxford Press, 2002.

References:

1. Electromagnetic Fields & Transmission Lines, G S N Raju, Pearson Education, 2005.
2. Electromagnetics with Applications, Kraus and Fleisch, McGraw Hill, 1999.
3. Field and wave Electromagnetics, David.K.Cheng, Pearson Education, 2003.

B.Tech. (ECE) III Semester

NETWORKS AND ELECTRICAL MACHINES LABORATORY

Course Code:	**EUREC311**	Category:	**BE**
Credits:	**2**	Hours:	**3 per week**
Department:	**EEE**		

Minimum of TEN experiments to be conducted from the following:

1. Verification of KVL & KCL.
2. Verification of Superposition Theorem.
3. Verification of Thevenin & Norton theorem.
4. Measurement of Two port parameters (Z & Y).
5. Calibration of Wattmeter.
6. Parameters of Choke Coil.
7. Open circuit and short circuit tests on transformer.
8. 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

ELECTRONIC DEVICES AND CIRCUITS LABORATORY

Course Code:	**EUREC312**	Category:	**BE**
Credits:	**2**	Hours:	**3 per week**
Department:	**ECE**		

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Minimum of TEN experiments to be conducted from the following:

1. V-I characteristics of a PN junction diode, Zener Diode & LED.
2. Zener diode Regulator.
3. Half wave Rectifier with and without capacitor filter.
4. Full wave Rectifier with and without capacitor filter.
5. Bridge Rectifier with and without capacitor filter.
6. Characteristics of CB Transistor and its h parameters.
7. Characteristics of CE Transistor and its h parameters.
8. Analysis of Emitter Follower
9. Drain and Transfer Characteristics of JFET.
10. Drain and Transfer Characteristics of MOSFET.
11. Switching Characteristics of BJT.
12. Single stage RC Coupled Amplifier

B.Tech. (ECE) IV Semester

DIGITAL ELECTRONICS

Course Code:	**EUREC401**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

Number Systems and Course Codes: Number systems, conversion of bases - binary arithmetic – binary Course Codes weighted and non-weighted Course Codes – Error detecting and error correcting Course Codes.

Logic Families: Realization of NAND gate using TTL logic and CMOS logic and their comparison.

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Asynchronous Sequential Circuits: Analysis and design of fundamental mode circuits – reduction of flow table – static and dynamic hazards.

Text Books:

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

References:

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. Digital Design by John F. Wakerly, 4th edition, PHI

B.Tech. (ECE) IV Semester
ANALOG ELECTRONIC CIRCUITS

Course Code:	**EUREC402**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

Power Amplifiers: Classification of Power Amplifiers – Class A, Class B and Class AB power Amplifiers. Series Fed, Single Ended Transformer Coupled and Push Pull Class A and Class B Power Amplifiers. Cross-over Distortion in Pure Class B Power Amplifier, Class AB Power Amplifier – Complementary Push Pull Amplifier, Class C Amplifiers, Design considerations – Heat Sinks.

UNIT-V

Tuned Amplifiers: Single tuned amplifier, Double tuned amplifier, Stagger tuned amplifier. **Operational Amplifier:** Introduction to Op Amp, Characteristics of Ideal Op Amp, Block Diagram of Op Amp, Virtual ground Concept, Offset & Error voltages and currents.

Text Books:

1. Integrated Electronics', Millman and Halkias, TMH, New Delhi
2. Pulse & Digital Switching Wave forms by Millman & Taub , TMH

References:

1. Electronic Devices and Circuits – Mottershead, Pearson Education.
2. Electronic Devices & Circuits, Dharma Raj Cheruku & B T Krishna, 2nd edition, Pearson Education, 2008

B.Tech. (ECE) IV Semester
PULSE AND WAVESHAPING CIRCUITS

Course Code:	**EUREC403**	Category:	**C E**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I
Linear Wave shaping Circuits: Elementary signals used in wave shaping circuits, Qualitative and quantitative discussions for all test signals (step ,ramp,exponential,pulse input, symmetrical square wave) for RC circuits, Attenuators, Ringing circuit,

UNIT-II
Non linear wave shaping circuits: Diode characterstics, Design aspects of High pass & Low pass RC circuits, clippers and clampers (all types) and their applications, synchronized clampers .

UNIT-III
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**: Basic considerations of RL circuit, Analysis & design Considerations, Applications.

UNIT-IV
Synchronization & Frequency Division: Pulse Synchronization, Frequency Division in Sweep circuit, Synchronization of sweep circuit with symmetrical signals, Sine wave frequency division with sweep circuit.

UNIT-V
Multivibrators: Design and analysis of Bistable, Monostable & Astable Multi vibrators with BJT. Schmitt trigger circuit, Synchronous and asynchronous triggering. **Blocking Oscillators:** Base Timing, Emitter timing and astable blocking oscillator.

Text books:

Pulse & Digital Switching Wave forms by Millman & Taub , TMH

B.Tech. (ECE) IV Semester
SIGNALS AND SYSTEMS

Course Code:	**EUREC404**	Category:	**CE**
Credits:	**3**	Hours:	**3per week**
Department:	**ECE**		

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Text Book:

1. Signals and systems, Alan V. Oppenheim, Alan S. Willsky and Ian, Pearson Edu.
2. Signals & Systems, P Ramesh Babu, Scitech.
3. Signals & Systems, P Ramakrishna Rao, Tata Mc Graw Hill, 2008.

References:

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

B.Tech. (ECE) IV Semester
ENVIRONMENTAL STUDIES

Course Code:	**EUREC405**	Category:	**HS**
Credits:	**4**	Hours:	**4 per week**
Department:	**Civil Engg.**		

UNIT-I

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

UNIT-II

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystems: Forest ecosystems, Grassland ecosystems, desert ecosystems. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). **Biodiversity and its conservation**: Introduction: Definition: genetic, species of ecosystem diversity. Bio-geographical classification of India. Value of Biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, national and local levels. India as a mega-diversity nation. Hotspots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III

Environmental Pollution: Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards. Solid waste management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies, Disaster Management: floods, earthquakes, cyclones and landslides.

UNIT-IV

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

UNIT-V

Human 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 Book:

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

B.Tech. (ECE) IV Semester
CONTROL SYSTEMS

Course Code:	**EUREC406**	Category:	**CE**
Credits:	**3**	Hours:	**3 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.

Textbook:

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

Reference books:

Modern Control Engineering, Ogata, PHI publication

2. Automatic Control Systems, Benjamin C. Kuo, PHI publication.

B.Tech. (ECE) IV Semester
DIGITAL ELECTRONICS LABORATORY

Course Code:	**EUREC411**	Category:	**CE**
Credits:	**2**	Hours:	**3 per week**
Department:	**ECE**		

Minimum of TEN experiments to be conducted from the following:

Minimization and realization of a given function using gates
Function generation using deCourse Coders and multiplexers
Experiments on priority enCourse Coder using 74LS148
Applications of multiplexers
Seven-segment display experiments
Four bit and eight bit adders and subtractors
Experiments using 74LS181 and 74LS182 ICs (ALU and Carry look ahead adders)
Experiments on SR latch and Master-Slave JK flip-flops using SSI gates
Design and testing of ripple counters using ICs (binary and mod-N)
Design and testing of Mod-N synchronous counters
Design and testing of Shift registers, Ring and Johnson Counters
Experiments using ROMs

B.Tech. (ECE) IV Semester
ANALOG ELECTRONICS & PULSE CIRCUITS LABORATORY

Course Code:	**EUREC412**	Category:	**CE**
Credits:	**2**	Hours:	**3 per week**
Department:	**ECE**		

PART 'A'

Minimum of FIVE experiments to be conducted from the following:

Feedback Amplifier - Calculation of Gain, Input Resistance, Output Resistance with and without feedback, Frequency Response Characteristic.

Colpitts Oscillator.

RC Phase - Shift Oscillator.

Wien - Bridge Oscillator.

Class A Power Amplifier

Class B Push - Pull Power Amplifier.

Tuned Voltage Amplifier.

PART 'B'

Minimum of FIVE experiments to be conducted from the following:

RC Differentiator & RC Integrator.
Clipping Circuits.
Clamping Circuits.
UJT Voltage Sweep Generator.
Bisatble Multivibrator
Monostable multivibrator
Astable Multivibrator

B.Tech. (ECE) IV Semester
ENGLISH COMMUNICATION SKILLS LABORATORY

Code: EUREC413 Category: HS
Credits: 2 Hours: 3 per week
Department: BSH

1. Concept and importance of communication.
2. Developing communicative abilities.
3. Paper Presentation – planning, preparation and presentation using audio-visual aids.
4. Proposals and Research Reports.
5. Oral Presentation:
   a. Group Discussion.
   b. Interviews
   c. Conducting a meeting.
   d. Telephone Etiquette.

Suggested Texts:

1. *Business Communications. A Guide to Effective Writing, Speaking and Listening,* Himstreet, William C., Gerald W.Maxwell, Mary Jean Onorato. Gelencoe Publishing Company. California 1982.

2. *Effective Business Communications,* Murphy, Hurta A etal. Tata McGraw Hill Companies Inc. 1997.

3. *Excellence in Business Communication,* Thill, John V., Bove'e, Courland L. Tata McGraw Hill Companies Inc. 1996.

4. *Report writing for Business,* Lesitar & Pettit. Irwin – McGraw Hill Companies Inc. 1995. Tenth Edition.

5. *Technical Report Writing Today,* Paulery and Riordan. Houghton Mifflin Company. 1999. 5th Edition. Reprint.

B.Tech. (ECE) IV Semester
INDUSTRIAL TOUR

Course Code:	**EUREC414**	Category:	**IT**
Credits:		Hours:	
Department:		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

MICROPROCESSORS AND INTERFACING

Course Code:	**EUREC501**	Category: **CE**	
Credits:	**3**	Hours: **3 per week**	
Department:	**ECE**		

UNIT-I

Intel 8085 microprocessor: Evaluation of microprocessors, Architecture of 8085, pin diagram, addressing modes of 8085.

UNIT-II

Intel 8086 microprocessor: 8086 internal architecture, addressing modes, pin diagram, minimum mode and maximum mode of operation, timing diagrams.

UNIT-III

8086 Programming: Instruction set of 8086, assembler directives, program development steps, constructing the machine Course Codes for 8086 instructions, writing programs for use with an assembler, , writing and using procedures and assembler macros.

UNIT-IV

8086 Interrupts: 8086 interrupts and interrupt responses, priority interrupt controller Intel 8259A.

UNIT-V

Programmable devices and Interfacing of I/O: Addressing memory and ports in microcomputer system, programmable peripheral interface 8255A, programmable timer/ counter 8253/ 8254, serial I/O 8251 USART, DMA controller 8237/ 8257, Interfacing of A/D and D/A converters to 8086 microprocessor. Interfacing a microprocessor to keyboards.

Text Books:

1. Ramesh S Goankar, "Microprocessor Architecture Programming and Applications with the 8085, Perman International Pvt.Ltd.
2. Douglas V Hall, "Microprocessors and Interfacing: Programming and Hardware", 2nd edition, TMH.

Reference Books:

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

B.Tech. (ECE) V Semester
LINEAR ICs & APPLICATIONS

Course Code:	**EUREC502**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

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

UNIT-II

Operational Amplifier Applications: Linear: Inverting and Non-inverting Amplifiers, Differential Amplifiers, Summing, scaling and Averaging amplifiers, Integrators, Differentiators, Logarithmic Amplifiers, Instrumentation Amplifiers, Voltage to Current and Current to Voltage Converters, Rectifiers, Peak Detectors.

Non-linear: Comparators, Schmitt trigger , Multivibrators, Sinewave oscillators (phase-shift, weinbridge, and Quadrature), Waveform generators (triangular and sawtooth) , Sample and Hold circuits, Analog multiplexers.

UNIT-III

Other Linear IC's: 555 Timers – Monostable and Astable modes, 556 Function Generator ICs and their Applications. Three Terminal IC Regulators, IC 566 Voltage controlled oscillators, IC 565 PLL and its Applications.

UNIT-IV

A/D & D/A Converters: DAC characteristics D to A conversion process; multiplying DAC, 8 bit D to A converter, microprocessor compatibility, AD 558 Microprocessor Compatible DAC, serial DAC's ADC characteristics A to D conversion process; successive approximation ADC microprocessor compatibility, ADC's for microprocessors, AD 670 microprocessor compatible flash converters, frequency response of ADC's.

UNIT-V

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

Text Books:

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

References:

1. Linear Integrated Circuits by S.Salivahanan,V.S.Kanchan Bhaskaran, TMH edition
2. Microelectronics, Jacob Millman and Arwin. W. Grasel, TMH edition
3. Linear Integrated Circuits, Roy Choudary and Vishal.K.Jain, New Age
4. Integrated electronics, Jacob Millman and Christos C. Halkias, MGH.

B.Tech. (ECE) V Semester
ANALOG COMMUNICATIONS

Course Code:	**EUREC503**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

Linear Modulation Systems: Modulation, Frequency Translation, Amplitude modulation, AM equation, Modulation index, Spectrum of AM Signal, AM generation, AM detection, DSBSC- generation & detection, SSB- generation & detection, VSB – generation & detection, power relations, Applications of linear modulation systems, Frequency division multiplexing.

UNIT-II

Angle Modulation: Angle modulation, FM, FM Equation, modulation index, frequency deviation, NBFM, WBFM, Spectrum of FM, Bandwidth of FM, Carson's rule, Phase modulation, Comparison of FM and PM, Generation of FM, Phasor representation of FM and AM, FM demodulation, Pre-emphasis and De-emphasis, power relations, stereophonic FM, Comparison of AM and FM.

UNIT-III

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.

UNIT-IV

Noise in AM and FM: Signal power, Noise power, Signal to noise ratio for DSBSC, SSB and FM, FM threshold effect.

UNIT-V

Radio Transmitters & Receivers: Classification of Radio Transmitters, AM Transmitters, FM Transmitters, Telegraph Transmitters, Telephone Transmitters, SSB Transmitters, Classification of Radio Receivers, TRF Receiver, Superhetrodyne Receiver, Characteristics of Superhetrodyne Receivers, Tracking, Importance of IF, Image Frequency Rejection, equation, Amplitude limiting, AGC, Delayed AGC, AFC.

Text Books:

1. Principles of communication H. Taub and Schilling McGraw Hill.
2. Communications Systems Simon Haykins, PHI.

References:

1. Electronic Communication Systems G. Kennedy, McGraw Hill.
2. Applied Electronics and Radio Engg. GK. Mithal
3. Modern Digital and Analog Communications Systems B. P. Lathi, BSP.

B.Tech. (ECE) V Semester
DATA STRUCTURES using 'C'

Course Code:	**EUREC504**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

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

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

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

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

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

Text Books:

1. Programming in ANSIC – E Balaguruswamy
2. Data Structures using C, - A.M. Tanebaum and others 2003

Reference Books:

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

B.Tech. (ECE) V Semester
ANTENNAS & WAVE PROPAGATION

Course Code:	**EUREC505**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

Antenna Fundamentals: Antenna Radiation Mechanism, Properties of Antennas, Directional Characteristics of Dipole Antennas, Traveling Wave Antennas, Effect of the Feed, Standing Wave Antennas, Antenna Gain, Directivity, Effective Area, Antenna Terminal Impedance, Characteristic Impedance of Antennas, Antenna Temperature and Signal to Noise Ratio.

UNIT-II

Radiation: Potential Functions, Electromagnetic Fields, Potentials Functions for Sinusoidal Oscillations, Alternating Current Element, Power Radiated by a Current Element, Applications to Short Antennas, Assumed Current Distributions, Radiation From Quarter Wave Monopole, Radiation from a Half-wave Dipole, Far and Near Fields.

UNIT-III

Antennas for Communications and Radar Applications: Concept, construction, design principle, applications, limitations and parameters of - Dipoles, Folded Dipoles, loop antennas, V - Antennas, Rhombic and Yagi-Uda Antennas, Log – Periodic, Helical Antennas, Reflector Antennas, Lens and Horn Antennas, Slot and Micro-strip Antennas. **Antenna Measurements:** Antenna parameter measurement test setup, anechoic chamber, GTEM cell, antenna test ranges, sources of error in antenna measurements, measurement of - Input and Mutual Impedances, Radiation Pattern, Gain, Phase Front and Polarization.

UNIT-IV

Array antennas and Synthesis: Concept of Array antennas, Uniform Linear Arrays, Broadside and End-fire Arrays, Radiation Characteristics, Side-lobe and Beam-width Requirements, Multiplication of Patterns, Binomial Arrays, Effect of Earth on Radiation Patterns, Methods of Array Synthesis, Tchebyscheff Distribution, Super Directive Arrays, Fourier Transform Method, Woodward Method.

UNIT-V

Wave Propagation: Ground Wave Propagation, Estimation of Ground Wave Field Strength, Space Wave Propagation, Effect of Curvature of Earth, Shadow Zone and its Effects, Atmospheric Effects on Space Wave Propagation, Duct Propagation, Wave Tilt of Surface Wave, Inonospheric Wave Propagation, Inonospheric Layers, Reflection and Refraction of Wave in Ionosphere, MUF, Skip Distance, Critical Frequency, Virtual Height, Effect of Earth's Magnetic Field, Fading, LOS and Faraday's Rotation.

Textbooks:

1. EM Waves and Radiation Systems, E. C. Jordan and K. G. Balmain, PHI–N. Delhi, 1997

Reference Books:

1. Antennas & Wave Propagation, G S N Raju, Pearson Education, 2004

2. Antenna Theory and Practice, Rajeswari Chatterjee, Wiley Eastern Ltd. – N. Delhi

3. Electronic and Radio Engineering, F. E. Terman, McGraw Hill – N. York,

B.Tech. (ECE) V Semester
COMPUTER ARCHITECTURE & ORGANIZATION

Course Code:	**EUREC506**	Category:	**CE**
Credits:	**3**	Hours:	**3 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

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 and I/O Organization: Memory hierarchy – main memory – associative memory – cache memory – virtual memory, Peripheral devices – input/output interface – asynchronous data transfer – modes of transfer – priority interrupt – direct memory access .

Text Book:

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

References:

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) V Semester
LINEAR INTEGRATED CIRCUITS LABORATORY

Course Code: **EUREC511** Category: **CE**
Credits: **2** Hours: **3 per week**
Department: **ECE**

1.Study of Inverting & Non inverting Op Amp Characteristics.

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

B.Tech. (ECE) V Semester
MICROPROCESSORS LABORATORY

Course Code: **EUREC512** 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

ELECTRONIC CIRCUIT SIMULATION LABORATORY

Course Code:	**EUREC513**	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
VLSI SYSTEM DESIGN

Course Code:	**EUREC601**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I
Review of microelectronics and introduction to MOS technology:
Introduction MOS and related VLSI technology, NMOS, CMOS, BICMOS, GaAs Technologies, thermal aspects of processing, production of E beam masks.

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

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

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

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

Test book:

1. Basic VLSI design by Douglas A, Pucknell, Kamran Eshraghian, Prantice-Hall,1996 3rd edition

Reference book:

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

B.Tech. (ECE) VI Semester

DIGITAL SIGNAL PROCESSING

Course Code:	**EUREC602**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

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

UNIT-II

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

UNIT-III

Design of IIR filters: Design of IIR filters from analog filters, Butterworth filters, Chebyshev filters, frequency transformations, design examples, Impulse invariant and Step invariant filters, Bilinear transformation method.

UNIT-IV

Design of FIR filters, linear phase characteristics, Fourier series method, window function technique, comparison between IIR and FIR filters.

UNIT-V

DSP architecture for signal processing, Harvard architecture, pipelining, hardware multiplier, accumulator, general purpose digital signal processors, Fixed point digital processors, floating point digital signal processors. **Applications of DSP:** in spectrum analysis and filtering, Application of DSP in audio applications, telecommunication and bio-medical.

Text Book:

2. Oppenheim A.V.& Schafer R.W- Digital signal processing, PHI.
3. Digital Signal Processing, P.Ramesh Babu, Scitech Publications

References:

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.

B.Tech. (ECE) VI Semester

OPERATING SYSTEMS

Course Code:	**EUREC603**	Category:	**CE**
Credits:	**3**	Hours:	**3 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 – Evaluation of 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 – Software and hardware approaches – semaphores – Monitors – Message Passing – Readers Writers Problem. **Principles of deadlock** – deadlock prevention, detection and avoidance dining philosophers problem – example Systems.

UNIT – III

Memory Management : Memory Management requirements – loading programmes in to main memory – 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 System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition– 2005, Pearson Education/PHI

References :

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

B.Tech. (ECE) VI Semester
MICROWAVE ENGINEERING

Course Code:	**EUREC604**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

Guided EM waves and waveguides: EM waves between parallel planes, TE, TM and TEM waves, Waves in rectangular wave guides and circular wave guides, Velocity of propagation, Cavity resonators- Rectangular and Circular cavity resonators, Quality factor of cavity resonator, Strip line and Microstrip transmission lines.

UNIT-II

Microwave Tubes : High frequency limitations of conventional tubes, Reentrant cavities, Klystrons, velocity modulation process, bunching process, output power and beam loading. Multicavity 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. Principle of operation, 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 Solid State Devices: Classification, GUNN diode principle of operation, modes IMPATT diode, TRAPATT diode, 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.

Textbooks:

1. Microwave Devices and Circuits - Samuel Y. Liao, PHI
2. Microwave & Radar Engineering – M. Kulkarni.
3. Microwave Engineering – Dharma Raj Cheruku, Scitech Publishers, Chennai 2009.

References:

1. Foundations of Microwave Engg – R.E. Collins, TMH.

B.Tech. (ECE) VI Semester
ENGINEERING ECONOMICS & MANAGEMENT

Course Code:	**EUREC605**	Category:	**HS**
Credits:	**3**	Hours:	**3 per week**
Department:	**Mech/IPE**		

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. Economics – Paul A. Samuelson and William D. Nordhaus.
2. Engineering Economics – Vol. 1 – Tara Chand.
3. Financial Management – S. N. Maheswari.
4. Essentials of Management – Koontz and O' Donnel.
5. Production and Operation Management – B. S. Goel.
6. Modern Production / Operation Management – Elwood S. Buffa, Rakesh K. Sarin.
7. Industrial Law - S. P. Jain.
8. Industrial Law - R. P. Maheswari and S. N. Maheswari.
9. Labour and Industrial Laws – Singh, Agarwal and Goel.

B.Tech. (ECE) VI Semester
ELECTRONIC MEASUREMENTS & INSTRUMENTATION

Course Code:	**EUREC606**	Category:	**CE**
Credits:	**3**	Hours:	**3 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.

References:

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

B.Tech. (ECE) VI Semester
DIGITAL SIGNAL PROCESSING LABORATORY

Course Code:	**EUREC611**	Category:	**CE**
Credits:	**2**	Hours:	**3 per week**
Department:	**ECE**		

Part – I Matlab

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

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 Book:

Digital Signal Processing – A Computer Based Approach By Sanjay K. Mitra, Tata McGraw Hill Publications.

Ifeacher E.C & Jervis B.W, digital signal processing –A practical approach, Pearson Edu.

B.Tech. (ECE) VI Semester
COMMUNICATION SYSTEMS LABORATORY

Course Code:	**EUREC612**	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) VI Semester
PERSONALITY DEVELOPMENT

Course Code:	**EUREC613**	Category:	**HS**
Credits:	**Noncredit Course**	Hours:	**2 per week**
Department:	**ECE**		

B.Tech. (ECE) VII Semester
RADAR ENGINEERING

Course Code:	**EUREC701**	Category:	**CE**
Credits:	**3**	Hours:	**3 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) VII Semester
DIGITAL COMMUNICATIONS

Course Code:	**EUREC702**	Category:	**CE**
Credits:	**3**	Hours:	**3 per week**
Department:	**ECE**		

UNIT-I

Discrete modulation techniques: Sampling, sampling Theorem for low pass and bandpass signals, Time Division Multiplexing, Pulse Amplitude Modulation, Channel bandwidth of a PAM signal, natural Sampling, Flat top sampling, signal recovery through holding, Pulse time modulation - Pulse Width Modulation and Pulse Position Modulation – generation and detection.

UNIT-II

Introduction to Digital Communications: Basic signal processing operations in digital communications, channels for digital communications, some historical notes,

UNIT-III

Digital Modulation Techniques: Pulse Course Course CodeModulation, Differential Pulse Course Course CodeModulation, Delta Modulation, Adaptive Delta Modulation, Continuously Variable Slope Delta Modulation, Companding, Binary Phase Shift Keying, Differential Phase Shift Keying, Differentially EnCourse Coded PSK (DEPSK), Quadrature Phase Shift Keying (QPSK), M-ary PSK, Amplitude Shift keying (ASK), Binary Frequency Shift-Keying, QFSK, M-ary FSK, Minimum Shift Keying (MSK), Comparison of FSK and PSK, Duo-Binary Encoding.

UNIT-IV

Data Transmission: Base band Signal Receiver, Probability of Error, The Optimum Filter, White Noise, The Matched Filter, Probability of error of the Matched filter, Coherent Reception: Correlation, Phase Shift Keying Frequency Shift keying, Non-coherent Detection of FSK, Differential PSK, Four Phase PSK (QPSK), Error Probability for QPSK, Probability of Error of minimum Shift Keying (MSK), Comparison of Modulation Systems.

UNIT-V

Information theory: Discrete messages-the concept of amount of information, entropy, rate of information, coding to increase the average information per bit, Shannon's theorem, Channel Capacity, Bandwidth S/N trade off, Coding , parity bit coding for error detection, Coding for error detection and correction, block Course Codes, upper bounds of BER with coding , Algebraic Course Codes, Burst error Course Codes, Convolutional coding, Decoding methods of convelutional coding.

Text Books:

1. Principles of communication H. Taub and Schilling McGraw Hill.
2. Digital Communications Systems Simon Haykins (Chapter 2)

References:

1. Digital communications J G Proakis McGraw Hill.

B.Tech. (ECE) VII Semester

TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS

Course Code:	**EUREC703**	Category:	**CE**
Credits:	**3**	Hours:	**3 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
DEPARTMENTAL ELECTIVE -I

Hours: **4 per week** Department: **ECE**

Course Code	Name of the Course	Category	Credits
EUREC721	Television Engineering	DE	4
EUREC722	Microcontrollers & Applications	DE	4
EUREC723	Speech Processing	DE	4
EUREC724	Computer Networks	DE	4
EUREC725	Satellite Communications	DE	4

B.Tech. (ECE) VII Semester

DEPARTMENTAL ELECTIVE – I
TELEVISION ENGINEERING

Course Code: **EUREC721** 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 Book:

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
DEPARTMENTAL ELECTIVE – I
MICROCONTROLLERS AND APPLICATIONS

Course Code:	**EUREC722**	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
DEPARTMENTAL ELECTIVE – I
SPEECH PROCESSING

Course Code:	**EUREC723**	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.
3.

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
DEPARTMENTAL ELECTIVE – I

COMPUTER NETWORKS

Course Code:	**EUREC724**	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) VII Semester
DEPARTMENTAL ELECTIVE – I

SATELLITE COMMUNICATIONS

Course Code:	**EUREC725**	Category:	**DE**
Credits:	**4**	Hours:	**4 per week**
Department:	**ECE**		

UNIT-I

Introduction : History, The Indian Scenario, Frequency allocation, Basic Satellite systems, Satellite orbits, Geostationary orbit, Orbital parameters and perturbations, Eclipse.

UNIT-II

Satellite link design and Space craft: Basic link analysis, Attenuation and interference effects, Uplink, Downlink and Satellite link design, Space craft: Lifetime and Reliability, Subsystems of Satellite – Transponder, Antenna, Attitude Control, Propulsion system, Telemetry, Tracking & Control, Power system, Thermal Control System and Structure subsystems.

UNIT-III

Modulation and Multiplexing techniques: Introduction, Signal sources, Analog transmission systems, Frequency division multiplexing, Frequency modulation, Digital transmission systems, Source coding, Digital modulation and demodulation, TDM.

UNIT-IV

Multiple access : Introduction, FDMA, Single and Multiple channel per carrier, FDM/FM/FDMA link, TDMA, TDMA frame structure and frame efficiency, TDMA super frame structure, Frame acquisition and synchronization, CDMA, PN sequence, Direct sequence and Frequency hopped spread spectrum system, Demand assignment multiple access, Demand assignment TDMA, SCPC-DAMA, SPADE.

UNIT-V

Earth station: Design considerations, General configuration, Antenna systems, Feed system, Tracking system, High power amplifier, Low noise amplifier, Earth station equipment.

Text Books:

1. Satellite Communication, Dharma Raj Cheruku, IK International Publishing House, New Delhi, 2009.
2. Satellite Communication, T. Pratt and S. W. Bostian, John Wiley and Sons.
3. Satellite Communication, D. C. Agarwal, Khanna Publishers.

B.Tech. (ECE) VII Semester
DEPARTMENTAL ELECTIVE -II

Hours: **4 per week** Department: **ECE**

Course Code	Name of the Course	Category	Credits
EUREC731	Digital Design Through Verilog	DE	4
EUREC732	Digital Image Processing	DE	4
EUREC733	Fiber Optic Communications	DE	4
EUREC734	Mobile Communications & Networks	DE	4

B.Tech. (ECE) VII Semester
DEPARTMENTAL ELECTIVE – II
DIGITAL DESIGN THROUGH VERILOG

Course Code:	**EUREC731**	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
DEPARTMENTAL ELECTIVE – II

DIGITAL IMAGE PROCESSING

Course Code:	**EUREC732**	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.

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Text Books:

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

Reference Books:

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

B.Tech. (ECE) VII Semester
FIBER OPTIC COMMUNICATIONS

Course Code:	**EUREC733**	Category:	**CE**
Credits:	**4**	Hours:	**3 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:

Optical Fiber Communications – Gerd Keiser, McGrawHill International Ed., 3rd Edition, 2000.
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) VII Semester
DEPARTMENTAL ELECTIVE –II

MOBILE COMMUNICATIONS & NETWORKS

Course Code:	**EUREC734**	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. Wireless Communication Technology – R. Blake, Thompson Asia Pvt. Ltd., 2004.
2. Wireless Communication and Networking, Jon W. Mark and Zhqung, PHI, 2005.
3. Cellular & Mobile Communications – Lee, Mc Graw Hill.

B.Tech. (ECE) VII Semester
VHDL/VERILOG SIMULATION LABORATORY

Course Code: **EUREC711** 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 deCourse Coders, 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:

VHDL Primer J. Bhasker, Pearson Education, India

Digital Systems Design Using VHDL by Charles H. Roth, Thomson Brookle

B.Tech. (ECE) VII Semester

MICROWAVE ENGINEERING LABORATORY

Course Code:	**EUREC712**	Category:	**CE.**
Credits:	**2**	Hours:	**3 per week**
Department:	**ECE**		

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

B.Tech. (ECE) VII Semester

PROJECT

Course Code:	**EUREC713**	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
INDUSTRIAL TRAINING

Course Code: **EUREC714** Category: **IT**
Credits: **2** Hours:
Department: **ECE**
Remarks:

The student will undergo training in any one of the approved list of Industry by the Head of the Department.

The duration of training should be four to six weeks in summer vacation between their third and final years of study.

The student will submit a detailed report along with the certificate from the industry where they have undergone training to the department for assessment within a month of return from the training.

The student will have to give a seminar on the training program during the semester.

B.Tech. (ECE) VII Semester
DEPARTMENTAL ELECTIVE -II

Hours: **4 per week** Department: **ECE**

Course Code	Name of the Course	Category	Credits
EUREC841	**Embedded Systems**	**DE**	**4**
EUREC842	**Advanced Computer architecture**	**DE**	**4**
EUREC843	**DSP Processors& Architecture**	**DE**	**4**
EUREC844	**Wireless Communications and Networks**	**DE**	**4**
EUREC845	**Global Positioning System**	**DE**	**4**

B.Tech. (ECE) VIII Semester

DEPARTMENTAL ELECTIVE – III

EMBEDDED SYSTEMS

Course Code:	**EUREC841**	Category:	**DE**
Credits:	**4**	Hours:	**4 per week**
Department:	**ECE**		

UNIT-I

Introduction: Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors. **General Purpose Processors:** Basic architecture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT-II

State Machine and Concurrent Process Models: Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT-III

Communication Interface: Need for communication interfaces, RS232 / UART, RS422 / RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT-IV

Embedded / RTOS Concepts: Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex. Mailboxes , Message Queues, Event Registers, Pipes, Signals. Timers, Memory Management, Priority inversion problem, Embedded operating systems Embedded Linux, Real-time operating systems, RT Linux, Handheld operating systems, Windows CE.

UNIT-V

Design Technology: Introduction, Automation, Synthesis, Parallel evolution of compilation and synthesis, Logic Synthesis, RT synthesis, Behavioral Synthesis, Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation, Reuse of intellectual property Course Codes.

Text Books:

Embedded System Design – A Unified Hardware/Software Introduction - Frank Vahid, Tony D. Givargis, John Wiley, 2002.

Embedded / Real Time Systems – KVKK Prasad, Dreamtech Press, 2005.

Reference Books:

1. Embedded Microcomputer Systems – Jonathan W. Valvano, Brooks / Cole, Thompson Learning.
2. An Embedded Software Primer – David E. Simon, Pearson Ed., 2005.
3. Introduction to Embedded Systems – Raj Kamal, TMS, 2002.

B .Tech (ECE) VIII Semester
DEPARTMENTAL ELECTIVE - III

ADVANCED COMPUTER ARCHITECTURE

Course Code:	**EUREC842**	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 Books

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

References

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
DEPARTMENTAL ELECTIVE - III

DSP PROCESSORS AND ARCHITECTURES

Course Code:	**EUREC843**	Category:	**DE**
Credits:	**4**	Hours:	**4 per week**
Department:	**ECE**		

UNIT-I

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.

UNIT-III

Execution Control and Pipelining: Hardware looping, Interrupts, Stacks, Relative Branch support, Pipelining and Performance, Pipeline Depth, Interlocking, Branching effects, Interrupt effects, Pipeline Programming models.

Programmable Digital Signal Processors: Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX Processors, Memory space, Program Control, Instructions and Programming, On-Chip Peripherals, Interrupts and Pipeline Operation of TMS320C54XX Processors.

UNIT-IV

Implementations of Basic DSP Algorithms: The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing. An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

UNIT-V

Interfacing Memory and I/O Peripherals to Programmable DSP Devices: Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a COURSE CODEC interface circuit, COURSE CODEC programming, A COURSE CODEC-DSP interface example.

Text Books:

DSP Processor Fundamentals, Architectures & Features – Lapsley et al. S. Chand & Co, 2000.

Digital Signal Processors, Architecture, Programming and Applications – B. Venkata Ramani and M. Bhaskar, TMH, 2004.

Reference Books:

1. Digital Signal Processing – Jonatham Stein, John Wiley, 2005.
2. Digital Signal Processing – Avtar Singh and S. Srinivasan, Thomson Publications, 2004.

B.Tech. (ECE) VIII Semester
DEPARTMENTAL ELECTIVE – III

WIRELESS COMMUNICATIONS AND NETWORKS

Course Code:	**EUREC844**	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-III

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
DEPARTMENTAL ELECTIVE – III

GLOBAL POSITIONING SYSTEM

Course Code:	**EUREC845**	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.

Textbooks :

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

INTER-DEPARTMENTAL ELECTIVE - I

Course Code: **EUREC851 – EUREC8513** Category: **IE**
Credits: **4** Hours: **4 per week**
Department: **Other Departments**

B.Tech. (ECE) VIII Semester

INTER-DEPARTMENTAL ELECTIVE - II

Course Code: **EUREC861 – EUREC8610** Category: **IE**
Credits: **4** Hours: **4 per week**
Department: **Other Departments**

B.Tech. (ECE) VIII Semester

ADVANCED COMMUNICATIONS LABORATORY

Course Code:	**EUREC811**	Category:	**CE**
Credits:	**2**	Hours:	**3 per week**
Department:	**ECE**		

Generation of PSK Signals and detection

Generation of FSK Signals and detection

PCM Transmission

Differential PCM

Delta Modulation and Detection

Continuously variable slope Delta Modulation

Design of Fiber-Optic Digital Link for Transmission of Digital Signals

Study of Pseudo Random Binary Sequences (PRBS)

Study of Error Check Course Course CodeLogic

Calculation of Attenuation, Coupling losses, Bending losses of Fiber Optic Cable

Study of Electromagnetic / Radio Frequency Interference using Optic Link

Measurement of Antenna Parameters.

B.Tech. (ECE) VIII Semester
PROJECT

Course Code:	**EUREC812**	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

COMPREHENSIVE VIVA

Course Code:	**EUREC813**	Category:	**CE**
Credits:	**2**	Hours:	
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.

B.Tech. (ECE) VIII Semester
EUREC 851 – Elective-I: Remote Sensing & GIS
(Inter department Elective)

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
EUREC 852 – IE-I: Database Management Systems

Prerequisite: File processing

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

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

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

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

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

Text Book:

a. Database Management Systems – Raghu Ramakrishnan and Johannes Gehrke McGraw-Hill

b. Data System Concepts – H.F.Korth and A.Silberschatz McGraw-Hill

Reference Book:

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

B.Tech. (ECE) VIII Semester
EUREC 853 – IE-I: Software Engineering

UNIT I:
Introduction - Software problem – Software Engineering Problem – Software Engineering Approach

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

UNIT III:
Software Requirements Analysis & specification – Software Requirements – Problem Analysis – Requirements Specifications – Validation – Metrics.

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

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

Text Book: An Integrated Approach to Software Engineering by Pankaj Jalot – Narosa Publishers

Reference Book: Software Engineering a practitioner's approach by Pressman

B.Tech. (ECE) VIII Semester
EUREC 854 – IE-I: Systems Modeling & Simulation

UNIT-I

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

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

UNIT-II

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

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

UNIT-III

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

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

UNIT-IV

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

UNIT-V

Random Access Systems:

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

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

Text Books:

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

References :Geoffrey Gordon

B.Tech. (ECE) VIII Semester
EUREC 855 – IE-I: Software Project Management

Unit I: Conventional Software Management, Evaluation of Software Economics.
Unit II: Improving Software Economics.
Unit III: The old way and the new, Life-Cycle Phases.
Unit IV: Artifacts of the Process, Model-Based Software Architectures Workflows of the Process, Checkpoints of the Process, Iterative Process Planning.
Unit V: Project Organisations and Responsibilities, Process Automation.Project Control and Process Instrumentation, Tailoring the process.

Text Book:

1. Software Project Management, A real world guide to success by Joel Henry.

Software Project Management by Royce.
Software Proejct Management in practice by Pankaj Jalote
Quality Software Project Management by Futrell

B.Tech. (ECE) VIII Semester
EUREC 856 – IE-I: Artificial Intelligence

UNIT I: Introduction to Artificial Intelligence, Artifical Intelligence Problems, Artificial Intelligence Techniques, problems, problem space and search-defining the problem as a state space search, Production System, Problem Characteristics.

Heuristic Search Technologies Generate & Test Hill Climbing, Best First search, Problem reduction, Constraint satisfaction, Means Endo Analysis

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

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

UNIT IV: Symbolic Reasoning under uncertainty – Introduction to Non-monotonic Reasoning, logics for Non-monotonic Reasoning, Implementation: depth first search – Dependency – Directed Backtracking. Justification – based truth maintenance, logic based truth maintenance systems Statistical Reasoning – UNIT V: Probability and bayes theorem, Certainity factors and rule – base systems beyesian networks, dempst6er – Shaffer theory.

UNIT-V
Wek & Strong Slot and Filler Structures Sematic nets, Frames, Conceptual dependencies, Scripts
Prescribe Books: Artificial Intelligence – Rich E & Knight K TMH 1991
Reference Book: Artificial Intelligence structures and strategies complex problem solving – George F-Lugar Pearson Education.

B.Tech. (ECE) VIII Semester
EUREC 857 – IE-I: Transducers & Signal Conditioning

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:

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

B.Tech. (ECE) VIII Semester
EUREC 858 – IE-I: Biomedical Instrumentation

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:

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

B.Tech. (ECE) VIII Semester
EUREC 859 – IE-I: Power Electronics

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

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

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

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

UNIT-V AC to AC Converters: Principle of operation of CYclo-converter – single phase to single phase Cyclo-converter – Cyclo-converter circuits – three phase output.

Single phase and three phase voltage controllers using Thyristor and Traic – AC choppers.

Text Books:

1.Power Electronics, M.Rashid. PHI

2.Power Electronics, P.S. Bimbra, Khanna Publishers

3. Power Electronics, Singh M.D. and Khanchandani. TMH

Reference Books:

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

B.Tech. (ECE) VIII Semester
EUREC 8510: IE -I: Project Planning and Management

UNIT–I

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

UNIT- II

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

UNIT–III

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

UNIT–IV

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

UNIT–V

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

Text Book:

Harvey Maylor, Mac Millan India Ltd., Delhi

Reference Book:: Punmia: Laxmi Publications

B.Tech. (ECE) VIII Semester

EUREC 8511: IE -I: Neural Networks

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 Books:

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

References:

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

EUREC 8512: IE -I: Introduction to Micro Electro Mechanical Systems(MEMS)

UNIT I

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

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

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

UNIT II

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

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

UNIT III

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

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

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

UNIT IV

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

2. **Power for MEMS**: thin film batteries, micro fuel cells, energy fields,

MEMS Packaging and Assembly: microassembly: serial and parallel, deterministic and stochastic; microgrippers: HexSil process; packaging techniques (4 hrs)

UNIT V

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

Text Books:

1. Fundamentals of Microfabrication: The Science of Miniaturization, Second Edition ISBN: 0849308267, CRC Press, 1997 by Marc J Madou
2. MEMS a Practical Guide of Design, Analysis, and Applications
   Korvink, Jan, Paul, Oliver
   2006,Approx. 9800 p., Oliver
   ISBN: 3-540-21117-9
3. Mechanics of Microelectromechanical Systems
   Lobontiu, Nicolae, Garcia, Ephrahim
   2004, XII, 405 P.295 illus., Hardcover
   ISBN: 1-4020-8013-1
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
EUREC 8513: IE -I: Entrepreneurship

UNIT I

Introduction:

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

UNIT II

Project Identification And Selection:

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

UNIT III

Sources Of Finance:

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

UNIT IV

Project Appraisal:

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

UNIT V

Ownership Structures & Evaluation Of Edps:

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

Text Books:

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

References:

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

B.Tech. (ECE) VIII Semester
EUREC 861: IE -II: Environmental Impact Assessment

UNIT I: Introduction to EIA. Definition of E IA and EIS.C.E. guidelines in USA, preparation of EIS, Elements of EIA.
UNIT II: Agency Activities, Environmental setting. Environmental attributes, air, water, soil, ecology, noise Socio-Economic aspects, Culture and human aspects (Human settlements – rehabilitations)
UNIT III: Environmental impacts, Identification measurement, Aggregation, Secondary and Cumulative Impacts. Criteria for selection of methodology, impact assessment methodologies, procedure for reviewing environment impact statement.
UNIT IV: Case studies, Economic impact analysis energy production impact analysis, cost benefit analysis, Environmental impact mitigation and control measures.
Reference Books:

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

B.Tech. (ECE) VIII Semester

EUREC 863: IE -II: Web Technology

UNITI: 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
EUREC 864: IE -II: Industrial Electronics

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

Plyphase 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

B.Tech. (ECE) VIII Semester

EUREC 865: IE -II: Computer Aided Design

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.

References: 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
EUREC 866: IE -II: Robotics and Automation

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 Books:

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

B.Tech. (ECE) VIII Semester
EUREC 867: IE -II: Mechatronics

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

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

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

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

UNIT V : Digital logic: Digital logic nuero system

B.Tech. (ECE) VIII Semester
EUREC 868: IE -II: Education Research & Methodologies

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

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

Text Books:

1.C.R.Kothari, research methodology – Methods and techniques, Second edition, Wishwa Prak.

2.Research in Education, Best Pearson.

B.Tech. (ECE) VIII Semester
EUREC 869: IE -II: Professional Ethics

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

EUREC 8610: IE -II: Nanotechnology

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 Books:

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

Reference Books:

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