ACADEMIC REGULATIONS
PROGRAM STRUCTURE
&
DETAILED SYLLABUS

Bachelor of Technology
(Electronics and Communication Engineering)

(Effective for the students admitted from the Academic Year 2011-12)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
'A' Grade Accreditation by NAAC
(Autonomous under JNTU Hyderabad)

Bachelor of Technology (B.Tech) degree of Jawaharlal Nehru Technological University Hyderabad (JNTUH) shall be conferred on a candidate who is admitted to the programme and fulfils all the requirements for the award of the degree.

Academic Regulations GR11 for B.Tech (Regular)

(Effective for the students admitted into I year from the Academic Year 2011-12)

1. Admissions

Admission to the B.Tech programmer shall be made subject to the eligibility and qualifications prescribed by the University from time to time. Admissions shall be made either on the basis of the merit rank obtained by the qualifying candidate at EAMCET conducted by APSCHE or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the Government from time to time.

2. Award of Degree

A student will be declared eligible for the award of the B. Tech. Degree if he/ She fulfils the following academic requirements:

(a) Pursued a course of study for not less than four academic years and not more than eight academic years.

(b) Registered for 200 credits and secured 200 credits. The marks obtained in all 200 credits shall be considered for the calculation of the final percentage of marks.

(c) Students, who fail to fulfil all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.

3. Courses of study

(a) Courses offered
The following courses of study are offered at present for specializations for B. Tech.

(b) There shall be no branch transfer after the completion of admission procedures.

4. Medium of Instruction

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

Branch No.	Branch (Code)
01	Civil Engineering (CE)
02	Electrical and Electronics Engineering (EEE)
03	Mechanical Engineering (ME)
04	Electronics and Communication Engineering (ECE)
05	Computer Science and Engineering (CSE)
11	Biomedical Engineering (BME)
12	Information Technology (IT)
23	Biotechnology Engineering (BT)

5. Course Pattern

(a) Each Academic year of study (I, II, III and IV Years) is divided into two semesters.

(b) Minimum number of instruction days in each semester is 90.

6.Attendance Requirements

(a) A student shall be eligible to appear for the end semester examinations if he/ she acquire a minimum of 75% of attendance in aggregate of all the subjects in the semester.

(b) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted based on medical grounds with sufficient medical proof. A committee headed by Dean (Academic Affairs) shall be the deciding authority for granting the condonation

(c) Students who have been granted condonation shall pay a fee as decided by the Academic Council.

(d) Shortage of Attendance below 65% in aggregate shall in NO case be condoned.

(e) Students whose shortage of attendance is not condoned in any semester are detained and are not eligible to take their end examination of that semester. They may seek re-registration for that semester when offered next with the academic regulations of the batch into which he/she gets re-admitted.

7.Paper setting, Evaluation of Answer Scripts, Marks and Assessment

(a) The following is the maximum marks distribution for the subjects.

	End exams (External)	Internal	Total
Theory	75	25	100
Practical	50	25	75
Drawing	75	25	100
Industrial Mini Project	50	25	75
Comprehensive Viva	100	-	100
Seminar	-	50	50
Project	150	50	200

(b) Paper setting and Evaluation of the Answer Scripts shall be done as per the procedures laid down by the Academic Council from time to time.

(c) For internal evaluation in theory subjects, there shall be 2 mid-term examinations during the semester. Each mid-term examination consists of an objective paper for 10 marks (20 questions) and subjective paper for 15 marks (three out of four questions) with total duration of110 minutes (20 minutes for objective and 90 minutes for subjective paper). Objective paper shall be set with multiple choice questions, true/false, fill-in the blanks, matching type questions, etc. The total marks secured by the student in each mid-term examination for 25 marks is considered and the better of the two mid-term examinations shall be taken as the final marks secured by each candidate as internal marks for the subject.

(d) For internal evaluation in Practical's

(i) Laboratory (including English laboratory): Marks: 25.
Day-to-day work in the laboratory: **15 marks**.

Two internal tests: Each of **10 marks** (conducted by the concerned laboratory Faculty members). The **better of the two** internal tests shall be considered for the award of marks.

The end examination shall be conducted at the end of the semester with the laboratory Faculty as internal examiner and an external examiner as appointed by the Controller of Examinations.

(ii) **Engineering Graphics: 25 marks**
Day-to-day work: 15 marks.

Two internal tests: Each of 10 marks. The better of the two Internal tests shall be considered for the award of marks.

(e) End Semester examinations

This examination shall be set to 75 marks with time duration of 3 hours. The pattern of the examination paper shall be as per the guidelines of the Academic Council.

(f) (i) Industrial Mini Project

Industrial Mini Project is to be taken up in collaboration with Industry during III year. At the end of the semester, Mini Project shall be displayed as a road show at the department level for the benefit of all students and staff. The same is to be evaluated by an internal committee of HOD, Supervisor and senior faculty member for 10 marks. The supervisor continuously assesses the student for 15 marks, ensuring that each student puts in effort equivalent of at least 80 periods. The mini project shall be submitted in a report form and should be presented before a committee consisting of an External Examiner, Head of Department, Supervisor and a senior faculty member. The report along with the presentation for 50 marks.

(ii) Comprehensive Viva

The comprehensive Viva shall be held in IV year II semester. The Viva shall be conducted by a Committee consisting of HOD and two senior faculty members of the department. The student shall be assessed for his/her understanding of various subjects studied during the course of study. The Viva shall be evaluated for 100 marks.

(iii) Seminar

The seminar presentation shall be held in IV year II semester. For the seminar, the student shall collect information on a specialized Topic and prepare a technical report and submit to the department. The student's seminar shall be evaluated by a Committee consisting of HOD, seminar supervisor and a senior faculty member of the department. The student shall be assessed for his/her understanding of the topic, its application and its relation with various subjects studied during the course of study. The seminar shall be evaluated for 50 marks.

(g) Project

Out of 200 marks for the project work, 50 marks shall be for internal evaluation and 150 marks for the End Semester Examination. A Report (in the form required by the Department) shall be submitted by the student before the date announced by the HOD. The End Semester Examination on the project submitted is a Viva voce examination

conducted by the same Committee appointed for Industrial mini project.In addition, the Project supervisor shall also be a member of the Committee. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of the project work shall be done at the end of IV year. The Internal Evaluation shall be based on the two seminars given by each student on the topic of his/ her project.

8. Recounting of marks in the end examination answer books

A student can request for re-counting of his/her answer book on payment of a prescribed fee.

9. Re-evaluation of the answer books

A student can request for re-evaluation of his/her answer book on payment of a prescribed fee.

10. Supplementary examinations

A student who has failed in an End semester examination can appear in a supplementary examination, the schedule of which shall be announced by the Institute separately. The student has to clear all the backlog papers within the stipulated time of eight years.

11. Malpractices in Examinations

Disciplinary action shall be taken in case of malpractices during mid/ End examinations as per the rules framed by the Academic Council.

12. Academic Requirements

The following academic requirements have to be satisfied in addition to t h e attendance requirements mentioned in Para 6.

(a) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or laboratories, if he/ she secures **not less than 35%** (26 out of 75 or 17 out of 50) of marks in the end examination and a **minimum of 40% of marks** in the sum total of the internal evaluation and end examination taken together.

(b) A student shall be promoted from II year to III year; or from III year to IV year only if he/ she fulfils the academic requirement of minimum credits from the following examinations whether the candidate takes the examination or not.

Phase	Minimum Credits	No. of Examinations				
		I-I	I-II	II-I	II-II	III-I
II to III Year	37	2 Regular 1 Supply	1 Regular 1 Supply	1 Regular —	--- ---	--- —
III to IV Year	62	3 Regular 2 Supply	2 Regular 2 Supply	2 Regular 1 Supply	1 Regular 1 Supply	1 Regular

13. Award of Degree or Class

After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B.Tech Degree by JNTUH,he/she shall be placed in one of the following four classes (the marks awarded are from the aggregate marks secured for the 200 credits):

Class Awarded	% of Marks Secured
FIRST CLASS with DISTINCTION	Marks ≥ 70%
FIRST CLASS	60% ≤ Marks < 70%
SECOND CLASS	50% ≤ Marks < 60%
PASS CLASS	40% ≤ Marks < 50%

14. Withholding of results

The result of a student shall be withheld if (i) he/ she is involved in malpractices and is not cleared of the malpractice, (ii) disciplinary proceedings are pending against him/ her, or for any other reason approved by the Academic Council.

15. Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities

Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities shall be considered only on case-to-case basis by the Academic Council of the Institute.

16. Transitory Regulations

Students who have discontinued or have been detained for want of attendance, or who have failed after having undergone the Degree Program, may be considered eligible for readmission to the same or equivalent subjects as and when they are offered.

17. General Rules

(a) The academic regulations should be read as a whole for the purpose of any interpretation.

(b) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.

(c) In case of any error in the above rules and regulations, the decision of the Academic Council is final.

(d) The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College.

Academic Regulations GR11 for B.Tech (Lateral Entry)

(Effective for the students admitted into II year from the Academic Year 2011-12)

1. All regulations as applicable for B.Tech. Four year degree programme (Regular) will hold good for B.Tech. (Lateral Entry Scheme) except for the following rules:

   (a) Pursued a programme of study for not less than three academic years and not more than six academic years (para 2(a)).

   (b) Registered for 150 credits and secured 150 credits. The marks obtained in all 150 credits shall be considered for the calculation of the final percentage of marks(para 2(b)).

   (c) Students, who fail to fulfil all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech programme (para 2(c)).

2. Academic Requirements

A student shall be promoted from III year to IV year only if he/ she fulfils the academic requirement of minimum credits from the following examinations whether the candidate takes the examination or not. (para 12(b).

Phase	Minimum Credits	No. of Examinations		
		II-I	II-II	III-I
III to IV Year	37	2 Regular 1 Supply	1 Regular 1 Supply	1 Regular —

3. Award of Degree or Class

After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B.Tech Degree by JNTUH, he/ she shall be placed in one of the following four classes (the marks awarded are from the aggregate marks secured for the 150 credits)(para 13):

Class Awarded	% of Marks Secured
FIRST CLASS WITH DISTINCTION	Marks ≥ 70%
FIRST CLASS	60% ≤ Marks < 70%
SECOND CLASS	50% ≤ Marks < 60%
PASS CLASS	40% ≤ Marks < 50%

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B.Tech (ECE)PROGRAMME STRUCTURE

I B.Tech (ECE) **I Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
BAS	GR11A1001	Mathematics-I	4	1		4	100	25	75
EAS	GR11A1003	Computer Programming & Data Structures	4	1		4	100	25	75
BAS	GR11A1004	Engineering Physics	3	1		3	100	25	75
EAS	GR11A1005	Basic Electrical & Electronics Engg	3	1		3	100	25	75
HSS	GR11A1002	English	3	1		3	100	25	75
EAS	GR11A1006	Computer Programming &Data Structure Lab			6	3	75	25	50
BAS	GR11A1007	Engineering Physics Lab			3	3	75	25	50
EAS	GR11A1008	Engineering Workshop			3	3	75	25	50
		Total	**17**	**4**	**13**	**25**	**725**	**200**	**525**

I B.Tech (ECE) **II Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
BAS	GR11A1010	Mathematics-II	4	1		4	100	25	75
BAS	GR11A1018	Mathematics-III	4	1		4	100	25	75
BAS	GR11A1011	Engineering Chemistry	3	1		3	100	25	75
EAS	GR11A1009	Environmental Science	3	1		3	100	25	75
EAS	GR11A1012	Engineering Graphics	3		4	3	100	25	75
EAS	GR11A1013	IT Workshop			3	2	75	25	50
BAS	GR11A1014	Engineering Chemistry Lab			3	3	75	25	
HSS	GR11A1015	English Lab			3	3	75	25	50
		Total	**17**	**4**	**13**	**25**	**725**	**200**	**525**

II B.Tech (ECE) — I Semester

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
BAS	GR11A2043	Mathematics-IV	4	1		4	100	25	75
DC	GR11A2066	Signals & Systems	4	1		4	100	25	75
DC	GR11A2044	Probability theory & Stochastic Processes	3	1		3	100	25	75
DC	GR11A2068	Analog Electronics	4	1		4	100	25	75
DC	GR11A2064	Digital Electronics	4	1		4	100	25	75
DC	GR11A2047	Signals Systems & Simulation Lab			3	2	75	25	50
DC	GR11A2045	Analog Electronics Lab			3	2	75	25	50
DC	GR11A2046	Digital Electronics Lab			3	2	75	25	50
		Total	**19**	**5**	**9**	**25**	**725**	**200**	**525**

II B.Tech (ECE) — II Semester

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
BAS	GR11A2051	Networks and Transmission Lines	3	1		4	100	25	75
DC	GR11A2049	Computer Organization and Operating Systems	4	1		3	100	25	75
DC	GR11A2048	Analog Communications	4	1		4	100	25	75
DC	GR11A2050	Micro controllers	3	1		4	100	25	75
DC	GR11A2052	Object Oriented Programming through Java	4	1		4	100	25	75
DC	GR11A2053	Analog CommunicationsLab			3	2	75	25	50
DC	GR11A2054	Micro controllers Lab			3	2	75	25	50
DC	GR11A2055	Object Oriented Programming through Java Lab			3	2	75	25	50
		Total	**18**	**5**	**9**	**25**	**725**	**200**	**525**

III B.Tech (ECE) **I Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
HSS	GR11A2071	MEFA	4	1		4	100	25	75
DC	GR11A3039	Digital Communications	4	2		4	100	25	75
DC	GR11A2017	Electromagnetic Fields	4	1		4	100	25	75
DC	GR11A3095	VLSI Design	4	1		4	100	25	75
DC	GR11A2022	Control Systems	3			3	100	25	75
DC	GR11A3040	Digital CommunicationsLab			3	2	75	25	50
DC	GR11A3096	VLSI Design Lab			3	2	75	25	50
DC	GR11A3001	Advanced Microcontrollers Lab			3	2	75	25	50
		Total	**19**	**5**	**9**	**25**	**725**	**200**	**525**

III B.Tech (ECE) **II Semester**

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
HSS	GR11A3068	Management Science	4	1		4	100	25	75
DC	GR11A3006	Antennas and Wave Propagation	4	1		4	100	25	75
DC	GR11A3047	Embedded Systems	4	1		4	100	25	75
DC	GR11A3041	Digital Signal Processing	4	1		4	100	25	75
IE		**Open Elective**	3	1		3	100	25	75
	GR11A3033	Data Storage Systems							
	GR11A3076	Multimedia Systems							
	GR11A3090	System Modeling and Simulation							
PW	GR11A3064	Industry Oriented Mini Project			3	2	75	25	75
HSS	GR11A2073	Advanced English Communication Skills Lab			3	2	75	25	75
DC	GR11A3042	Digital Signal Processing Lab			3	2	75	25	75
		Total	**19**	**5**	**9**	**25**	**725**	**200**	**525**

IV B.Tech (ECE) — I Semester

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
DC	GR11A4015	Cellular & Mobile Communications	4	1		4	100	25	75
DC	GR11A4064	Microwave Engineering	4	1		4	100	25	75
DC	GR11A4080	Optical Communications	3	1		3	100	25	75
DE		**Elective - 1**	4			4	100	25	75
	GR11A4025	Digital Design through Verilog							
	GR11A4120	Television and Radar Engineering							
	GR11A4118	Telecommunication Switching							
IE	GR11A3080	Power Electronics							
DE		**Elective - 2**	4			4	100	25	75
	GR11A4055	Information Theory and Coding							
	GR11A4130	Wireless Communication Networks							
	GR11A4037	Electronic Measurements & Data							
	GR11A4127	Voice Over IP							
DC	GR11A4001	Advanced Communications Lab			3	2	75	25	75
DC	GR11A4038	Embedded Systems Lab			3	2	75	25	75
DC	GR11A4063	Microwave and Optical Communications Lab			3	2	75	25	75
		Total	**19**	**5**	**9**	**25**	**725**	**200**	**525**

IV B.Tech (ECE) — II Semester

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
DC	GR11A4026	Digital Image Processing	3	1		3	100	25	75
DC		**Elective-3**	3	1		3	100	25	75
	GR11A3027	Computer Networks							
	GR11A4106	Satellite Communication							
	GR11A4109	Semiconductor Memory Design &Testing							
IE	GR11A4126	Virtual Instrumentation							
DC		**Elective-4**	3	1		3	100	25	75
	GR11A4103	RF Circuit Design							
	GR11A4115	Speech Processing							
	GR11A4111	Software Engineering							
	GR11A4028	Digital Signal Processors & Architecture							
DC	GR11A4116	Digital Image Processing Lab			3	2	75	25	50
DC	GR11A4110	Seminar			3	2	50		
DC	GR11A4097	Comprehensive Viva			3	2	100		
PW	GR11A4018	Major Project	15			10	200	40	160
		Total	**19**	**3**	**9**	**25**	**725**		

I-Year

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I B.Tech (ECE) **I Semester**

MATHEMATICS-I

OBJECTIVES: Mathematics is the backbone of all Engineering disciplines. Mathematics - I is common to All Branches except BT. Mathematics-I provides all the basic requirements for application of Mathematics to the Engineers. At the end of the course, the students will be able to apply the concepts of (i) Integration over two and three dimensions, (ii) Vector field sand Vector integration theorems,(iii)Matrix theory, in their fields of study.

L:4,T:1,Credits:4 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I
Matrices: Real matrices - Symmetric, skew-symmetric, orthogonal matrices. Complex matrices: Hermitian, skew-Hermitian, Unitary matrices. Elementary row transformations, rank, echelon form, normal form. Solution of linear systems: Consistency and inconsistency of a system of equations.

Eigen values and eigenvectors: Eigen values and eigen vectors of a matrix and their properties. Modal and spectral matrices. Condition number of a matrix. Cayley- Hamilton theorem (without proof) and its application to find the inverse and powers of a matrix. Diagonalisation of a matrix.

Eigen values and eigen vectors of complex matrices and their properties.

UNIT-II
Linear Transformations and quadratic forms: Linear transformation: Orthogonal transformation. Singular value decomposition of a matrix. Quadratic forms: Definition, positive definite, negative definite, indefinite, semi-definite quadratic forms. Rank, index and signature of aquadratic form. Sylvester law. Reduction of aquadratic form to a canonical form.

UNIT-III
Functions of a single and several variables: Rolle's theorem,Lagrange's mean value theorem, Cauchy's mean value theorem, generalized mean value theorem (all theorems without proof).Radius, center and circle of curvature. Evolutes and envelopes.

Functional dependenceJacobian-Maxima and minima of functions of two variables with and without constraints.

UNIT-IV

Applications of Integration: Representation of curves and surfaces in cartesian, parametricandpolarco-ordinates.Integralrepresentationoflengths, areas, volumes and surface areas of revolution.

Double integrals: Evaluation of double integrals, changing the order of integration, changes of variables, evaluation of plane areas by double integration.

Triple integrals: Evaluation of triple integrals, evaluation using cylindrical and spherical polar co-ordinates, evaluation of the volume of a solid using triple integration.

UNIT-V

Vector Calculus & Tensors: Gradient, divergence, curl and the irrelated properties. Potential function. Line integral-work done-conservative fields-Green's theorem in a plane. Surface integrals-Fluxofa vector valued function-Stoke's and Gauss divergence theorems (statement and their verification)-Introduction to tensors.

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar. Narosa Publishing House.

2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

3. Higher Engineering Mathematics: B.S.Grewal, Khanna Publications.

4. Schaum's outline series on Vector Analysis .Linear Algebra.

Reference Books

1. Schaum's outline series on Linear Algebra.

2. Introduction to Linear Algebra. Gilbert Strang.

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I B.Tech (ECE) **I Semester**

COMPUTER PROGRAMMING AND DATA STRUCTURES

OBJECTIVES: (1) To express algorithms and draw flow charts in a language independent manner, thus exemplifying the professional ethics
(2) To provide the skills necessary for the effective application of computation and computer programming in engineering applications .(3)To understand the concepts of C-programming language such as branching, loops, functions, input/output, arithmetic rules, arrays, pointers and files

L:4,T:1,Credits:4 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I
Introduction to Computers: System Software, Program Developing Steps, Algorithms, Flowcharts. Introduction to C: Structure of C- Program, Variable Names, Data Types, Constants, Operators, Type Conversions, Expressions, Precedence and Order of Evaluation. Managing I/O: Input-Output Statements formatted I/O.

UNIT-II
Control Flow: Statements and Blocks, if, switch statements, Loops: while, do-while, for, break and continue, go to and Labels.

Arrays and Strings: Introduction, One-dimensional arrays, Declaring and initializing Arrays, Multidimensional arrays, Strings, String Handling Functions.

UNIT-III
Functions: Introduction, Function Definition, Function Declaration, Returnvalues and their Types, Function Calls, Categories of Functions, nesting of Functions, Recursion, Passing arrays to Functions, Storage Classes.

Structures: Basics of Structures, Structures to Functions, Arrays of Structures, Structures with in Structures, Arrays with in structures, Unions.

UNIT-IV
Pointers: Pointers and Addresses, Pointers and function Arguments, Pointers and arrays, Address Arithmetic, Character pointers and Functions, Pointer Arrays, Pointers to Structures, Pointers to Pointers, Command Line Arguments.
Files: Introduction, Types of Files, File Access Functions, I/O on Files, Random Access to Files, Error Handling.

UNIT-V

Sorting: Bubble sort, Merge sort, Insertion Sort, Selection Sort, Quick Sort.

Searching: Linear Search, Binary Search.

Introduction to Data Structures: Basics of Linear and Non-Linear Data structures.

Text Books

1. The C Programming Language, BRIANW.KERNIGHAN Dennis M. Ritchie, Second Edition, PHI.

2. Computer Programming and Data structures by E Balaguruswamy, published by McGraw Hill.

Reference Books

1. Let Us C- Yashwanth Kanetkar, 10th Edition, BPB Publications.

2. C & Data structures-P.Padmanabham, B.S. Publications.

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

4. C Programming with problem solving, J.A.Jones & K.Harrow, Dream tech Press.

5. Programming in C- Stephen G. Kochan, III Edition, Pearson Education.

6. Data Structures and Program Design in C,R.Kruse, C.L.Tondo, BPLeung, Shashi M, Second Edition, Pearson Education.

7. Programming in C And Data Structures J.R.Hanly, AshokN Kamthane and AAnanda Rao, Pearson Eduction.

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I B.Tech (ECE) **I Semester**

ENGINEERING PHYSICS

OBJECTIVES: (1)To equip the student the nature and concept of various solids and to gain the knowledge of various properties of materials. (2)To make the student learn the classification of materials based on band theory of solids and the electrical and magnetic properties of various materials.(3)To gain knowledge about the various application of lasers and fiber optics and to gain familiarity with the latest developments and trends in nanotechnology

L:3,T:1, P:0; Credits: 3 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I

Crystal Structure: Cohesive energy of a solid, Calculation of Cohesive Energy of Ionic crystal, Seven Crystal Systems, Atomic Radius, Co-ordination Number and Packing Factor of SC,BCC,FCC.

Defects in Crystals: Point Defects: Vacancies, Substitution, Interstitial, concentration of Frenkel and Schottky Defects; Qualitative treatment of line (Edge and Screw Dislocations) Defects, Burger's Vector, Surface Defects and Volume Defects.

Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, G.P.Thomson Experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time Independent Wave Equation-Physical Significance of the Wave Function-Particle in One Dimensional Potential Box.

UNIT-II

Electron theory of Metals: Classical free electron theory, derivation of ohm's law, Mean free path, relaxation time and drift velocity, failures of quantum free electron theory, Fermi-Dirac distribution, Fermi energy, electron scattering and origin of electrical resistance.

Band Theory of Solids: Electron in a periodic Potential, Bloch Theorem, Kronig-Penny Model (Qualitative Treatment), Origin of Energy Band Formation in Solids, Classification of Materials into Conductors, Semi Conductors &Insulators, Effective Mass of an Electron and Concept of a Hole.

Semiconductor Physics: Fermi Levelin Intrinsic and Extrinsic Semiconductors,

Intrinsic Semiconductors and Carrier Concentration, Extrinsic Semiconductors and Carrier Concentration, Equation of Continuity, Direct &Indirect Band Gap Semiconductors, Hall Effect.

UNIT-III

Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities -Internal Fields in Solids, Clausius -Mossotti Equation, Piezo-electricity, Pyro-electricity and Ferro-electricity.

Magnetic Properties: Permeability, Field Intensity, Magnetic Field Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magnet on, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve, Soft and Hard Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials, Ferrites and their Applications.

UNIT-IV

Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

Fiber Optics: Principle & construction of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers and Refractive Index Profiles, Attenuation in Optical Fibers, Application of Optical Fibers.

UNIT-V

Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Bottom-up Fabrication: Sol-gel, Precipitation, Combustion Methods; Top-down Fabrication: Chemical Vapour Deposition, Physical Vapour Deposition, Carbon nano tubes, Applications.

Text Books

1. Engineering Physics: P.K.Palaniswamy, Scitech Publishers.
2. Engineering Physics: S.O.Pillai, NewageInternational.
3. Applied Physics: T.Bhima Sankaram, GPrasad, B SPublications

Reference Books

1. Solid State Physics: Charles Kittel, Wiley &Sons (Asia) Pvt Ltd.
2. Solid State Physics: S.O.Pillai, Newage International.
3. Optical Electronics: A.JGhatak and K.Thyagarajan, Cambridge University Press.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **I Semester**

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

OBJECTIVES: At the end of the course the student is expected to

1. Know the Fundamental Principles of Electrical and Electronics
2. Understand and apply the Basics of Diodes, Transistors, resistors, Inductors, Capacitor set cand apply them to understand various circuits.

L: 3, T: 1, Credits: 3 **Total Marks: 100(Int: 25, Ext: 75)**

UNIT-I
Electrical and Single Phase AC Circuits

Electrical Circuits: RLC Parameters, Voltage and Current Independent and Dependent Sources, Source Transformation-V-I relationship for Passive elements, Kirchoff's Laws, Network reduction techniques - series, parallel, series parallel, star-to-delta, delta-to-star transformation, Nodal Analysis.

Single Phase AC Circuits: R.M.S. and Average values, Form Factor, steady state analysis of series, Parallel and Series parallel Combinations of R, L and C with Sinusoidal excitation, concept of reactance, Impedance, Susceptance and Admittance - phase and phase difference, Concept of Power Factor, j-notation, complex and Polar form so fre presentation.

UNIT-II
Resonance and Network Theorems

Resonance-series resonance and parallel resonance circuits, concept of bandwidth and Q factor, Locus Diagrams for RL, RC and RLC Combinations for Various Parameters.

Network Theorems-Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity, Tellegen's, Millman's and Compensation theorems for DC and AC excitations.

UNIT-III
P-N Junction Diode &Diode Circuits

P-N Junction Diode: Diode equation, Energy Band diagram, Volt-Ampere characteristic, Temperature dependence,Ideal versus practical,Static and dynamicresistances, Equivalent circuit,Load line analysis DiffusionandTransition Capacitances.

Rectifiers and Filters: The P-Njunctionasarectifier- AHalfWaveRectifier, RippleFactor, Full Wave Rectifier, Bridge Rectifier,Harmonic componentsin Rectifier Circuits,FiltersInductor Filters,Capacitor Filters,L-sectionFilters,-Section Filters.

UNIT-IV

BipolarJunctionTransistor

Bipolar Junction Transistor (BJT): Construction, Principle of Operation, Symbol, Amplifying Action, Common Emitter, Common Baseand Common Collector configurations.

TransistorBiasing AndStabilization: Operating point, DC&ACloadlines, Biasing-FixedBias, Emitter Feedback Bias, Collector to Emitter feedback bias,Voltage divider bias, Bias stability, Stabilization against variations inV Bias Compensation using Diodes and Transistors.
And β,

Transistor Configurations: BJT modeling, Hybrid model, Determination of h-parametersfromtransistorcharacteristics, Analysis of CE,CB and CC configurations usingh-parameters, ComparisonofCE,CBandCCconfigurations.

UNIT-V

JunctionFieldEffectTransistor&SpecialPurposeDevices

JunctionFieldEffect Transistor: Construction, Principle of Operation, Symbol, Pinch-OffVoltage, Volt-Ampere Characteristic, Comparison of BJT and FET, Small Signal Model, Biasing FET.

Special Purpose Devices: Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Use of Zener diode as simple regulator Principle of operation and Characteristics of Tunnel Diode(with the help of Energy band diagram)and Varactor Diode,Principle of Operation of SCR.

Text Books

1. Electronic Devices and Circuits R.L. Boylestad and Louis Nashelsky, PEI/ PHI, 9th Ed, 2006.

2. Millman's Electronic Devices and CircuitsJ.Millman and C.C.Halkias, Satyabratajit, TMH, 2/e, 1998.

3. Engineering Circuit Analysis-byWilliam Hayt and JackE.Kemmerly, Mc Graw Hill Company, 6thedition.

Reference Books

1. Introduction to Electronic Devices and Circuits-RoberT.Paynter, Pearson Education.

2. Electroni Devices and Circuits- K.Lal Kishore, B.S.Publications, 2nd Edition, 2005.

3. Electronic Devices and CircuitsAnil K.Maini, Varsha AgarwalWiley India Pvt. Ltd. 1/e 2009.

4. Linear circuit analysis (time domain phasor and Laplace transform approaches)-2nd edition by Raymond A.DeCarlo and Pen-Min-Lin, Oxford University Press-2004.

5. Network Theory byN.C.Jagan &C.Lakshminarayana, B.S.Publications.

6. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **I Semester**

ENGLISH

L:3,T:1,P:0;Credits:3 **Total Marks:100(Int:25,Ext:75)**

OBJECTIVES:(1)to improve English language proficiency of the students with an emphasis on LSRW skills (2) to equip the students study the academic subjects with better perspective through the theoretical and practical components of the designedsyllabus

UNIT-I

1. Sir C.V.Raman: Subhasree Desikhan, from“EnjoyingEverydayEnglish”.
2. Mother Teresa: From, “InspiringSpeechesandLives”.

UNIT-II

1. The Connoisseur: NergisDalal, from“Enjoying Everyday English”.
2. SamPitroda: From“InspiringSpeechesandLives”.

UNIT-III

1. The Cuddlore Experience: Anu George, from “Enjoying Everyday English”.
2. Amartya Kumar Sen: From “Inspiring Speeches and Lives”.

UNIT-IV

1. Bubbling WellRoad: Rudyard Kipling, from“EnjoyingEverydayEnglish”.
2. IHaveaDream: Martin Luther KingJr., from“InspiringSpeechesandLives”.

UNIT-V

Exerciseson

1. Reading and Writing Skills
2. ReadingComprehension

3. Situational Dialogues
4. Letter Writing
5. Essay Writing

Practice exercises on remedial grammar covering

1. Common Errors in English
2. Subject-VerbAgreement
3. Use of Articles
4. Use of Prepositions
5. Tense and Aspect

Vocabulary Development

1. Synonyms & Antonyms
2. One-Word Substitutes
3. Prefixes & Suffixes
4. Idioms and Phrases
5. Pairs of Words Often Confused

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **I Semester**

COMPUTER PROGRAMMING AND DATA STRUCTURE LAB

OBJECTIVES: (1)To introduce the fundamentals of C programming language and develop the skills for solving problems (2) To develop the proficiency in writing programs in a procedural programming language(3) To use the concepts of searching and sorting for solving real-time problems

L:0,T:0,P:6;Credits:3 **TotalMarks:75(Int:25,Ext:50)**

Task-I

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

b) A Fibonacci sequence is defined as follows: the first and second terms inthe sequence are 0and1.Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

c) Write a C program to generate all the prime numbers between1and n,where n is a value supplied by the user.

Task-II

a) Write a C program to calculate the following Sum: Sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!

b) Write a C program to find the roots of aquadratic equation using if-else.

Task-III

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

i) To find the factorial of a given integer.

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

Task-IV

a) The total distance travelled by a vehicle in't'seconds is given by distance S=u*t+1/2at2 where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/ sec2). Write a C program to find the distance travelled by a vehicle at

regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations fordifferentvaluesof'u'and'a'.

b) Write a C program,which takes two integer operands and one operator form the user, performs the operation andthen prints the result. (Consider the operators +,-,*,/,% and use Switch Statement)

Task-V

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

b) Write a C program that uses functions to perform the following:

   i) Addition of Two Matrices

   ii) Multiplication of Two Matrices

Task-VI

a) Write a C program that uses functions to perform the following operations:

   i) To insert a sub-string into given main string to a given position.

   ii) To delete n Characters from a given position in a given string.

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

Task-VII

a) Write a C program that displays the position or index in the string S where the string T begins, or-1if S doesn't containT.

b) Writea C program to count the lines, words and characters in a given text.

Task-VIII

a) Write a C program to generate Pascal's triangle.

b) Write a C program to construct a pyramid of numbers.

Task-IX

a) Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:1+x+x2+x3+……+xn Forexample: if n is 3 and x is 5, then the program computes1+5+25+125. Print x, n, the sum performerr or checking.For example, the formula does not make sense for

negative exponents (), if n is less than 0. Have your program to print an error message find"0, without computing the sum.

b) Write a C program that uses functions to perform the following operations:

i) Addition of two complex numbers

ii) Multiplication of two complex numbers

(**Note:** represent complex number using a structure.)

Task-X

a) Write a C Program to display the contents of a file.

b) Write a C Program merging of two files in a single file. c) Write a C Program to append data into a file.

Task-XI

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

b) Write a C program to reverse the first n characters in a file.

(Note:The file name and n are specified on the command line.)

Task-XII

a) Write a C Program to Search for a given element using Linear & Binary Search Techniques.

b) Write a C Program to Sort a given list of integers using Bubble Sort Technique.

Task-XIII

a) Write a C Program to Sort a given list of integers using Merge Sort Technique.

b) Write a C Program to Sort a given list of integers using Insertion Sort Technique.

Task-XIV

a) Write a C Program to Sort a given list of integers using Quick Sort Technique.

b) Write a C Program to Sort a given list of integers using Selection Sort Technique.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **I Semester**

ENGINEERIN GPHYSICS LABORATORY

OBJECTIVES: (1)To enable the student to draw the relevance between the theoretical knowledge and to imply it in a practical manner with respect to analyze various electronic circuits and its components.(2) To analyze the behavior and characteristics of various materials for its optimum utilization.

L:0,T:0,P:3;Credits:3 **TotalMarks:75(Int:25,Ext:50)**

LISTOFEXPERIMENTS

1. Measurements using Multimeter.
2. Measurement of voltage and Frequency usingCRO.
3. B-H curve.
4. Determination of Dielectric constant.
5. Energy gap of a semiconductor
6. Study of magnetic field along the axis of a circular coil.
7. Study of Hall Voltage
8. Determination of carrier concentration and carrier mobility of a semiconductor.
9. Numerical Aperture of optical fiber.
10. Bending losses in optical fiber.
11. Air gap losses in optical fiber
12. Characteristics of LASER diode

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **I Semester**

ENGINEERING WORKSHOP

OBJECTIVES: At the end of the course the student is expected to

1. Know the various trades applicable to industries.
2. Hands on experience for common trades.

L:0,T:0,P:3;Credits:2 **TotalMarks:75(Int:25,Ext:50)**

TRADESFORPRACTICE

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. House-Wiring

DEMONSTRATION

5. BlackSmithy
6. Foundry
7. Welding
8. Plumbing
9. Powertools

TextBooks

1. Work Shop Manual: P.Kannaiah, K.I.Narayana,Scitech Publishers.
2. Work Shop Manual: VenkatReddy.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

MATHEMATICS-II

OBJECTIVES: Mathematics is the backbone of all Engineering disciplines. Mathematics-II is common to All Branches except BT. At the end of the course; the students will be able to

(i) Understand and apply the methods of solving the differential equations directly or using Laplace transforms,

(ii) Solve linear and some nonlinear partial differential equations,

(iii) Understand the basic of Fourier series and its representation.

L:4,T:1,Credits:4 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I
First order ordinary differential equations: Formation of ODE. Solution of separable, homogeneous, exact, linear and Bernoulli linear equations

Applications to Newton's law of cooling, Law of natural growth and decay, orthogonal trajectories and geometrical applications.

UNIT-II
Second and higher order ODE with constant coefficients: Solution of second and higher order linear homogeneous differential equations. Non- homogeneous differential equations with RHS term of the type F(x)=eax,sinax,cosax,xn,eaxV(x),xnV(x). Method of variation of parameters-Applications to bending of beams, electrical circuits, simple harmonic motion.

UNIT-III
Laplace transform and its application to ordinary differential equations: Laplace transform of standard functions-inverse Laplace transform-First shifting theorem, Transform of derivatives and integrals-Unit step function-Second shifting theorem-Differentiation and integration of transforms-Dirac's delta function.

Convolution theorem-Periodic function- Application of Laplace transforms to ordinary differential equations

UNIT-IV

Fourierseries: Fourier series on the interval (-π,π):Determination of coefficients, Fourier series of even and odd functions,convergence.Fourier series on an arbitrary interval.Halfrange Fourier cosine and sine series using even and odd extensions.

UNIT-V

Partial differential equations: Formation of partial differential equations by eliminating arbitrary constantsorarbitraryfunctions.Solutionsoffirstorderlinear (Lagrange) equation. Solution of nonlinear first order equations (four standard types). Solution using separation of variables. Application to heat equation (one dimension), wave equation (one dimension) and Laplace equation (two dimensions).

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar.Narosa Publishing House.

2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

3. Higher Engineering Mathematics: B.S.Grewal, Khanna Publications.

Reference Books

1. Schaum'soutlineserieson Vector Analysis; Laplace Transforms; Differential Equations.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

MATHEMATICS III

OBJECTIVES: Mathematics is the backbone of all Engineering disciplines. MathematicsIII is common to All Branches except BT. The course is Numerical solution of problems in various fields. At the end of the course, the students will be able to solve numerically various problems in(i) nonlinear algebraic equations, (ii) systems of linear algebraic equations, (iii) integration, and (iv) initial and boundary value problems in ODE.

L:4,T:1,Credits:4 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I
Solution of a non-linear equation & Solution of linear systems: Solution of non- linear equations: Bisection method, Method of false position, Iteration method and Newton-Raphson method.

Solution of linear systems: Gauss elimination, Gauss elimination with partial pivoting, Gauss-Jordan method, Jacobi and Gauss-Seidel iterative methods. Convergence of iterative methods (with out proof).

UNIT-II
Interpolation1(Interpolation for uniform data): Finite differencesForward, backward and central differences. Relationship between operators.Differences of a polynomial.Newton's forward and backward difference formulas.

UNIT-III
Interpolation2(Interpolation for non-uniform data &Splines): Lagrange and Newton's divided difference formulas for unevenly spaced data.Splines: Cubic splines and B-splines.

UNIT -IV
Curve fitting (Method of least squares),Numerical differentiation and numerical integration: Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.

Numerical differentiation using the Newton's forward and backward difference formulas.
Numerical integration: Trapezoidal and Simpson's1/3rd rules. Gauss-Legendre one point, two point and three point rules for integration.

UNIT-V

Numerical solution of Initial Value Problems and Boundary Value problems in ODE: Numerical solution of Initial Value Problems: Picard's method of successive approximation. Solution by Taylor series method,Euler method, Runge-Kutta methods of second and fourth orders.Predictor-corrector methods-Combinations of first and second order P-Cmethods.

Numerical solution of Boundary Value Problems in ODE: Finite difference methods for solving second order linear ODE.

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar.Narosa Publishing House.

2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

3. Higher Engineering Mathematics: B.S.Grewal, Khanna Publications.

4. Mathematical Methods: S.R.K.Iyengar and R.K.Jain, Narosa Publishing House.

Reference Books

1. NumericalMethodsforScientific&EngineeringComputation: M.K.Jain, S.R.K. I yengar, and R.K. Jain. New Age International Publications.

2. Introductory Methods of NumericalAnalysis. S.S. Sastry, Prentice Hall.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

ENGINEERING CHEMISTRY

OBJECTIVES: At end of the course, the student should be able to understand the

1. Role of polymers and nano materials in engineering applications.
2. Role of chemistry (conducting polymers) in the energy production.
3. Material behavior for application in environmental applications.
4. Basic concepts of application of materials in all fields of engineering.

L:3,T:1,P:0,Credits:3 **TotalMarks:100 (Int:25,Ext:75)**

UNIT-I

Electrochemistry: Concept of Conductance- Specific, Equivalent and molar conductance and ionic conductance, electrolyticcells- Galvanic Cells, Potentiometric titrations - strong acid vs strong base, electrochemical series ConcentrationCells

Corrosion causes and effects of corrosion, theories of corrosion Chemical, Electrochemical corrosion, Factors affecting corrosion, control methods Cathodic protection, sacrificialanode, impressed current cathode. Surface coating smethods of application on metals- hot dipping, galvanizing, tinning, cladding, electroplating, Paints constituents and their functions.

UNIT-II

Water Technology: Introduction, Hardness: Causes, expression of hardnessunits
types of hardness, estimation of temporary & permanent hardness of water complexometric method , Boiler troubles Scale &sludge formation, caustic enbrittlement, priming & foaming, Softening of water - Internal and external treatment , Ion exchange process and Numerical problems, Desalination of brackish water-Reverse osmosis, electrodialysis.

UNIT-III

Polymer Technology: Types of Polymerization, Plastics: Thermoplastic resins& Thermoset resins.Compounding & fabrication of plastics, preparation, properties and engineering applications of polyethylene, PVC, polystyrene, Teflon, Bakelite,

Nylon.Conducting Polymers: Poly acetylene, polyaniline, applications. Liquid Crystalpolymers: Characteristics and uses, RubberNatural rubber, vulcanization. Elastomers Butyl rubber, Thiokol rubbers, Fiber reinforced plastics (FRP), Biodegradable polymers.

UNIT-IV

Energy sources: Concept and classification of fuels - solid, liquid, gaseous, fuels, Solid fuels coal analysis proximate and ultimate analysis and their significance, Liquid fuelspetroleum, refining of petroleum definition of cracking and its significance, knocking-octane number, cetane number, synthetic petrol Bergius and FischerTropsech's process method, Gaseous fuels natural gas, LPG, CNG, Calorific value of fuel HCV, LCV, Introduction to biodiesel, problems.

UNIT-V

Engineering Materials

Cement: Composition and manufacture of Portland cement, setting & hardening of cement.

Lubricants: Definition and classification, theories of lubricants, properties- Cloud point, pour point, flash and fire point, Viscosity.

Refractories: Classification, Characteristics of a good refractory and failure mechanism of refractory materials.

Batteries: Definition and classification, Primary - dry cell, Secondary cells - lead-Acid cell, Ni-Cd cell, and Lithium cells , Fuel cells Hydrogen Oxygen fuel cells and uses.NanomaterialsIntroduction,general methods of preparation, applications.

Text Books

1. Text book of Engineering Chemistry: Y.Bharathi kumari and C.Jyotsna, VGS Booklinks, Vizayawada, A.P, Edition June2009.
2. Text Book of Engineering Chemistry: C.P.Murthy, C.V.Agarwal, and A. Naidu, B.S.Publications, Hyd.
3. Text book of Engineering Chemistry by P.CJain and Monika Jain, Dhanpat Rai Publishing Company (p) Ltd, K.K. Group, New Delhi (2006)

Reference Books

1. Chemistry of Engineering Materials: R.PManiand K.N.Mishra, CENGAGE Learning
2. Text of Engineering Chemistry: S.S.Dara & Mukkati S.Chand &Co, New Delhi (2006)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

ENVIRONMENTAL SCIENCE

L:3,T:1,Credits:3 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I
IntroductiontoEnvironment,EcologyandEcosystems: Definition,Importance and Scope of Environmental Studies, Public Awareness and Participation. Ecology, Concept of Ecosystem, Classification of Ecosystem, Structure, Components and Function of Ecosystem.Typical Ecosystem, Food Chain,Food Web.Bio diversity- Types and values.

UNIT-II
Natural Resources: Definition, Occurrence, Classification of resources, Important natural resources for human society, Utilization-positive and negative effects of water resources, Mineral resources, Forest resources, Energy resources, Land resources.Role of individuals inconservation of important natural resources.

UNIT-III
Environmental Pollution: Definition,Classification of Pollution, Type of Pollution and Pollutants.Causes,effects and control ofAir Pollution,Water Pollution,Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution and Nuclear Pollution.

UNIT-IV
Environmental Problems and Management Policies: Natural Disasters-Types, causes and effects; Global warming, Climate change-ElNino-LaNina, Ozone layer- location, role and degradation; deforestation and desertification.

Management: Technological solutions, Preventive methods, control techniques; Green Belt development, Rain water harvesting, Renewable and alternate resources.

UNIT-V
National Policy on Environment protection and Sustainability: Air (Pollution and prevention) act 1981;Water (Pollution and prevention) Act 1974; Pollution Act 1977; Forest Conservation Act; Wild life Protection Act;Municipal solid waste management and handling Act; Biomedical waste management and handling Act; Hazardous waste management and handling rules. Role of IT in

environment, environmental ethics,environmental economics.

Sustainable development: Cause and Threats to sustainability; strategies for achieving sustainable development; Concept of Green building and Clean Development Mechanism(CDM).

Text Books

1. Text book of Environmental Studies, Erach BArucha.UniversityPress

2. Text book of Environmental Science and Technology by M.Anji Reddy 2007

Reference Book

1. Biotechnology & Environmental Chemistry.Surinder Jeswal & Anupama Deswal, Dhanpat Rai & Co Pvt. Ltd.

2. AText Book of Environmental Science.Aravind Kumar. APHPublishing Corporation.

3. Glimpses of Environment.Dr.KVSG.MuraliKrishna.Environmental Protection Society.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

ENGINEERING GRAPHICS

OBJECTIVES: At the end of the course the student is expected to

1. Learn the fundamental concepts of EngineeringGraphics.
2. Drafting Practice for Geometrical Drawing and Projections.
3 Introductionto Auto CAD.

L:3,T:0,P:4:Credits:3 **TotalMarks:100(Int:25,Ext:75)**

UNIT-I
Introduction to Engineering Drawing: Principles of Engineering Graphics and their significance Drawing Instruments and their Use Conventions in Drawing Lettering BIS Conventions. Curves used in Engineering Practice & their

Constructions:(a) Conic Sections, (b) Cycloid, Epicycloid and Hypocycloid, (c) Involutes.(d) Scales: Different types of scales. Plain Scale, Diagonal Scale &Vernier Scale.

UNIT-II
Drawing of Projections or Views of Orthographic Projection in First Angle Projection only:

Principles of Orthographic Projections Conventions First and Third Angle Projections. Projections of Points and Lines inclined to planes, True lengths, traces. Projections of regular Planes: inclined to both planes.

UNIT-III
Projections of Solids: Projections of Regular Solid sinclined to both planes.

DevelopmentofSurfaces: Development of Surfaces of Right Regular Solids Prisms, Cylinder, Pyramid Cone and their parts.

UNIT-IV
Isometric Projections: Principles of Isometric Projection Isometric Scale Isometric Views Conventions Isometric Views of Lines, Plane Figures, Simple and Compound Solids Isometric Projection of objects having non- isometric lines.Isometric Projection of Spherical Parts.

Transformation of Projections:Conversion of Isometric Views to Orthographic ViewsConventions.

UNIT-V

Introduction to Computer Aided Drafting Generation of points, lines, curves, polygons, simple solids and their dimensioning.

Text Books

1. Engineering Drawing, N.D. Bhat, Charotar.

2. Engineering graphics withAutoCAD-R.B.Choudary,Anuradha Publishers.

Referecnce Books

1. Engineering Drawing and Graphics, Venugopal, Newage.

2. Engineering Drawing-Johle, Tata MacgrawHill.

3. Computer Aided Engineering Drawing-Trymbaka Murthy-I.K.International.

4. Engineering Drawing, Narayana and Kannaiah,Scietech publishers.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

IT WORKSHOP

L: 0, T: 0, P: 3 **Total Marks: 75(Int: 25, Ext: 50)**

PC Hardware: Introduces the students to a personal computer and its basic Peripherals, the process of assembling a personal computer, installation of system Software like MS Windows, Linux and the required device drivers.In addition hardware and software level trouble shooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wher ever possible.

Internet & World Wide Web module introduces the different ways of looking the PC onto the internet from home and work place and effectively usage of the internet. Usage of web browsers, email, news groups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced. Productivity tools module would enable the students in crafting professional word documents, spread sheets and slide presentations.

PC Hardware

Task-1: Identify the peripherals of a computer, componentsina CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task-2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows he process of assembling a PC. A video would be given as part of the course content.

Task-3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task-4: Every student should install Linux on the computer.Thiscomputer should have windows installed. The system should be configured as

dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task-5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Task-6: Software Trouble shooting: Students have to be given a malfunctioning CP Udue to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet&WorldWideWeb

Task-7: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet.Inthe process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task-8: Web Browsers, Surfing the Web: Students customize their web browsers with theLAN proxy settings, bookmarks, search tool bars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task-9: Search Engines & Netiquette: Students should know what search engines are and how to use this arch engines.A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task-10: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet.They need tofirst install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and / or worms.

Productivity Tools

Task-11: introducing features of professional word documents like opening, closing, editing, saving, printing, and text formatting.

Task-12: students would be exposed to create word documents with images, tables, formulas, and with additional word processing features.

Task-13: introducing features of professional spread sheets like opening, closing, editing, saving, printing, and text formatting.

Task-14: students would be exposed to compile spread sheets using formulas, different number formats, text formats and conditional formatting.

Task-15: introducing features of professional slide presentations like opening, closing, editing, saving, printing, and text formatting.

Task-16: students would be exposed to create slide presentations with tables, different views of slide presentations, master slides, and custom animations.

Reference Books

1. Introduction to Information Technology, ITL Education Solutions Limited, Pearson Education.

2. IntroductiontoComputers, PeterNorton, 6/eMcGrawHil.l

3. Upgrading and Repairing, PC's18th e, Scott MullerQUE, Pearson Education.

4. Comdex Information Technology Course tool kit Vikas Gupta,WILEY Dreamtech.

5. IT Essentials PC Hardware and Software Companion Guide, Third Edition by David Anfinson and Ken Quamme- CISCO Press, Pearson Education.

6. PCHardwareandA+HandbookKate J. Chase PHI (Microsoft).

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

ENGINEERING CHEMISTRY LABORATORY

OBJECTIVES: At end of the course, the student should be able to understand

1. The characteristics and preparation of rubber.
2. The characteristics and nature of lubricating oils.
3. The hard water analysis process.
4. Basic concepts of analysis and application of materials in all fieldsof engineering.

L:0,T:0,P:3Credits:3 **Total Marks: 75 (Int:25,Ext:50)**

LIST OF EXPERIMENTS

1. **Conductometry:** Conductometric titrations of strong acid verses strong base.
2. **Potentiometry:** Potentiometric titration of strong acid verses strongbase.
3. **Lubricants:**Determination of viscosity of a sample oil by Redwood viscometerI.
4. **Lubricants:** Determination of surface tension of lubricants by stalagmometer.
5. **Organic preparations:** Preparation of Aspirin and Thiokol rubber.
6. **Complexometry:** Estimation of hardness of water by using standard EDTA Solution.
7. **Complexometry:** Estimation of copper by using standard EDTAsolution.
8. **Permanganometry:** Estimation of ferrousiron by using standard potassium permanganate solution.
9. **Dichrometry:** Estimation of ferriciron by using standard potassium dichromate solution.
10. **Colorimetry:** Estimation of ferrous ironincement by using colorimeter.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (ECE) **II Semester**

ENGLISH LAB

OBJECTIVES: To expose the students to a variety of self-instructional,learner-friendly modes of language learning.

(i) To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such GRE, TOEFL, GMAT etc.

(ii) To enable them better pronunciation through stress on word accent, into nation, and rhythm.

(iii) To train students to use language effectively to face interviews, group discussions, public speaking etc.

(iv) To initiate them into greater use of the computer in resume preparation, report writing, format-makingetc.

L:0,T:0,P:3,C:2 **TotalMarks:75(Int:25,Ext:50)**

SYLLABUS: The following course content is prescribed for the English Language.

Laboratory sessions:

(i) Introduction to the sounds of English-Vowels, Diphthongs & Consonants.

(ii) Situational Dialogues/Role-play.

(iii) 'Just A Minute' Sessions (JAM).

(iv) Describing Objects /Situations/People.

(v) Information Transfer. (vi) Debate.

(vii) Telephone Skills. (Viii) Giving Directions.

Suggested Software:

(i) Cambridge Advanced Learners'English Dictionary with CD.

(ii) The Rosetta Stone English Library.

(iii) Clarity Pronunciation Power-Part 1.

(iv) Mastering English in Vocabulary, Grammar, Spelling, and Composition.

(v) Dorling Kindersley series of Grammar, Punctuation, Compositionetc.

(vi) Language in use, Foundation Books Pvt Ltd withCD.

(vii) Oxford Advanced Learner's Compass, 7th Edition.

(viii) Learning to speak English-4CDs.

(ix) VocabularyinUse, Michael McCarthy, Felicity O'Den, Cambridge.

(x) Murphy's English Grammar, Cambridge with CD.

(xi) English in Mind, Herbert Puchta and JeffStranks with Meredith Levy, Cambridge

Books (to be located with in the lab in addition to the CDS of the text book which are loaded on the systems):

1. English Language Communication SkillsA Reader cum Lab Manual Course content and Practice (withCD) Dr.A.Rama Krishna Rao, Dr. G.Natanam, Prof. S.A Sankaranarayanan.Publishers: Anuradha Publications, Chennai.

2. A Handbook of English for professionals-Fourth Edition Dr.P.Eliah, BS Publications.

3. Better English Pronunciation, JDO'Connor, Cambridge UniversityPress.

4. A Foundation English Course for under graduates (Practice exercises on skills) Paul Gunashekar, Shyamala Kumar Das Sachil Mahadevan, Oxford University Press.

5. Improve Your Writing, V.N.Arora & Lakshmi Chandra,Oxford University Press.

6. Speaking English Effectively, Krihna Mohan & N.P.Singh, Macmillian Publishers.

7. English Conversation for Indian Students, Y.V.Yardi, Orient Longman.

8. The Written Word, BVandana R.Singh, Oxford University Press.

9. Strengthen Your Writing, V.R.Narayanaswami, Orient Longman Publishers.
10. Ahand book of Standard English and Indian Usage, J.Sethi Prentice Hall.
11. Essential Telephoning in English, Tony Garside and Barbara Garside, Cambridge press.
12. English Conversation Practice Spoken English, GrantTaylor, Tata McGraw Hill
13. English Conversation Practice Spoken English, JayashreeBalan,Vijay NicoleImprints Pvt.Ltd
14. How to Prepare for Group Discussion and Interview, V.SasiKumar, PV Dhamija, Tata McGraw Hill

II-Year

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

MATHEMATICS-IV

UNIT-I
Special Functions I: Introduction to series solution of differential equations.Beta and Gamma functions - Their properties - Evaluation of improper integrals in terms of Beta and Gamma functions. Legendre polynomials (as solution of second order differential equation)-properties-Rodrigue's formula-recurrence relations-Orthogonality-Fourier-Legendre series.

UNIT-II
Special Functions II: Bessel Functions-properties-recurrence relations-orthogonality. Chebyshev polynomials (as solution of second order differential equation)-properties-recurrence relations-orthogonality.

Function sofa Complex variable: Continuity-differentiability-Analyticity-Cauchy-Riemannequations-Maxima- minima principle-Harmonic and conjugate harmonic functions-Milne-Thompson method.Elementary functions.General powerzn Principal value. Log arithmic function.

UNIT-III
Complex integration: Line integral-evaluation along a path-Cauchy's integral theorem- Cauchy's integral formula-Generalized integral formula.

UNIT-IV
Complex power series: Radius of convergence-Expansion in Taylor series, Maclaurin's series-Laurent series.

Singular points and Residues: Singular points - isolated singular point - pole of orderm - essential singularity. (Distinction between real analyticity and complex analyticity).Residue Evaluation of residue by formula and by Laurent seriesResidue theorem.

UNIT-V
Contour integration Evaluation of realintegrals of the types:
(a) Improper integrals , (b) , (c) , and integrals by indentation.

Conformal Mapping: Transformations,(apositiveinteger),rotation,inversion and bilinear transformation-fixed point-cross ratio-invariance of circles and cross ratiodetermination of bilinear transformation mapping of 3 given points.

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar.Narosa Publishing House.

2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

Reference Books

1. Schaum's outline series on ComplexVariables.

2. Higher Engineering Mathematics:B.S.Grewal, Khanna Publications.

3. Differential Equation and Applications (with historical notes)G.F.Simmons (TMH)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

SIGNALS AND SYSTEMS

UNIT-I
Introduction to Continuous-time Signals and Systems: Typical signals (impulse, step, ramp, sinusoid, exponential, signum, sinc); Time-domain scaling, shifting, and folding; CT signal characteristics (periodicity, frequency, deterministic, random, symmetry, energy and power); Properties of continuous-time systems (linearity, time in variance, causality and stability). Analogy between vectors and signals; Orthogonal signal space; Signal approximation using orthogonal functions; Mean square error; Closed or complete set of orthogonal functions; Orthogonality in complex functions.

UNIT-II
Fourier Series, Fourier Transform, and Laplace Transform: Representation of continuous-time periodic signals by Fourier series; Dirichlet's conditions; Properties of Fourier series, Parseval's theorem; Trigonometric and Exponential Fourier series; Complex Fourier spectrum; Fourier transform via Fourier series; Fourier transform of a periodic and periodic signals; Converegence of F-transform; Properties of Fourier transforms, Parseval's theorem; Fourier transforms involving impulse function and Signum function; Introduction to Hilbert Transform (brief); Definition of two-&one-sided Laplace transform, Region of convergence (ROC) (brief);Relation between LT and FT.

UNIT-III
Signal Transmission through Linear Systems: Continuous-time Linear Time-Invariant system, differential equations; Transform and state-variable representation; Impulse response, Convolution; Transfer function, frequency response; Ideal vs. realizable LPF, HPF and BPF characteristics; Signal band width, system band width, rise-time, gain-band width; Distortion; Causality and Paley-Wiener criterion for physical realization.

UNIT-IV
Sampling & Discrete-time Signals: Sampling theorem Graphical and analytical proof for Band Limited Signals; Impulse-train sampling; Natural and Flat-top Sampling; Reconstruction of signal from its samples; Under-sampling and Aliasing; Band-pass Sampling Theorem; DT signal characteristics (periodicity, frequency, deterministic, random, symmetry, energy and power).

UNIT-V

The z-Transform: Discrete time signal representation using complex exponential and sinusoidal components; Z-Transform of a discrete sequence; Region of convergence of z-Transform,Constraints on ROC for various classes of signals; Relationship between z-Transform and DTFT(Fourier spectrum);Transfer function of aLTIsystem(No difference equations);Properties of z-Transform and Parseval's theorem;Inversez-Transform by Partial Fractions(simple poles)only.

Text Books

1. B.P.Lathi, Signals, Systems and Communications-B.S.Publications, 2003

2. AllanV.Oppenheim, Allan S.Willsky and S.Hamid Nawab, “Signals and Systems”, Second Edition, PHI Learning, NewDelhi, 2007.

Reference Books

1. Simon Haykins and BarryVanVeen, “Signals and Systems”, Second Edition, John Wiley and Sons, 2002.

2. DouglasK.Lindner,“Signals and Systems”, McGraw-Hill International Edition, 1999.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

PROBABILITY THEORY AND STOCHASTIC PROCESSES

UNIT-I

Probability & Random Variable: Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Baye's Theorem, Independent Events: The Random Variable: Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian Distribution.

UNIT-II

Operations on Single & Multiple Random Variables Expectations: Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Non-monotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable. Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density-Point Conditioning, Conditional Distribution and Density-Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables,Central Limit Theorem, (Proof not expected).Unequal Distribution, Equal Distributions. Expected Value of a Function of RandomVariables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions.

UNIT-III

Random Processes -Temporal Characteristics: The Random Process Concept, Classification of Processes, Deterministic and Non-deterministic Processes, Distribution and Density Functions, concept of Stationarily and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide- Sense Stationarity, (N-Order) and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Auto correlation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process. Random Signal Response of Linear

Systems: System Response Convolution, Mean and Mean-squared Value of System Response, auto correlation Function of Response, Cross-Correlation Functions of Input and Output.

UNIT-IV

Random Processes - Spectral Characteristics: The Power Spectrum: Properties, Relationship between Power Spectrum and Auto correlation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function. Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and Output.

UNIT-V

Modelling of Noise Sources & Information Theory : Resistive (Thermal) Noise Source, Arbitrary Noise Sources, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks Narrow Band noise, Quadrature representation of narrow band noise & its properties. Entropy, Information rate, Source coding: Huffman coding, Shannon Fano coding, Mutual information, Channel capacity of discrete channel, Shannon-Hartley law; Trade off between band width and SNR.

Text Books

1. Probability, Random Variables and Stochastic Processes-Athanasios Papoulis and S.Unnikrishna Pillai, PHI, 4th Edition, 2002.

2. Probability, Random Variables & Random Signal Principles-PeytonZ. Peebles, TMH, 4th Edition, 2001

Reference Books

1. Signals, Systems & Communications-B.P.Lathi, B.SPublications, 2003.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

ANALOG ELECTRONICS

UNIT-I
Introduction: Differential Amplifier, DC, AC analysis of Differiential Amplifier. FET Differential Amplifier, Differential Amplifier with Swamping Resistors, Constant Current Bias, Current mirror, Cascaded Differential Amplifier Stages, Level Translator, Operational amplifier, Block diagram representation of op-amp, schematic symbol, types of Integrated Circuits, Development of Integrated Circuits, Ideal Op-amp characteristics, equivalent circuit of an op-amp, ideal voltage transfer curve, open-loop Op-amp configurations.

UNIT-II
Op-Amp with Negative Feedback: Introduction, Block Diagram Representation of Feed back Configurations, Voltage-Series Feedback Amplifier; Negative Feedback, Closed-Loop Voltage Gain, Difference Input Voltage Ideally zero, Input Resistance with Feedback, Output Resistance with Feedback, Bandwidth with Feedback, Total out put off set voltage with feedback, voltage follower, Voltage- Shunt Feedback Amplifier; Closed loop voltage gain, inverting input terminalat virtual ground, input resistance with feedback, output resistance with feedback, band width with feedback, total output offset voltage with feedback, Current to voltage converter, Inverter, Differential Amplifiers; Differential amplifier withone, two and three Op-amps,Out put resistance and Bandwidth of Differential amplifier with feedback.

UNIT-III
Practical & Frequency response of an Op-amp: Introduction, Input off set voltage, input bias current, input offset current, total output offset voltage, Thermal Drift, Effect of variation in power supply voltage on offset voltage, change in input offset voltage and input offset current with time, other temperature and supply voltage sensitive parameters, Noise, Common-Mode Configuration and Common- Mode-Rejection Ratio.

Frequency Response, Compensating Networks, Frequency Response of Internally Compensated Op-Amps, High-Frequency Op-Amp Equivalent Circuit, Open-Loop Voltage Gainasa Function of Frequency, Closed-Loop Frequency Response, Circuit Stability, Slew Rate; Causes of Slewrate.

UNIT - IV
General Linear Applications: Introduction, DC and AC Amplifiers, AC Amplifiers

with a Single Supply Voltage, The peak Amplifier, Summing, Scaling, and Averaging Amplifiers; Inverting, Non inverting and Differential Configuration, Instrumentation Amplifier, Differential Input and Differential Output Amplifier, Voltage to Current converter with floating load and grounded load, Current to voltage converter, Integrator, Differentiation, Basic Cooperator, zero-Crossing Detector, Schmitt Trigger, voltage limiters, window detector, Analog to Digital and Digital to Analog Converters, Clippers and clampers, Peak Detector, Sample and Hold Circuit, Introduction to Rail to rail in op-amps.

UNIT-V

Active Filters and Oscillators: Introduction to Active Filters, First and second order Low-Pass Butter worth filter; filter Design, Frequency Scaling, First and Second-OrderHigh-Pass Butter worth filters, Band-Pass and Band-Stop Filters; Wide Band-Pass,Band-reject and Narrow Band-Pass,B and Rejectfilters, All-Pass Filters, Oscillators; Oscillator Principles, Oscillator Types, Frequency Stability, Phase shift oscillator, Wien Bridge Oscillator, Quadrature Oscillator, Square-Wave generator, Triangular-wave Generator, Sawtooth wave generator, Voltage controlled Oscillator.

Text Books

1. Op-Amps and Linear Integrated Circuits, Ramakant A.Gayakwad, prentice Hall of India (p) Ltd, 3rd Ed., 2002

Reference Books

1. OpAmps and Linear Integrated Circuits-Concepts andApplicationsJames MFiore, Cengage Learning/Jaico, 2009

2. Linear Integrated Circuits D.Roy Chowdhury, New Age International(p) Ltd,2nd Ed.,2003

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

DIGITAL ELECTRONICS

UNIT-I
Number systems and Boolean Algebra Digital systems, Binary Numbers, Number- Base Conversions, Octal and Hexa decimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits, Gate-level Minimization; The Map Method, Four- Variable Map, Five-Variable Map, Product-of-Sums Simplification, Don't-care Conditions, Nand and Nor Implementation, Exclusive-OR Function

UNIT-II
Combinational logic Combinational circuits, Analysis Procedure, Design Procedure, Code-conversion, Binary Adder-Subtractor, Carry Propagation, Half Subtractor, Full Subtractor, Binary Subtractor, Decimal Adder, BCD adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, and Multiplexers.

UNIT-III
Sequential logic Synchronous; Sequential Circuits, Storage Elements: Latches, introduction to Multi vibrators, Flip-Flops,Analysis of Clocked Sequential Circuits, State reduction and Assignment, Asynchronous; Analysis procedure, Circuits with latches,Design Procedure, Reduction of State and Flow Tables, Race-Free State Assignment, Hazards.

UNIT-IV
Registers and Counters Registers with parallel load,Shift registers ; Serial Transfer, Serial Addition, Universal Shift Register, Ripple Counters; Binary Ripple Counter, BCD Ripple Counter, Synchronous Counters; Binary Counter,Up-Down Counter, BCD Counter, Binary Counter with Parallel Load, Counter with Unused States, Ring Counter,Johnson Counter.

UNIT-V
Memory and Programmable Logic Random-Access Memory, Write and Read Operations, Timing waveform, Types of Memories, Memory Decoding; Internal Construction,Coincident Decoding,Address Multiplexing, Error Detection and Correction; Hamming Code, Single-Error Correction, Double-Error Detection, Read-Only Memory;Combinational Circuit Implementation, Types of ROMs,

Combinational PLDs,Programmable Logic Array,Programmable Array Logic, Sequential, Programmable Devices.

Text Books

1. M Morris Mano and Michael D.Ciletti, Digital Design, Fourth Education, Pearson 2008.

Reference Books

1. Zvi Kohavi, Switching and Finite Automata Theory, 2nd Edition, TMH

2. Introduction to Switching theory and logic design, 3rd Edition, FrederickJ. Hilland Gerald R.Peterson, John Willey and sons, 1981

3. Fundamentals of Logic design, 5th Edition, Charles H.Roth Jr.Thomson Pub.

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

SIGNALS, SYSTEMS AND SIMULATION LAB

List of experiments

1. Basic operations on matrices.
2. Generation of various signals and sequences (periodic and aperiodic), such as unit impulse, unit step, square, sawtooth, Triangular, sinusoidal, ramp, sinc.
3. Operations on signals and sequences such as addition, multiplication, scaling, shifting, folding, computation of energy and average power.
4. Finding the even and odd parts of signal / sequence and real and imaginary parts of signal.
5. Convolution between signal sand sequences.
6. Auto correlation and cross correlation between signal sand sequences.
7. Verification of linearity and time invariance properties of a given continuous/ Discrete system.
8. Computation of unit sample, unit step and sinusoidal responses of the given LTI system and verifying its physical reliability and stability properties.
9. Gibbs phenomenon.
10. Finding the Fourier transform of a given signal and plotting its magnitude and phase spectrum.
11. Wave form synthesis using Laplace transforms.
12. Locating the zeros and poles and plotting the pole-zero map sinS-plane and Z-plane for the given transfer functions.
13. Generation of Gaussiannoise (Realand Complex), computation of its mean, M.S.Value and its Skew, Kurtosis, and PSD, Probability distribution Function.
14. SamplingTheoremVerification.

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

ANALOGELECTRONICSLAB

1. Operational Amplifier
2. Summing Amplifier
3. Subtractor
4. Integrator and Differentiator
5. Astable Multivibrator
6. Monostable Multivibrator
7. Function Generator
8. Half Wave Rectifier
9. Full Wave Rectifier
10. Lowpass filter
11. High Pass Filter
12. Band Pass Filter
13. Band Stop Filter
14. Schmit Trigger
15. Wien Bridge Oscillator
16. RC Phase Shift Oscilltor
17. Digital to Analog Converter
18. A stable Multi vibrator Using 555Timer
19. Mono stable Multi vibrator Using 555Timer
20. Voltage Controlled Oscillator Applications

Aminimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **I Semester**

DIGITAL ELECTRONICSLAB

A. COMBINATIONAL CIRCUITS

1. Realization of Gates (AND,OR,NOT,NAND,NOR)
   Exercise: Realize an XOR and XNOR gates

2. Design of Half adder, Full adder using Gates
   Exercise: Design Half subtractor circuit

3. Verification of 4bit Magnitude comparator
   Exercise: Verify an 8bit Magnitude comparator

4. Design of 2 to 4 decoder
   Exercise: Implementa 3 to 8 decoder

5. Design of 2 to 1 Multiplexer
   Exercise: Implement a 4 to 1multiplexer

6. Design of 1to 4 Demultiplexer
   Exercise: Designa 1 to 4 De multiplexer using 1 to 2 De multiplexer

7. Implementation of Binary to Grey code converter
   Exercise: Implement abcd to excess-3code

8. Design a 4 bit Parity Checker
   Exercise: Design a 4 bit Parity Generator

B. SEQUENTIAL CIRCUITS

1. Verification of truth tables of D and T Flip-Flops
   Exercise: Verify JK Flip Flop

2. Implementation of Frequency divider (by8)
   Exercise: Design a divide by 4 Frequency divider

3. Conversion of JK Flip Flop to D Flip Flop
   Exercise: Convert JKF lip Flop to T flip flop

4. Design of 8bit left Shift Register
   Exercise: Design a 4 bit right Shift Register

5. Design of serial to parallel shift register
   Exercise: Design aparallel to serial ShiftRegister

6. Design of Binary counter
   Exercise: Design of Decade Counter

7. Design of Asynchronous Up counter
   Exercise: Design an Asynchronous mod counter

8. Design of Synchronous Down counter
   Exercise: Design a Synchronous UP/ Downcounter

Note: Aminimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

NETWORKS AND TRANSMISSION LINES

UNIT-I
Network elements Analysis: Resistance, Capacitance, Self inductance, Mutualinductance, Dotrule, Coefficient of coupling, Analysis of multi-winding coupled (series and parallel) circuits; Natural response and forced response,Transient response of RC,RL and RLC circuits to excitation by DC and exponential sources, Single-tuned and double-tuned coupled circuits; Complete response of RC, RL and RLC circuits to sinusoidal excitation.

UNIT-II
Network Functions and Two-port Parameters: Poles and zeros of network functions, Network functions for the one- and two-ports, Restrictions on pole and zero locations for driving point functions and transfer functions, Time-domain behavior from the pole zero plot;Open-circuit impedance,Short-circuit admittance of two-port networks; Transmission,inverse transmission,hybrid and inverse hybrid parameters;Relation between parameter sets,Inter connection of two port networks, Lattice networks,Image parameters.

UNIT-III
Filters and Attenuations: Symmetrical networks and their properties,Filter fundamentals, Pass- and stop-bands, Characteristic impedance, Constant-K low passfilter, Constant-K high pass filter, m-derived Tsection, m-derived Ð Section, Variation of characteristic impedance over the pass band, Termination with m-derived half section, B and pass filters, Filter design and performance; Symmetrical and Asymmetrical attenuations, T-type attenuator, Ð-type attenuator, Lattice attenuator, Bridged-Tattenuator, L-type attenuator.

UNIT-IV
Transmission Lines I: Types, Parameters, Transmission Line Equations, Primary &Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness / Low- loss Characterization, Distortion, Condition for distortion-free transmission and minimum attenuation, Loading,Types of Loading.

UNIT-V
Transmission LinesII: Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHFLinesas Circuit Elements;λ/4,λ/2,λ/8 LinesImpedanceTransformations, Significance of ZAnd Z, Smith ChartConfigurationandApplications, Single and Double Stub Matching.

Text Books

1. William H.Hayt, Jr.Jack E.Kemmerly and Steven M. Durbin, “Engineering Circuit Analysis”, Mc Graw Hill Science Engineering, Seventh Edition, 2006(Unit 1, 2)

2. M.E.Vanvalkenburg, Network Analysis, 3rd Edition PHI, 2003(Unit2)

3. Network TheorySudarshan and Shyam Mohan, TMH. (Unit3)

4. Transmission Lines and NetworksUmesh Sinha, Satya Prakashan, 2001, (Tech.India Publications), New Delhi (Unit4,5)

Reference Books

1. Joseph Edminister and Mahmood Nahvi,“Electric Circuits”,Schaum's Outline Series, Fourth Edition, Tata Mc Graw Hill Publishing Company, New Delhi, 2003.

2. DavidA.Bell, “Electric Circuits”, Sixth Edition, PHI Learning, New Delhi, 2003.

3. VasudevKAtre, Network Theory and Filter Design, 2nd Edition,Wiley Eastern, 2002

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

COMPUTER ORGANIZATION & OPERATING SYSTEMS

UNIT-I

Basic Structure of Computers: Computer Types, Functional Unit, Basic OPERATIONAL Concepts, Bus Structures, Software, Multiprocessors.

Register Transfer Language 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, Instruction Codes, Computer Registers Computer Instructions instruction Cycle. Memory reference Instructions, Input output, STACK Organization, Instruction Formats, Addressing Modes, DATA Transfer and Manipulation, Program Control.

UNIT-II

Micro-programmed Control: Control Memory, Address Sequencing, Micro program Examples, Design of Control Unit, Hard Wired Control, Micro-programmed Control

The Memory System: Basic Concepts of Semi conductor RAM Memories, Read-Only Memories, Cache Memories Performance Considerations, Virtual Memories Secondary Storage.

UNIT-III

Input-Output Organization: Peripheral Devices, Input-Out put Interface, Asynchronous Data Transfer Modes, Priority Interrupt, Direct Memory Access, Input output Processor(IOP),Serial Communication; Introduction to Peripheral Components, Inter connect (PCI) Bus.

UNIT-IV

Operating Systems Overview: Overview of Computer Operating Systems Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating Systems Structures-Operating System Services and Systems Calls, System Programs, Operating Systems Generation

Memory Management: Swapping, Contiguous Memory Allocation, Paging, Structure of The Page Table, Segmentation, Demand Paging, Page-Replacement Algorithms, Allocation of Frames, Thrashing. Introduction to Deadlock.

UNIT-V

File System Interface: The Concept of a File, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection.

File System Implementation: File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

Text Books

1. Computer Organizational Hamacher, Zvonks Vranesic, Safea Zaky, Vth Edition, McGraw Hill.

2. Computer Systems Architecture M.MorisMano, IIIrd Edition, Pearson

3. Operating System Concepts-Abraham Silberchatz, PeterB.Galvin, Greg Gagne, 8th Edition, John Wiley.

Reference Books

1. Computer Organization and ArchitectureWilliam Stallings Sixth Edition, Pearson

2. Structured Computer OrganizationAndrewS.Tanenbaum, 4th Edition PHI

3. Fundamentals of Computer Organization and Design-Sivaraama D and amudi Springer Int. Edition.

4. Operating Systems internals and Design Principles, Stallings, sixth Edition2009, Pearson Education.

5. Modern Operating Systems, Andrew S Tanenbaum 2nd Edition, PHI.

6. Principles of Operating Systems, B.L.Stuart, Cengage Learning, India Edition.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

ANALOG COMMUNICATIONS

UNIT-I
Amplitude Modulation: Introduction to communication system, Need for modulation, Frequency Division Multiplexing, Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM WAVES, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector, Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSBSC Waves, Balanced Modulators, Ring Modulator, Coherent detection of DSB-SC Modulated waves, COSTAS Loop.

UNIT-II
SSB Modulation: Frequency domain description, Frequency discrimination method for generation of AMSSB Modulated Wave, Timed omain description, Phased is crimination method for generating AMSSB Modulated waves. Demodulation of SSB Waves, Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Timed omain description, Envelope detection of a VSB Wave plus Carrier, Comparison of AM Techniques, Applications of different AM Systems.

UNIT-III
Angle Modulations: Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission band width of FM Wave- Generation of FM Waves, Direct FM, Detection of FM Waves: Balanced Frequency discriminatory, Zero crossing detector, Phase locked loop, Comparison of FM and AM.

UNIT-IV
Noise in Analog Modulation: Noise in Analog communication System, Noise in DSB and SSB System, Noise in AM System, Noise in Angle Modulation System, Threshold effect in Angle Modulation System, Pre-emphasis and de-emphasis.

UNIT-V
Pulse Modulation: Types of Pulse modulation, PAM, PWM, PPM: Generation and demodulation, Time Divison Multiplexing.

Related topics: TRF Receiver, Superheterodyne Receiver, Automatic Gain Control, FM Receiver, FM stereo multiplexing

Text Books

1. Analog and Digital CommunicationsSimon Haykin, John Wiley, 2005

2. Electronics & Communication SystemGeorge Kennedy and Bernard Davis, TMH 2004.

Reference Books

1. Analog and Digital CommunicationK.Sam Shanmugam, Willey, 2005

2. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5th Edition, 2009, PHI.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

MICRO CONTROLLERS

UNIT-I
Introduction and 8051 Architecture: Introduction to micro controllers, comparing microprocessors and micro controllers, 4,8,16 and 32 bit micro controllers, Development systems for Micro controllers, Architecture; Architecture of8051, pin configuration of 8051 micro controller, hardware input pins, output pins ports and external memory, counters and timers, serial data input and output and interrupts.

UNIT-II
Moving Data and Logical Operations: Introduction, Addressing modes, External Data moves, Code Memory Read-only Data Moves, PUS Hand POPOp codes, Data Exchanges, Logical Operations; Introduction, Byte-Level Logical Operations, Bit- Level Logical Operations, Rotateand Swap Operations

UNIT-III
Arithmetic Operations, Jump and Call Opcodes: Introduction, Flags, Incrementing and Decrementing, Addition, Subtraction, Multiplication and Division, Decimal Arithmetic, Jump and Callopcodes; introduction,The jump and call program range, Jumps,Calls and Subroutines,call and returns, Interrupts and Returns

UNIT-IV
8051 Micro controller Design: Introduction, A microcontroller specification, A microcontroller Design, Testing the Design, Timing subroutines, Lookup Tables for the 8051, Serial Data Transmission.

UNIT-V
Applications and Serial Data Communication: Introduction, Keyboards, Displays, Pulse Measurement, D/A and A/D Conversions, Multiple Interrupts, Serial data Communication; Introduction, Network Configurations, 8051 Data Communication Modes,

Text Books

1. Kenneth J.Ayala, The 8051 Microcontroller Architecture Programming and Applications, 2nd Edition, Penram International Publishers (I), 1996.

Reference Books

1. Mohammed AriMazidi and JanciGillispie, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

UNIT-I
OOP Concepts: History of Java, Java buzz words, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects-conceptsof classes, objects, constructors, methods, access control, this keyword, garbage collection, over loading methods and constructors, parameter passing, recursion, string handling

UNIT-II
Inheritance: Base class object, subclass, Member access rules, super uses, using final with in hesitancy, Polymorphism-method overriding, abstract classes.

Packages and Interfaces: Defining, Creating and Accessing a Package, importing packages

Defining an interface, implementing interface, differences between classes and interfaces and extending interfaces. Exploring packages Java.io, java.util.

UNIT-III
Exception Handling: Concepts of exception handling, benefits of exception handling exception hierarchy, Checked and Unchecked Exceptions, usage of try, catch, throw, throws and finally, builtin exceptions, creating own exception sub classes.

Multithreading: Differences between multi threading and multitasking, thread lifecycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT-IV
Event Handling: Events ,Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT classhierarchy, user interface components-labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists, layout manager layout manager types border, grid, flow, card and grid bag

UNIT-V
Applets: Concepts of Applets, differences between applets and applications,life

cycle of an applet,types of applets,creating applets,passing parameters to applets.

Swing: Introduction, limitations of AWT, Components, containers, exploring swing- JApplet,JFrame and Jcomponent, Icons and Labels, text fields, buttons The JButton class, Check boxes, Radio buttons, Comboboxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

Text Books

1. Java; the complete reference,7th editon,HerbertSchildt,TMH.

2. UnderstandingOOPwithJava, updated edition, T.Budd, Pearson education.

Reference Books

1. An Introduction to programming and OOdesign using Java, J.Nino and F.A. Hosch, John Wiley & sons.

2. An Introduction to OOP, second edition, T.Budd, pearson education.

3. Introduction to Java programming6thedition, Y.Daniel Liang, Pearson education.

4. An introduction to Java programming and object oriented application development, R.A.Johnson-Thomson.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

ANALOG COMMUNICATIONS LAB

1. AM Modulator and Demodulator

a) To construct AMmodulator and demodulator circuit and to trace message, carrier, modulated and demodulated signal.

b) To determine the modulation index of AM by classical method and trapezoidal method.

2. FM Modulator and Demodulator

a) To construct frequency modulator and demodulator circuit and to trace message, carrier, modulated and demodulated signal.

3. Sample & Hold and PAM

a) To construct sample and hold circuit and to trace the message and sample and hold signal.

b) To construct PAM circuit and to trace the input and PAM signal.

4. Pre-emphasis and de-emphasis

To construct pre-emphasis and de-emphasis circuit and to determine the frequency response.

5. Tuned and Wide Band Amplifiers

To construct tuned and wide band amplifiers and to determine the frequency response.

6. Frequency mixer and ring modulator

a) To construct a frequency mixer and to test its operation.

b) To construct a ring modulator and to trace the DSB-SC waveform.

7. Simple and delayed AGC

To construct simple and delayed with and without AGC circuit and to test its impact.

8. PWM and PPM

a) To construct PWM and PPM circuit and trace the output waveforms.

9. TDM

Construct TDM circuit and to trace the multiplexed and de-multiplexed waveform.

10. SSBSC Modulation and Demodulation

11. Design of Mixer

12. PAM and Reconstruction

13. Effect of Noise on the Communication Channel

14. Diode Detector Characteristics.

15. Squelch Circuit

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

MICRO CONTROLLERS LAB

List of experiments on 2 Gkit

1. LED patterns

a) Blinking LEDs, b)Serial lights, c)Halfon/Halfoff, d)Alternate on/off

2. Switches & LEDs

a) Press switch to make corresponding LED on,

b) Press switch to make corresponding LED of f

c) First switch press,last LED on,

d)First switch press, last LED off

3. LCD

a) Character & string display on LCD,

b) SW1-Display strring1on first line of LCD,

c) SW2-Display strring1on second line of LCD.

3. UART

a) Echo Program,

b) Take comm. And from PC & glow corresponding LED,

c) Press Switch & displays witch number on PC,

d) Display data received by UART on LCD

4. TRIAC

a) 220V AC bulb switch on/off, b) 22oV AC fan speed control with fixed step size,

5. ADC

a) Raw ADC value display on LCD,

b) Raw ADC value display on Hyper Terminal,

c) Engineering unit conversion and display on LCD,

d) Engineering unit conversion and display on Hyper Terminal

e) Limit checking for temperature value and switching on fan using triac

f) Limit checking for ambient light value and switching on light using triac.

6. DAC

a) Fixed step incremented DAC,output seen on multi-meter.

b) DAC input value received from Hyper Terminal

c) DAC input value taken from switches input value taken from switches

7. DC motor

a) DC motor control-CW,CCW and stop using switches.

b) DC motor control- CW, CCW and stop using commands received from Hyper Terminal.

8. Zig Bee

a) Receive data on ZigBee from PC ZigBee dongle and display data on LEDs

b) Receive data on ZigBee from PC ZigBee dongle and display data on LCD

c) Read ADC and transmit data using ZigBee

d) Triac based control of fan and light using data received on ZigBee

9. RF433MHz

a) Receive data on RF rom another kit with RF transmitter. Connect PCs to both kits.Type in data in Hyper Terminal of Transmitter kit & see on Hyper Terminal of Receiver kit.

b) Read switches on transmitter kit, send their status on RF to receiver kit and control motor using switch status.

10. Blue tooth

a) Transfer data to PC using Blue link.

b) Receive data from PC using Blue Link & display on LCD.

c) Transfer data from mobile phone (using a J2ME app) and receive using Blue link and control motor operatio.

d) Transfer data from mobile phone (using a J2ME app) and receive using Blue Link and control electrical appliance operation

11. Ethernet

a) Transfer data to PC using WIZI05SR and display on Hyper Terminal.

b) Implement an embedded web server.

12. RTC

a) Read and display RTC data on LCD,

b) Read and display RTC data on Hyper Terminal,c)Set RTC using Hyper terminal and display data on Hyper Terminal,d)Implementan Event Logger with Time Stamp display.

13. SD card

a) Transfer data to PC, store on SDcard and retrieve it back (block transfer)
b) Implement FAT file system on SD card

c) Implement data acquisition system and store data ina CSV file on SD card with time stamp

Note: A minimum of 10(Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (ECE) **II Semester**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

1. Simple Java applications-Handling strings in java
2. Simple Package creation-Developing user defined packages in Java
3. Interfaces-Developing user-defined interfaces and implementation-Useof Predefined interface
4. Threading and Multithreading
5. Exception Handling mechanism inJava-Handling pre-defined exceptions-Handling user-defined exception
6. Programs using applets
7. Largest Number Finding of NValues
8. Sorting of Name(String)
9. String Manipulation
10. Overloading & Constructor Implementation
11. Bank Operation using Class &Object
12. User Defined Package Creation
13. Multiple Inheritances using Interface
14. Simple AWT to Design Simple Calculator
15. Biodata Generation using Frame
16. Drawing 2DShapes using Menubar

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

III-Year

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

UNIT-I

Introduction & Demand Analysis: Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

UNIT-II

Production & Cost Analysis: Production FunctionIsoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis:Cost concepts. Break-evenAnalysis(BEA)-Determination of Break-Even Point(simple problems)-Managerial Significance.

UNIT-III

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing: Objectives and Policies of Pricing. Methods of Pricing. Business: Features and evaluation of different forms of Business Organisation: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalization scenario.

UNIT-IV

Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital.. Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

UNIT-V

Introduction to Financial Accounting & Financial Analysis: Accounting concepts and Conventions-Double-Entry Book Keeping, Journal, Ledger, Trial Balance-Final Accounts (Trading Account,Profit and Loss Account and Balance

Sheet with simple adjustments).

Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, Capital structure Ratios and Profitability ratios. DuPont Chart.

Text Books

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.

2. Atmanand: Managerial Economics, Excel, 2008.

Reference Books

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2009

2. H.Craig Peterson& W.CrisLewis, Managerial Economics, PHI, 2009

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

DIGITAL COMMUNICATIONS

UNIT-I
Elements of Digital Communication Systems: Model of Digital Communication Systems, Digital Representation of Analog Signal, Sampling Theorem, Pulse Code Modulation; PCM Generation and Reconstruction, Quantization Noise, Non Uniform Quantization and Companding, DPCM, Adaptive DPCM, DM and AdaptiveDM, Noise in PCM and DM.

UNIT-II
Digital Modulation techniques: Introduction, ASK, ASK Modulator, Coherent ASK Detector, Non-Coherent ASK Detector, FSK, Band width and Frequency Spectrum FSK, Non Coherent FSK Detector, Coherent FSK Detector, FSK Detection using PLL, BPSK, Coherent PSK Detection, QPSK, Differential PSK.

UNIT-III
Base band Transmission and Optimal Reception of Digital Signal: Pulse Shaping for Optimum Transmissions, Base band Signal Receiver, Probability of Error, Optimum Filter, Matched Filter, Probability of error using Matched Filter Optimal of Coherent Reception, Calculation of Error Probability of ASK, BPSK, BFSK, QPSK.

UNIT-IV
Error Control Codes Linear Block Codes; Matrix Description of Linear Block Codes, Error Detection and Error Correction Capabilities of Linear Block Codes. Cyclic Codes; Algebraic Structure, Encoding, Syndrome Calculation, Decoding. Convolution Codes; Encoding, Decoding using State, Tree and Trellis Diagrams, Decoding using Viterbi Algorithm.

UNIT-V
Spread Spectrum Modulation: Use of Spread Spectrum, Direct Sequence Spread Spectrum (DSSS), Code Division Multiple Access, Ranging using DSSS, Frequency Hopping Spread Spectrum, PN-Sequences: Generation and Characteristics, Synchronization in Spread Spectrum Systems.

Text Books

1. Digital Communications, 8thEdition, JohnWiley & Sons,Simon Haykin, Inc 2007

Reference Books

1. Taub and Schilling, Principles of Communication Systems,2nd Edition, TMH,1986
2. Digital and Analog Communication Systems, John Wiley & Sons, Inc, 2002
3. Analog and Digital Communications,2nd Edition,HSUHWEI, Schaum's outlines, TMH,2003
4. Communication systems 3rd edition, John Wiley & Sons, Simon Haykin,1999

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

ELECTROMAGNETIC FIELDS

UNIT -I
Electro statics: Electrostatic Fields Coulomb's Law Electric Field Intensity (EFI) EFI due to a line and a surface charge Work done in moving a point charge in an electrostatic field Electric Potential Properties of potential function Potential gradient Guass's law Application of Guass's LawMaxwell's first law, div (D) =r Laplace's and Poison's equations Solution of Laplace's equation in one variable.Electric dipole Dipole moment potential and EFI due to an electric dipole Torqueonan Electric dipole in an electric field Behaviors of conductors in an electric field Conductor sand Insulators.

UNIT-II
Dielectrics & Capacitance: Behavior of conductors in an electric field Conductors and Insulators Electric field inside a dielectric material polarization Dielectric Conductor and Dielectric Dielectric boundary conditions Capacitance Capacitance of parallel plots spherical co-axial capacitors with composite dielectrics Energy stored and energy density in a static electric field Current density conduction and Convection current densities Ohm's law in point form Equation of continuity

UNIT -III
Magne to Statics: Static magnetic fields Biot-Savart's law Magnetic Field Intensity(MFI)MFI due to a straight current carrying filament MFI due to circular, square and solenoid current Carrying wire Relation between magnetic flux, magnetic flux density and MFI Maxwell's second Equation, div(B)=0,

Ampere's Law & Applications: Ampere's circuit allaw and its applications viz. MFI due to an infinite sheet of current and along current carrying filament Point form of Ampere's circuit allaw Maxwell's third equation, Curl(H)=Jc.

UNIT -IV
Force in Magnetic fields and Magnetic Potential: Magnetic force- Moving charges in a Magnetic field Lorentz force equation force on a current element in a magnetic field Force on a straight and a long current carrying conductor in a magnetic field Force between two straight long and parallel current carrying conductors Magnetic dipole and dipole moment a differential current loop as a magnetic dipole Torque on a current loop placed in a magnetic field.

Scalar Magnetic potential and its limitations vector magnetic potential and its properties vector magnetic potential due to simple configurations vector Poisson's equations. Self and Mutual inductance Neumann's formulae determination of self- inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane energy stored and density in a magnetic field. Introduction to permanent magnets, characteristics and applications.

UNIT-V

Time Varying Fields: Time varying fields Faraday's laws of electromagnetic induction Its integral and point forms Maxwell's fourth equation, Curl(E)=-¶B/¶tStatically and Dynamically induced EMF's Simple problems -Modification of Maxwell's equations for time varying fields Displacement current.

Text Books

1. Mathew N O Sadiku, Elements of Electromagnetics, 4thed., Oxford University Press,2007

2. W H Hayt, JA Buck, Engineering Electromagnetics, 8th ed., TMH,2010

Reference Books

1. JosephAEdminister, Theory and Problems of Electromagnetics, 2nded., Schaum's Outline Series,Mc-Graw Hill International,1993

2. NathanIda, Engineering Electromagnetics, Springer (India) Pvt Ltd,2nded., 2005

3. Bhag Singh Guru, Husey in RHiziroglu,"Electromagnetic Field Theory Fundamentals", Cambridge Univ.Press, 2004

4. John D Kraus, "Electromagnetics", McGraw Hill, 4th ed., 1992

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

VLSI DESIGN

UNIT-I
MOS Technology Introduction to IC Technology MOS, PMOS, NMOS, CMOS & BiCMOS Technologies; Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors, CMOS Nanotechnology

UNIT-II
Basic Electrical Properties: Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS Transistor Threshold Voltage, gm, gds, Figure of Merit ωo; Pass Transistor, NMOS Inverter, Various Pull Ups, CMOS Inverter Analysis and Design, Bi-CMOS Inverters.

UNIT-III
VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 μm CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

Gate Level Design: Logic Gates and Other Complex Gates, Switch Logic, Alternate Gate Circuits, Time Delays, Driving Large Capacitive Loads, Wiring Capacitance

UNIT-IV
Data Path Subsystems: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity Generators, Comparators, Zero/One Detectors, Counters.
Array Subsystems: SRAM, DRAM, ROM, Serial Access Memories, Content Addressable Memory.

UNIT-V
Semiconductor Integrated Circuit Design: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach

CMOS Testing: CMOS Testing, Need for Testing, Test Principles, Design Strategies for Test, Chip Level Test Techniques, System-Level Test Techniques.

Text Books

1. Essentials of VLSI Circuits and Systems Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition

2. CMOS VLSI Design A Circuits and Systems Perspective, Neil H. E Weste, David Harris, Ayan Banerjee, Pearson, 2009.

Reference Books

1. CMOS Logic Circuit Design - John .P. Uyemura, Springer, 2007.

2. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.

3. VLSI Design A.Albert Raj, Latha, PHI, 2008

4. Introduction to VLSI Mead & Convey, BS Publications, 2010

5. VLSI Design M. Micheal Vai, CRC Press, 2009.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

CONTROL SYSTEMS

UNIT-I
System Modeling: Introduction to control system-Basic elements in control system Open and closed loop control systems Differential equation representation of physical systemsTransfer functionMathematical modeling of electrical and mechanical systems (Translational and Rotational) Analogous system- Block diagram representation of systems- Block diagram reduction techniquesSignal flow graph.

UNIT-II
Time Domain Analysis: Standard test signals-First order system-step, ramp and impulse response analysis-Second order systemstep response analysis- steady state error generalized error co-efficientsEffect of adding a zero to system-stability analysis Routh Hurwitz criterion Root locus method

UNIT-III
Frequency Domain Analysis: Frequency response Frequency domain specifications Correlation between time domain and frequency domain specifications-Bode plot Stability analysis using Bode plot- transfer function from bode plot-Polar plotNyquist stability criterion.

UNIT-IV
State Space Analysis: Introduction Concepts of state, state variables and state model State model of linear systems system realization-State space representation using physical, phase and canonical variables diagonal canonical form-Jordan canonical form diagonalization- Time domain solution of state equation-State transition matrix-Laplace transform solution of state equations-Derivation of transfer function from the state model- Controllability and observability- State space representation of discrete time systems.

UNIT-V
Classical Control Design Techniques: Compensation techniques Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

Text Book

1. I.J.Nagrath, M. Gopal, “Control Systems Engineering”, Fifth Edition, NewAgeInternational, New Delhi, 2007.

Reference Books

1. Benjamin C.Kuo,“Automatic Control Systems”,Seventh Edition,PHI Learning New Delhi, 1997.

2. Katsuhiko Ogata,“Discrete Time Control Systems”,Second Edition,PHI Learning New Delhi,2006.

3. R.Anandanatarajan, P.RameshBabu,“Control Systems Engineering”,Second edition,Scitech Publications Pvt.(India)Ltd,2008

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

VLSI LAB

Design and implementation of the following CMOS digital /analog circuits using Cadence/ Mentor Graphics/ Synopsys CAD tools including: Gate-level design, Transistor-level design, Hierarchical design, Verilog HDL Equivalent / VHDL design, Logic Synthesis, Simulation and Verification, Scaling of CMOS Inverter for Different Technologies, Study of Secondary Effects (Temperature, Power Supply and Process Corners),Circuit Optimization with Respect to Area, Performance and / or Power, Layout, Extraction of Parasitics and Back Annotation and Related, Modifications in Circuit Parameters and Layout Consumption, DC/ Transient Analysis, Verification of Layouts(DRC,LVS)

VLSI Programs

1. Introduction to Layout Design Rules
2. Layout of Basic Logic Gates
3. Layout of CMOS Inverter
4. Layout of CMOS NOR/NAND Gates
5. Layout of CMOSXOR and MUX Gates
6. Layout of CMOS1-bit Full Adder
7. Layout of Static / Dynamic Logic Circuit (Register Cell)
8. Layout of Latch
9. Layout of PassTransistor
10. Layout of any Combinational Circuit (Complex CMOS Logic Gate)-Learning about Data Paths
11. Introduction to SPICE Simulation and Coding of NMOS/CMOSCircuit
12. SPICE Simulation of Basic Analog Circuits: Inverter/ Differential Amplifier
13. Analog Circuit Simulation (ACAnalysis)CS&CD Amplifier.
14. System Level Design usingPLL
15. Finite State Machine Design

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

DIGITAL COMMUNICATION LAB

1. Design and Implementation of Uniform Quantizer
2. PCM Generation and Detection
3. Differential Pulse Code Modulation
4. Delta Modulation and Demodulation
5. Time Division Multiplexing of 2B and LimitedSignals
6. Design and implementation of ASK Generator and Detector
7. Design and implementation of PSK Generator and Detector
8. Design and implementation of FSK Generator and Detector
9. Quadrature Phase Shift Keying modulation & Detection.
10. Differential Phase Shift Keying
11. Design and Implementation of Convolutional Coders
12. Design and Implementation of Cycliccode Encoder and its corresponding Syndrome Calculator
13. Generation of PNSequence and Gold Sequences
14. BER Analysis of binary digital Modulation Schemes (ASK, PSK and FSK)in the presence of Additive White Gaussian Noise
15. BERAnalysisofDirectSequenceSpreadSpectrumCommunicationsystem in the presence of AWGN and interference.

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **I Semester**

ADVANCED MICRO CONTROLLERS LAB

The Advanced Microcontroller Lab will be based on anARM7Development Kit. The list of experiments in the Lab will be:

1. LEDs and Switches
2. Serial Communication
3. Sensor reading with ADC
4. Digital to Analog Converter
5. Graphical Display
6. ARM programming-Digital IOs
7. ARM programming-Serial communication
8. Timers
9. Interrupts
10. RTOS Task definition
11. Multiple task operations with priority
12. Project (Operationg System based)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

MANAGEMENT SCIENCE

UNIT-I

Introduction to Management & Organisation: Concepts of Management and organization-nature, importance and Functions and Theories of Management, Systems Approach to Management, Leadership Styles, Social responsibilities of Management. Designing Organisational Structures: Basic concepts related o Organisation - Departmentation and Decentralisation, Types and Evaluation of mechanistic and organic structures of organisation and suitability.

UNIT-II

Operations & Marketing Management: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study- Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: control charts for Variables and Attributes,(simple Problems) and Acceptance Sampling, Deming's contribution to quality.Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure,Stores Management and Stores Records-Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT-III

Human Resources Management (HRM):Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement,Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration,Job Evaluation and Merit Rating.

UNIT-IV

Project Management (PERT/CPM): Network Analysis, Program Evaluation and Review Technique (PERT),Critical Path Method(CPM),Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis,Project Crashing(simple problems).

UNIT-V

Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programs, Elements of Corporate Planning Process, Environmental Scanning,Value Chain Analysis,SWOT Analysis,Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Contemporary Management Practices: Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM),Six sigma and Capability Maturity Model (CMM)Levels, Supply Chain Management, Enterprise Resource Planning(ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking,Balanced Score Card.

Text Books

1. Aryasri: Management Science, TMH, 2009.

2. Stoner, Freeman, Gilbert, Management, Pearson Education, 2009.

Reference Books

1. Kotler Philip & Keller Kevin Lane: Marketing Management, PHI, 2009

2. Koontz & Weihrich: Essentials of Management,TMH,2009.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

ANTENNAS ANDWAVE PROPAGATION

UNIT-I

EM wave propagation in unbounded media: Solution of Maxwell's Equations in Perfect Dielectrics. Plane Wave propagation in perfect dielectrics. Wave polarization, Power flow and Poynting theorem. Propagation in lossy dielectrics. Propagation in conductors. Boundary conditions for time-varying fields. Reflection of plane-waves at normal incidence, Standing Wave Ratio,Refractive index, Reflection at oblique incidence, Parallel and Perpendicular polarizations, Total internal reflection and Brewster angle.

UNIT-II

Radiation: Radiation Mechanism, Potential functions-heuristic approach, Maxwell's equation approach, Potential functions for sinusoidal oscillations, Alternating current element, Power radiated by current element, Application to short antennas, Assumed current distribution, Radiation from quarter wave Monopole / half wave dipole, Traveling wave antennas and the effect of the point of feedon standing wave antennas.

UNIT-III

Antenna Fundamentals: Isotropic, Directional, Omni-directional patterns, Principal patterns, Field regions, Radiation density, Radiation intensity, Directive gain, Power gain, Half power Beam width, Antenna polarisation, Power loss factor, Radiation efficiency, Effective aperture of antenna, Relation between maximum effective aperture and directivity, Friis transmission equation.

UNIT-IV

Array Antennas and Characteristics: Two element array, Uniform linear array, Side lobe level and beam width of broad side array, Beam width of end fire array, Principle of multiplication of patterns, Binomial array, Basic principle of Dolph-Tsche by scheff array.

Rhombic antennas, Folded Dipole, Loop antenna, YagiUda array, Helical antenna, Corner reflector antenna, Parabolic reflector antennas, Cassegrain system of reflectors.

UNIT-V

Radio Wave Propagation: Ground wave Propagation, Earth constants, Space-wave Propagation, Effect of curvature of an Ideal Earth, Variations of Field strength with height in space-wave Propagation, Atmospheric effects in space-wave Propagation, Radio-Horizon, Duct Propagation, Extended-range Propagation resulting from Tropospheric Scattering, Ionospheric Propagation, Gyro frequency, Refraction and reflection of Sky-Waves by the Ionosphere, Critical Frequency, Skip Distance, Maximum Usable Frequency.

Text Books

1. Constantine ABalanis, Antenna Theory: Analysis and Design, Harper and Row Publishers, 2002
2. Edward C Jordan and Keith G Balmain, Electromagnetic Waves and Radiating Systems, 2nd Edition, PHI, 2003

Reference Books

1. J.D.Kraus and Ronald JMarhefka, Antennas For all Applications, TMH, 2003

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

EMBEDDED SYSTEMS

UNIT-I

Introduction to Embedded Processors: Introduction to Embedded Computing, Issues and Challenges in Embedded system Design, Trends: SC, custom designed chips, configurable designed chips, configurable processors and multi- core processors. Embedded processor architecture: General concepts, instruction sets, Levels in architecture, Functional description-hardware/software trade-off Introduction to RISC architecture, Pipelining, Instruction issue and execution, Instruction formats, Addressing modes, Data alignment and byte ordering.

UNIT-II

Devices and Buses for Devices Network: I/ODevices:-Types and Examples of I/O devices, Synchronous, Iso-synchronous and Asynchronous Communications from Serial Devices - Examples of Internal Serial-Communication Devices:- SPI, UART, Parallel Port Devices-Timer and Counting Devices–Serial Communication using: 'I2C','USB','CAN'-Advanced I/O Serial high speed buses:ISA, PCI,PCI- X, cPCI and advanced buses.

UNIT-III

Programming Concepts and Embedded Programming in C, C++ : Programming in assembly language (ALP) vs High Level Language - C Program Elements:- Macros and functions, Use of Date Types, Structure, Pointers, Function Calls - Concepts of Embedded Programming in C++:- Objected Oriented Programming, Embedded Programming in C++, 'C' Program compilers – Cross compiler–Optimization of memory needs.

UNIT-IV

Real Time Operating Systems: Definitions of process,tasks and threads– Inter Process Communication:-Shared data problem, Use of Semaphore(s), Priority Inversion Problem and Deadlock Situations, Message Queues, Mailboxes,Pipes, Virtual (Logical) Sockets, Remote Procedure Calls (RPCs) – Operating System Services:-Goals, Structures, Kernel, Process Management, Memory Management, Device Management-Real Time Operating System-RTOS Task scheduling models:- Co-operative Round Robin Scheduling, Cyclic Scheduling with Time Slicing.

UNIT-V

System Design Techniques: Design Methodologies, Requirement Analysis, Specification, System Analysis and Architecture Design. Design Examples:- Telephone PBX-System Architecture, Inkjet printer-Hardware Designand Software Design, Personal Digital Assistants, Set-top Boxes.

Text Books

1. Rajkamal, Embedded Systems Architecture, Programming and Design,TATA McGraw-Hill,First reprint Oct.2003

Reference Books

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes,

2. David E.Simon, An Embedded SoftwarePrimer, Pearson Education Asia,First Indian Reprint 2000.

3. FrankVahid and Tony Givargis, Embedded Systems Design–A Unified Hardware / Software Introduction, John Wiley, 2002.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

DIGITAL SIGNAL PROCESSING

UNIT-I
Introduction: Introduction to Digital Signal Processing: Discrete Time Signals & Sequences, Linear Shift Invariant Systems, Stability, and Causality, Linear Constant Coefficient Difference Equations, Frequency Domain Representation of Discrete Time Signals and Systems

UNIT-II
Discrete Fourier series: DFS Representation of Periodic Sequences, Properties of Discrete Fourier Series, Discrete Fourier Transforms: Properties of DFT, Linear Convolution of Sequences using DFT, Computation of DFT: Over-Lap Add Method, Over-Lap Save Method, Relation between DTFT, DFS, DFT and Z-Transform.Fast Fourier Transforms: Fast Fourier Transforms (FFT)-Radix-2 Decimation-in-Time and Decimation-in-Frequency FFT Algorithms, Inverse FFT, and FFT with General Radix-N.

UNIT-III
Realization of Digital Filters: Applications of Z–Transforms, Solution of Difference Equations of Digital Filters, System Function, Stability Criterion, Frequency Response of Stable Systems, Realization of Digital Filters – Direct, Canonic,Cascade and Parallel Forms.

UNIT-IV
IIR Digital Filters: Analog filter approximations–Butterworth and Chebyshev, Design of IIRDigital Filters from Analog Filters, Step and Impulse Invariant Techniques, Bilinear Transformation Method, Spectral Transformations.

UNIT-V
FIR Digital Filters: Characteristics of FIRDigital Filters, Frequency Response, Design of FIR Filters: Fourier Method, Digital Filters using Window Techniques, Frequency Sampling Technique, Comparison of IIR & FIR filters.

Text Books

1. Digital Signal Processing, Principles, Algorithms, andApplications: JohnG. Proakis, Dimitris G.Manolakis, Pearson Education/PHI,2007.

2. Discrete Time Signal Processing–A.V.Oppenheim and R.W.Schaffer,PHI,

3. Fundamentals of Digital Signal Processing–Lonnie Ludeman, JohnWiley, 2009

Reference Books

1. Johnny R.Johnson, Introduction to Digital Signal Processing, PHI, 2001.

2. Andreas Antoniou, Digital Signal Processing, TMH, 2006.

3. John G.Proakis, Dimitris G Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, Pearson Education / PHI, 2003

4. Lonnie C Ludeman, Fundamentals of Digital Signal Processing, John Wiley & Sons, 2003.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

DATA STORAGE SYSTEMS (OE)

UNIT-I
Introduction to Storage Technology: Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

UNIT-II
Storage Systems Architecture: Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment, Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components, Different RAID levels and their suitability for different application environments: RAID0, RAID1, RAID3, RAID4, RAID5, RAID0+1, RAID1+0, RAID6,Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system

UNIT-III
Introduction to Networked Storage: Evolution of networked storage, Architecture, components, and topologies of FC-SAN,NAS,and IP-SAN,Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS ulfils the need , Understand the appropriateness of the different networked storage options for different application environments

UNIT-IV
Information Availability & Monitoring & Managing Datacenter: List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR),RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures, Architecture of backup / recovery and the different backup/recovery topologies, replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities.

Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center

UNIT-V

Securing Storage and StorageVirtualization: Information security, Critical security attributes for information systems,Storage security domains,List and analyzes the common threats in each domain,Virtualization technologies, block-level and file-level virtualization technologies and processes CaseStudies

The technologies described in the course are reinforced with EMC examples of actual solutions.

Realistic case studies enable the participant to design the most appropriate solution forgiven sets of criteria.

Text Books

1. EMC Corporation, Information Storage and Management, G.Somasundaram, A.Shrivastava,Wiley Publishing.

2. Robert Spalding, “Storage Networks: The Complete Reference”, TataMcGraw Hill, Osborne, 2003.

Reference Books

1. MarcFarley, “Building Storage Networks”, Tata McGraw Hill, Osborne, 2001.

2. Meeta Gupta, Storage Area Network Fundamentals,Pearson Education Limited, 2002.

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

MULTIMEDIA SYSTEMS (OE)

UNIT-I
Introduction: To Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work.Convergence of Computer, Communication and Entertainment products

Stages of Multimedia Projects: Multimedia hardware, Memory & storage devices, Communication devices, Multimedia, software's, presentation tools, tools for object generations, video,sound, image capturing, authoring tools,card and page based authoring tools.

UNIT-II
Multimedia Building Blocks: Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio & Video Capture.

UNIT-III
Data Compression: Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, Arithmetic Coding Higher Order Modelling. Finite Context Modelling, Dictionary based Compression, Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio loss less & lossy compression.

UNIT-IV
Speech Compression & Synthesis: Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression & silence compression.

UNIT-V
Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formatic animations Images standards, JPEG Compression, Zig Zag Coding, Multimedia Database. Content based retrieval for text and images,Video: Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streamingonnet, Video Conferencing, Multimedia Broad cast Services, Indexing and retrieval of Video Database, recent development in Multimedia.

Text Books

1. Tay Vaughan,“Multimedia, Making IT Work”, McGrawHill.

Reference Books

1. Buford, “ Multimedia Systems”, Addison Wesley.
2. Mark Nelson,“Data Compression HandBook”,BPB.
3. Sleinreitz, “Multimedia System”,Addison Wesley.

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

SYSTEM MODELING AND SIMULATION (OE)

UNIT-I
Basic Simulation Modeling, Systems, Models and Simulation,Discrete Event Simulation, Simulation of single server queuing system, Characterizing Systems,Simulation Diagrams.

UNIT-II
Stochastic generators Uniformly Distributed Random Numbers, Statistical properties of[0,1] generators, Generation of Non-uniform and Arbitary Random variates, Random processes, Characterizing and generating random process, White Noise. MODELING TIME DRIVEN SYSTEMS: Modeling input signals, delays, System integration, Linear Systems, Motion control models, Numerical Experimentation. EXOGENOUS SIGNALS AND EVENTS: Disturbance signals,State Machines, PetriNets & Analysis, System encapsulation.

UNIT-III
Markov Processes Probabilistic systems, Discrete Time Markov processes, Random walks, Poisson processes, the exponential distribution, simulating a poison process, Continuous-Time Markov processes.EVENT DRIVEN MODELS: Simulation diagrams, Queuing theory, simulating queuing systems, Finite Capacity Queues,Multiple Servers, M/M/C Queues.

UNIT-IV
System Optimization System Identification, Searches, Alpha/beta trackers, Multidimensional Optimization, Modeling and Simulation methodology.

UNIT-V
Simulation Software and Building Simulation ModelsComparisonof simulation packages with Programming languages, Classification of Software, Desirable Software features, General purpose simulation packages–Arena,Extend Guidelines for determining levels of model detail,Techniques for increasing model validity and credibility.

Text Books

1. System Modeling & Simulation, An Introduction–FrankL.Severance,John Wiley & Sons, 2001.

2. Simulation Modeling and Analysis–Averill M.Law, W. David Kelton, TMH, 3rd Edition, 2003.

Reference Books

1. Systems Simulation– Geoffery Gordon, PHI, 1978.

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (ECE) **II Semester**

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Introduction: The introduction of the English Language Lab is considered essential at 3rd Year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalized context.

The proposed course should be an integrated theory and lab course to enable students to use'good' English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project / research reports/ technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

Objectives

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

- Further, they would be required to communicate their ideas relevantly and coherently in writing.

Syllabus

The following course content is prescribed for the Advanced Communication Skills Lab:

- Functional English- starting a conversation–responding appropriately and relevantly–using the right bodylanguage–role play in different situations, Discourse Skills.

- Vocabulary Building–synonyms and antonyms,word roots, one - word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases, Collocations.

- Reading Comprehension –reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, Critical reading.

- Writing Skills–structure and presentation of different types of writing–Resume writing.

- E-correspondence / Technica l report writing/Portfolio writing–planningfor writing – research abilities/ data collection/ organizing data/ tools /analysis– improving one'swriting.

- GroupDiscussion –dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Presentation Skills–Oral presentations (individual and group) through JAM sessions / seminars and written presentations through posters /projects / reports / PPTs / e-mails / assignmentsetc.

- Interview Skills–concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.

Minimum Requirement

The English Language Lab shall have two parts

i) The Computer aided Language Lab for 60 students with 60 systems,one master console,LAN facility and English language software for self-study by learners.

ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T.V.,a digital stereo–audio & video system and camcorder etc.

System Requirement (Hardware component): Computer network with LAN with minimum 60 multimedia systems with the following specifications:

i) P–IV Processor
   a) Speed–2.8GHZ
   b) RAM–512 MB Minimum
   c) Hard Disk–80GB

ii) Head phones of High quality

Suggested Software

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software

- Clarity Pronunciation Power–partII
- Oxford Advanced Learner's Compass,7th Edition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech

TOEFL & GRE (KAPLAN, AARCO & BARRONS,USA, Cracking GRE by CLIFFS)

- The following software from'train 2 success.com'
- Preparing for being Interviewed,
- Positive Thinking,
- Interviewing Skills,

- Telephone Skills,
- Time Management
- Team Building,
- Decision making

- English in Mind, Herbert Puchta and Jeff Stranks with MeredithL evy, Cambridge

Books Recommended

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.

2. Advanced Communication Skills Laboratory Manual by SudhaRani, D, Pearson Education 2011.

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III B.Tech (ECE) **II Semester**

DIGITAL SIGNAL PROCESSING LAB

The Programs shall be implemented in Software (Using MATLAB / LabView / C Programming/ Equivalent) and Hardware (UsingTI/Analog Devices/ Motorola/ Equivalent DSP processors).

Experiments Based on MATLAB / Lab View / C Programming Equivalent

1. Generation of Sinusoidal waveform /signal based on recursive difference equations
2. Linear and circular convolutions and DFT
3. To find frequency response of a given system given in (Transfer Function/ Differential equation form)(Frequency response of analog Butter worth filter)
4. Implementation of DFT, inverse DFT and FFT of given sequence
5. Determination of Power Spectrum of a given signal(s).
6. Implementation of LPFIR filter for agiven sequence (Frequency response and time-domain simulation of FIR filter (1))
7 Implementation of HP FIR filter for agivens equence
8. Implementation of LP IIR filter for a given sequence (First order II R filter (LP): Frequency-response and time-domain simulation)
9. Implementation of HP IIR filter for a given sequence First order IIR filter (HP): Frequency-response and time-domain simulation
10. Generation (Recovery) of Sinusoidal signal through filtering
11. Generation of DTMF signals
12. Implementation of Decimation Process
13. Implementation of Interpolation Process
14. Implementation of I/D sampling rate converters
15. Impulseresponse of first order and second order systems.

Experiments Based On DSPP rocessor

1. Generation of Sine wave with Buffer
2. Generation of Sum of sinusoidal signals
3. Linear Convolution of Two Signal sequences
4. Circular Convolution of Two signal sequences
5. Dot Product of Two Sequences
6. Square and Sawtooth wave generation
7. DFT of a sequence
8. IDFTof a sequence
9. Low pass and High Pass IIR filter design
10. Low pass and High Pass FIR filter design

Note: Aminimum of 12 experiments, choosing 04 (Six) from experiments based on DSP Processor to be performed and recorded by the candidate to attain eligibility for Practical Examination.

IV-Year

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

CELLULAR AND MOBILE COMMUNICATIONS

UNIT-I

Introduction to Cellular Mobile Radio Systems: Limitations of Conventional Mobile Telephone Systems, Basic Cellular Mobile System, First, Second, Third and Fourth Generation Cellular Wireless Systems.

Fundamentals of Cellular Radio System Design: Concept of Frequency Reuse, Co-Channel Interference, Co-Channel Interference Reduction Factor, Desired C/I From a Normal Caseina Omni Directional Antenna System, System Capacity, Trunking and Grade of Service, Improving Coverage and Capacity in Cellular Systems- Cell Splitting, Sectoring, Micro cell Zone Concept.

UNIT-II

Co-Channel Interference Measurement Of Real Time Co-Channel Interference, Design of Antenna System, Antenna Parameters and Their Effects, Diversity Techniques-Space Diversity, Polarization Diversity, Frequency Diversity, Time Diversity.

Non-Co- ChannelInterference: Adjacent Channel Interference, Near End Far End Interference, CrossTalk, Effects on Coverage and Interference by Power Decrease, Antenna Height Decrease, Effects of Cell Site Components.

UNIT-III

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, Nearand Long Distance Propagation, Path Loss From a Point to Point Prediction Model in Different Conditions, Merits of Lee Model.

UNIT-IV

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-V

Handoffs and Dropped Calls Hand off Initiation, Types of Handoff, Delaying

Handoff, Advantages of Handoff, Power Difference Hand off, Forced Handoff, Mobile Assisted and Soft Handoff, Intersystem Handoff, Introduction to Dropped Call Rates and their Evaluation.

Text Books

1. Wireless Communications-Theodore.S. Rapport, Pearson education, 2nd Edn., 2002.

Reference Books

1. Principles of Mobile Communications– Gordon L.Stuber, Springer International, 2nd Edn.,2001.

2. Modern Wireless Communications- Simon Haykin, Michael Moher, Pearson Eduction, 2005.

3. Mobile Cellular Telecommunications–W.C.Y. Lee, Mc Graw Hill, 2nd Edn., 1989.

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IV B.Tech (ECE) **I Semester**

MICROWAVE ENGINEERING

UNIT-I
Microwave Transmission Lines Introduction, Microwave Spectrum and Bands, Applications of Microwaves. Rectangular Waveguides – Solution of Wave Equations in Rectangular Coordinates, TE/TM mode analysis, Expressions for Fields, Characteristic Equation and Cut-off Frequencies, Filter Characteristics, Dominant and Degenerate Modes, Sketches of TE and TM mode fields in the cross-section, Mode Characteristics–Phase and Group Velocities,Wave lengths and Impedance Relations.

Rectangular Guides-PowerTransmission and Power Losses, Impossibility of TEM Mode, Micro strip Lines–Introduction,Z Relations, Effective Dielectric Constant, Losses, Q factor, slot and Horn antennas.

UNIT-II
Cavity Resonators Introduction, Rectangular Cavities, Dominant Modes and Resonant Frequencies, Q Factor and Coupling Coefficients, introduction to micro strip antennas.

Waveguide Components and Applications: Coupling Mechanisms–Probe, Loop, Aperture types. Waveguide Discontinuities–Waveguide Windows, Tuning Screws and Posts, Matched Loads. Waveguide Attenuator Types, Resistive Card and Rotary Vane Attenuators; Waveguide Phase Shifters–Types, Dielectric and Rotary Vane Phase Shifters, Waveguide Multiport Junctions–Eplane and H plane Tees , MagicTee. Directional Couplers–2 Hole, Bethe Holetypes, Ferrites–Composition and Characteristics, Faraday Rotation, Ferrite Components–Gyrator, Isolator, Circulator.

UNIT-III
Microwave Tubes Limitations and Losses of conventional Tube sat Microwave Frequencies, Microwave Tubes–O Type and M Type Classifications, O-type Tubes:2 Cavity Klystrons–Structure,Reentrant Cavities, Velocity Modulation Process and Applegate Diagram, Bunching Process and Small Signal Theory–Expressions for O/PPower and Efficiency. Reflex Klystrons – Structure, Velocity Modulation and Applegate Diagram, Mathematical Theory of Bunching, Power Output, Efficiency, Oscillating Modes and O/P Characteristics, Effect of Repeller Voltage on Power O/P, Illustrative Problems.

Helix TTS: Significance,Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process (qualitative treatment),Suppression of Oscillations, Gain Considerations.

UNIT-IV

M-Type Tubes Introduction, Cross-field Effects, Magnetrons– Different Types,Cylindrical Traveling WaveMagnetron– Hull Cut-off and Hartree Conditions, Modes of Resonance and PI-Mode Operation, Separation of PI-Mode, o/p characteristics, Illustrative Problems

Microwave SolidState Devices: Introduction, Classification, Applications.TEDs –Introduction, GunnDiodes– Principle,RWH Theory, Characteristics,Basic Modes of Operation- Gunn Oscillation Modes, LSA Mode,Introduction to Avalanche Transit Time Devices.

UNIT-V

Microwave Measurements: Scattering Matrix–Significance, Formulation and Properties, S Matrix Calculations for – 2 port Junctions, E plane and H plane Tees, Magic Tee, Circulator and Isolator, Illustrative Problems.

Description of Microwave Bench–Different Blocks and their Features, Errors and Precautions, Microwave Power Measurement, Bolometers Measurement of Attenuation, Frequency Standing Wave Measurements–Measurement of Low and High VSWR, Cavity Q, Impedance Measurements.

Text Books

1. Microwave Devices and Circuits–Samuel Y. Liao, Pearson, 3rd Edition, 2003.

2. Microwave Principles–Herbert J.Reich, J.G.Skalnik, P.F.Ordung and H.L. Krauss, CBS Publishers and Distributors, New Delhi, 2004.

Reference Books

1. Foundations for Microwave Engineering–R.E.Collin,IEEE Press, John Wiley, 2nd Edition, 2002.

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IV B.Tech (ECE) **I Semester**

OPTICAL COMMUNICATIONS

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,Vnumber,Mode Coupling, StepIndex Fibers,Graded Index Fibers.

Single Mode Fibers-Cut Off Wavelength,Mode Field Diameter, Effective Refractive Index,Fiber Materials Glass, Halide, Active Glass,Chalgenide Glass, Plastic Optical Fibers.

UNIT-II

Signal Distortionin 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, Optical Fiber Connectors-Connector Types, Single Mode Fiber Connectors, Connector Return Loss.

UNIT-III

Fiber Splicing: Splicing Techniques, Splicing Single Mode Fibers, Fiber Alignment and Joint Loss - Multimode Fiber Joints, Single Mode Fiber Joints, Optical Sources- LEDs, Structures, Materials, Quantum Efficiency, Power, Modulation, Power Bandwidth Product, Injection Laser Diodes- Modes Threshold Conditions,ExternalQuantumEfficiency,LaserDiodeRateEquations,ResonantFrequencies, Reliability of LED&ILD.

Sourceto Fiber Power Launching: Output Patterns, Power Coupling, Power Launching, Equilibrium Numerical Aperture, Laser Diodeto Fiber Coupling.

UNIT-IV

Optical Detectors: Physical Principles of PIN and APD, Detector Response Time, Temperature Effecton Avalanche Gain, Comparison of Photo Detectors,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 Codingin Optical Links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye Pattern.

Text Books

1. Optical Fiber Communications–Gerd Keiser, TMH,4th Edition,2008.

2. Optical Fiber Communications–John M.Senior,Pearson Education,3rd Edition,2009.

Reference Books

1. Fiber Optic Communications–D.K. Mynbaev,S.C.Gupta and Lowell L. Scheiner, Pearson Education,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 Ediition, 2004.

4. Introduction to Fiber Optics by Donald J.Sterling Jr.–Cengage learning, 2004.

5. Optical Communication Systems–John Gowar,2nd Edition,PHI, 2001.

GOKARAJU RANGARAJU
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IV B.Tech (ECE) **I Semester**

DIGITAL DESIGN THROUGH VERILOG HDL

UNIT-I

Introductionto Verilog HDL: Verilogas HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Function Verification, System Tasks, Programming Language Interface, Module, Simulation and Synthesis Tools

Language Constructs and Conventions: Introduction, Keywords, Identifiers, White Space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data Types, Scalars and Vectors, Parameters, Operators.

UNIT-II

Gate Level Modeling: Introduction, AND Gate Primitive, Module Structure,Other Gate Primitives, Illustrative Examples,Tristate Gates, Array of Instances of Primitives, Design of Flip –Flops with Gate Primitives, Delays, Strengths and Construction Resolution, Net Types,Design of Basic Circuit.

Modeling at Data flow Level: Introduction, Continuous Assignment Structure, Delays and Continuous Assignments, Assignment to Vectors, Operators.

UNIT-III

Behavioral Modeling: Introduction, Operations and Assignments, Functional Bifurcation,‘ Initial’ Construct,‘Always’Construct, Assignments with Delays, ‘Wait’Construct, Multiple Always Block, Designsat Behavioral Level, Blocking and Non-Blocking Assignments, The ‘Case’ Statement, Simulation Flow‘If’ an ‘If-Else’Constructs, ‘Assign-De-Assign’Construct, ‘Repeat’ Construct,for Loop, ‘The Disable’ Construct, ‘While Loop’, For Ever Loop, Parallel Blocks, ‘Force-Release, Construct, Event.

UNIT-IV

Switch Level Modeling: Basic Transist or Switches, CMOS Switches, Bi Directional Gates, Time Delays With Switch Primitives, Instantiation with‘Strengths’and ‘Delays’, Strength Contention with Trireg Nets.

System Tasks, Functions and Compiler Directives: Parameters, Path Delays, Module Parameters, System Tasks and Functions, File BasedTasks and Functions, Computer Directives, Hierarchical Access, User Defined Primitives.

UNIT-V

Sequential Circuit Description: Sequential Models–Feedback Model, Capacitive Model, Implicit Model, Basic Memory Components, Functional Register, Static Machine Coding, Sequential Synthesis

Component Test and Verification: Test Bench-Combinational Circuit Testing, Sequential Circuit Testing, Test Bench Techniques, Design Verification, Assertion Verification.

Text Books

1. T R. Padmanabhan, B Bala Tripura Sundari, Design ThroughVerilog HDL, Wiley, 2009.

2. Zainalabdien Navabi, Verilog Digital System Design, TMH, 2ndEdition.

Reference Books

1. Fundamentls of Digital Logic with Veilog Design by Stephen Brown, Zvonkoc Vranesic, TMH,2nd Edition, 2010.

2. Digital Logic Designusing Verilog, State Machine & Synthesis for FPGA, Sunggu Lee, Cengage Learning, 2009

3. Verilog HDL-Samir Palnitkar, 2nd Edition, Pearson Education,2009.

4. Advanced Digital Design with the Verilog HDL– MichelD.Ciletti

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

TELEVISION AND RADAR ENGINEERING

UNIT-I
Introduction: T V Transmitter and Receivers, Synchronization, Aspect Ratio, Interlaced Scanning, Picture Resolution, T V Standards.

CameraTubes: Vidicon, Silicon Diode ArrayVidicon, Comparison of Camera Tubes, Monochrome TV Camera,

TV Signal Transmission and Propagation: Picture Signal Transmission, Positive and Negative Modulation, VSB Transmission, Sound Signal Transmission, Standard Channel BW.

UNIT-II
Monochrome T V Receiver: RF Tuner,IF Subsystem,Video Amplifier,Sound Section, SyncSeparation and Processing, AGC,Noise Cancellation,Video and Inter Carrier Sound Signal Detection, Vision IFSub system of Black and White Receivers.

UNIT-III
Color Television: Colour Signal Generation, Additive Colour Mixing,Video Signals for Colours, Colour Difference Signals, Perception of Brightness and Colours Luminance Signal, Encoding of Colour Difference Signals, Formation of Chrominance Signals, Color Cameras, Colour Picture Tubes.

Color Receiver: Introduction to Colour Receiver, Electron Tuners, IF Subsystem, Y- Signal Channel, Chroma Decoder, Separation of U&VColor.

UNIT-IV
Basics of Radar: Introduction, Maximum Unambiguous Range, Simple Form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications, Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise.

Radar Equation: SNR, Envelope Detector–False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (Simple Targets-Sphere, Cone-Sphere), Transmitter Power, PRF and Range Ambiguities.

UNIT-V

CW And Frequency Modulated Radar: Doppler Effect, CW Radar–Block Diagram, Isolation betweenTransmitter and Receiver, Applications of CW Radar, FM-CW Radar, Range and Doppler Measurement, Block Diagram and Characteristics.

MTI and Pulse Doppler Radar: Introduction, Principle, MTI Radar with-Power Amplifier Transmitter, Delay Line Cancellers–Blind Speeds, Double Cancellation, Staggered Prfs.MTI Radar Parameters, Limitations to MTI Performance

Text Books

1. Television and Video Engineering-A.M.Dhake, 2ndEdition.

2. Modern Television Practice–Principles, Technology and Service-R.R.Gulati, NewAge International Publication, 2002.

3. Introduction to Radar Systems–MerrillI.Skolnik, TMH Special Indian Edition, 2nd Ed.,2007.

Reference Books

1. Colour Television Theory and Practice-S.P.Bali, TMH, 1994.

2. Basic Television and Video Systems-B.Grob and C.E.Herndon, McGraw Hill, 1999.

3. Introduction to Radar Systems–MerrillI.Skolnik, 3rd ed., TMH,2001.

4. Radar: Principles, Technology, Applications–Byron Edde, Pearson Education, 2004.

5. Radar Principles–Peebles, Jr.,P.Z.,Wiley,NewYork,1998.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

TELECOMMUNICATION SWITCHING SYSTEMS

UNIT-I

Switching Systems: Evolution of Telecommunications; Basics of a Switching System; Functions of a Switching System; Crossbar Switching-Principle of Crossbar Switching; Crossbar Switch Configurations; Cross-Point Technology; Crossbar Exchange Organization; A General Trunking; Electronic Switching; Digital Switching Systems.

Telecommunications Traffic: Introduction; The Unit of Traffic; Congestion; Traffic Measurement; A Mathematical Model; Lost-Call Systems-Theory; Traffic Performance; Loss Systems in Tandem; Use of Traffic Tables; Queuing Systems-The Second Erlang Distribution; Probability of Delay; Finite Queue Capacity; Some Other Useful Results; Systems with a Single Server; Queuesin Tandem; Delay Tables; Applications of Delay Formulae.

UNIT-II

Switching Networks: Single Stage Networks; Gradings - Principle; Two Stage Networks; Three Stage Networks; Four Stage Networks

Time Division Switching: Basic Time Division Space Switching; Basic Time Division Time Switching; Time Multiplexed Space Switching; Time Multiplexed Time Switching; Combination Switching; Three Stage Combination Switching.

Control of Switching Systems: Call Processing Functions-Sequence of Operations; Signal Exchanges; State Transition Diagrams; Common Control; Reliability; Availability and Security; Stored Program Control.

UNIT-III

Signaling: Introduction; Customer Line Signaling; Audio Frequency Junctions and Trunk Circuits; FDM Carrier Systems-Out band Signaling; In band (VF) Signaling; PCM Signaling; Inter Register Signaling; Common Channel Signaling Principles - General Signaling Networks;CCITT Signaling System Number 6;CCITT Signaling System Number 7; The High Level Data Link Control Protocol; Signal Units; The Signaling Information Field.

UNIT-IV

Packet Switching: Introduction; Statistical Multiplexing; Local Area And Wide Area Networks-Bus Networks; Ring Networks; Comparison of Bus and Ring

Networks; Optical Fiber Networks; Large Scale Networks-General;Datagrams and Virtual Circuits; Routing; Flow Control; Standards; Frame Relay; Broad band Networks - General; The Asynchronous Transfer Mode; ATM Switches.

UNIT-V

Networks: Introduction; Analog Networks; Integrated Digital Networks; Integrated Services Digital Networks; Cellular Radio Networks; Intelligent Networks; Private Networks; Charging; RoutingGeneral, Automatic Alternative Routing.

Text Books

1. J.EFlood, "Telecommunications Switching and Traffic Networks," Pearson Education, 2006.

2. Tyagarajan Viswanathan,"Telecommunications Switching Systems and Networks," Prentice Hall of India Pvt. Ltd., 2006.

Reference Books

1. JohnC Bellamy,"DigitalTelephony,"John Wiley International Student Edition, 3rd Edition, 2000.

2. Behrouz A. Forouzan, "Data Communications and Networking,"TMH, 2nd Edition, 2002.

3. Tomasi,"Introduonction to Data Communication and Networking,"Pearson Education, 1st Edition, 2007.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

POWER ELECTRONICS

UNIT-I
Power Semi Conductor Devices and Commutation Circuits:
Thyristors – Silicon Controlled Rectifiers (SCR's)–BJT–Power MOSFET–Power IGBT and Their Characteristics and Other Thyristors – Basic Theory of Operation of SCR – Static Characteristics–Turn On and Turn Off Methods-Dynamic Characteristics of SCR -Turn On and Turn Off Times-Salient Points.TwoTransistor Analogy of SCR–R, RC, UJT Firing Circuits– Series and Parallel Connections of SCR's – Snubber Circuit Details – Specifications and Ratings of SCR's,BJT, IGBT - Numerical Problems–Line Commutation and Forced Commutation Circuits.

UNIT-II
Single Phase Half Wave Controlled Converters: Phase Control Technique–Single Phase Line Commutated Converters–Half Wave Controlled Converters with Resistive, RL Load and RLE Load–Derivation of Average Load Voltage and Current-Active and Reactive Power Inputs to the Converter swith out and with Free Wheeling Diode–Numerical Problems

Single Phase Fully Controlled Converters: Fully Controlled Converters,Mid Pointand Bridge Connections with Resistive, RL Loads and RLE Load–Derivation of Average Load Voltage and Current–Line Commutated Inverters, Semi - Converters, Active and Reactive Power Inputs to the Converters, Effect of Source Inductance–Expressions of LoadVoltage and Current–Numerical Problems.

Three Phase Line Commutated Converters: Three Phase Converters– Three Pulse and Six Pulse Converters and Bridge Connections with R, RL Load Voltage and Current with R and RL Load and RLE Loads – Semi Converters,Effect of Source Inductance–Dual Converters Waveforms–Numerical Problems.

UNIT-III
AC Voltage Controllers & Cyclo Converters: AC Voltage Controllers–Single Phase Two SCR'sin Anti Parallel with R and RL Loads, Modes of Operation of Triac–Triac with R and RL Loads–Derivation of RMS Load Voltage,Current and Power Factor-Wave Forms,Numerical Problems,Cyclo Converters–Single Phase Mid Point Cyclo Converters with Resistive and Inductive Load (Principle of Operation Only)–Bridge Configuration of Single Phase Cyclo Converter (Principle of Operation only)– Waveforms.

UNIT-IV

Choppers: Choppers–Time Ratio Control and Current Limit Control Strategies –Step Down Choppers-Derivation of Load Voltage and Currents with R, RL And RLE Loads-Step Up Chopper–Load Voltage Expression. Morgan's Chopper–Jones Chopper - Oscillation Choppers (Principle of Operation only) - Waveforms —AC Chopper– Problems.

UNIT-V

Inverters: Inverters–Single Phase Inverter–Basic Series Inverter, Parallel Capacitor Inverter, Bridge Inverter– Waveforms, Simple Bridge Inverters–Modified Mc Murray and McMurray–Bedford Inverters, Voltage Control Techniques for Inverters-Pulse Width Modulation Techniques–Numerical Problems.

Text Books

1. P.S.Bhimbra,"Power Electronics",Khanna Publications.

2. M.D.Singh & K.B.Kanchandhani, Power Electronics, Tata McGraw–Hill Publishing Company, 1998.

3. M.H.Rashid, PowerElectronics: Circuits, Devices and Applications– Prentice Hall of India,2nd Edition,1998

Reference Books

1. Vedam Subramanyam, Power Electronics – by NewAge International (P) Limited, Publishers

2. V.R.Moorthi, PowerElectronics–by 1st Edition-2005, OXFORD University Press.

3. P.C.Sen, Power Electronics, Tata McGraw-HillPublishing. PublishingCompany, 1998.

4. M.H.Rashid, Power Electronics: Circuits, Devices and Applications– Prentice Hall of India,2nd Edition,1998

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

INFORMATION THEORY AND CODING

UNIT-I
Introduction to Information Theory: Measure of information-Entropy of symbols-Continuous and discrete cases, Conditional entropies-Basic relationship among different entropies-Mutualin formation and Transinformation, Redundancy and Efficiency.

UNIT-II
Channel Classification and Capacity: Continuous and discrete communication channels-Discrete memory less channels-Channel representations- noiseless channel, lossless channel, deterministic, Binary Symmetric channel, Binary Erasure channel and their capacities - Continuous and discrete channels with noise-Shannon Hartley theorem and its implications.

UNIT-III
Detection of Signals and Channels with Noise: Hypothesis testing-Baye's criterion-Minimum error probability criterion, Neyman pearson criterion, Min-maxcriterion - Maximum likelihood detector-Wienerfilter.

UNIT-IV
Source Coding: Purpose of encoding-Uniquely decipherable codes-Code efficiency and redundancy, Shannon's first and second fundamental theorem, Shannon's encoding algorithm, Shannon Fano code,Huffman code

UNIT-V
Error Correcting Codes: Linear block codes, cyclic codes- Hamming, Block codes, BCH and RS codes, Convolutional codes-Viterbialgorithm, Concatenated codes,Trellis code modulation, Turbo codes-coding,decoding and performance, LDPC codes- construction and decoding

Text Books

1. Das, S.K.Mullick and P.K.Chatterjee,"Principles of Digital Communication", Wiley Eastern Limited,1986.

Reference Books

1. K.Sam Shanmugam,“Digital and Analog Communication Systems”,John Wiley and Sons, 1985.

2. Simon Haykin,“Communication Systems”,JohnWiley and Sons,Fourth Edition.

3. A.J.Viterbi and J.K.Omura,“Principles of Digital Communication and Coding”, McGrawHill.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

WIRELESS COMMUNICATION NETWORKS

UNIT-I

Introduction to Wireless Communication Systems: Evolution of Mobile Radio Communications, Examples of Wireless Communication Systems, Paging Systems, Cordless Telephone Systems, Comparison of Various Wireless Systems.

Modern Wireless Communication Systems: Second Generation Cellular Networks, Third Generation Wireless Networks, Wireless in Local Loop, Wireless Local Area Networks, BlueTooth and Personal Area Networks.

UNIT-II

Cellular System Design Fundamentals: Spectrum Allocation, Basic Cellular System, Frequency Reuse, Channel Assignment Strategies, Hand off Strategies, Interference and System Capacity, Trunking and Grade off Service, Improving Coverage and Capacity,Cell Splitting.

Multiple Access Techniques for Wireless Communication: Introduction to Multiple Access, FDMA,TDMA, Spread Spectrum Multiple Access, Space Division Multiple Access, Packet Radio, Capacity of a Cellular Systems.

UNIT-III

Wireless Networking: Difference Between Wireless and Fixed Telephone Networks, Development of Wireless Networks, Fixed Network Transmission Hierarchy, Traffic Routing in Wireless Networks, Wireless Data Services, Common Channel Signaling.

UNIT-IV

Wireless WAN: Mechanism to Support a Mobile Environment, Communication in the Infrastructure, IS-95 CDMA Forward Channel, IS – 95 CDMA Reverse Channel, Packet And Frame Formats in IS – 95,IMT –2000, Forward Channel in W-CDMA And CDMA2000, Reverse Channels inW-CDMA And CDMA-2000, GPR Sand Higher Data Rates.

Wireless LAN: Wireless Home Networking, IEEE 802.11.The PHY Layer, MAC Layer, HYPERLAN, HYPERLAN–2.

UNIT-V

Orthogonal Frequency Division Multiplexing: Basic Principles of Orthogonality, Single versus Multi Channel Systems, OFDM Block Diagram and its Explanation, OFDM Signal Mathematical Representation.

Text Books

1. The odoreS.Rappaport,"Wireless Communications and Appliction",Pearson Education- 2003.

2. Kaveh Pahlavan, Prashant Krishnamoorthy, "Principles of Wireless Networks, -A United Approach", Pearson Education, 2002.

Reference Books

1. P.Nicopolitidis, M.S.Obaidat, G.I.papadimitria, A.S.Pomportsis,"Wireless Networks",John Wiley & Sons,2003.

2. X.Wang and H.V.Poor,"Wireless Communication Systems,"Pearson education, 2004.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

ELECTRONIC MEASUREMENTS & DATA ACQUISITION

UNIT-I
Measurement and error; Definitions, Accuracy and precision, Types of errors, Statistical analysis, Probability of errors, Limiting Errors.

Direct Current Indicating Instruments: DC ammeters, DC voltmeters, Seriestype ohmmeter, Shuntty peohmmeter, Multimeter, Calibration of DC Instruments.

DC & AC Bridges: Wheat stone, Kelvin, Guarded Wheatstone, Maxwell,Hay, Schering and Wein bridges, Wagner ground connection.

UNIT-II
Electronic Instruments for Measuring Parameters: AC voltmeters using rectifiers, True RMS responding voltmeter, Electronic multimeter, Digital voltmeters: Ramp, Stair case ramp, Integrating, Successive approximation, Quantizing error; Frequency counter, Universal counter. Storage and sampling oscilloscopes, Digital storage oscilloscope, Spectrum analyzer.

UNIT-III
Transducers1: Introduction,Classification of transducers, Analog transducers,Resistive transducers, Potentiometers, Straingauges, Types of straingauges, Resistance strain gauges, Semiconductor strain gauges, Resistance thermometers, Thermistors, Application of Thermistors, Thermo couple construction, Measurement of thermocouple output,Compensating circuits, Advantages and disadvantages of thermo couples,

UNIT-IV
Transducers 2: Variable inductance type transducer, Variation of self inductance, Variation of mutual inductance, Linear variable differential transformer, Rotary variable differential transformer, Capacitive transducers, Piezo-electric transducers, Digital transducers, Shaft Encoder.

UNIT-V
Data Acquisition Systems Digital Data Acquisition System, Various ways of multiplexing, Computer controlled instrumentation.

Text Books

1. WDCooper & AD Helfrick, Electronic Instrumentation and Measurement Techniques, PHI, 1998

2. AK Sawhney, Electrical and Electronics Measurement and Instrumentation, Dhanpat Rai, 2000

Reference Books

1. CS Rangan, G R Sarmaand VSVMani, Instrumentation Devices and Systems, TMH, 1997

2. HS Kalsi, Electronic Instrumentation, TMH, 1995

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

VOICE OVER INTERNET PROTOCOL (VOIP)

UNIT-I
Overview of IPProtocol Suite The Internet Protocol, The Transmission Control Protocol (TCP), The User Datagram Protocol (UDP),The Real-time Transport Protocol(RTP),IP multicast, IP version6 (IPv6),Inter working IPv4 and IPv6,TheVoIPMarket,VoIP Challenges.

UNIT-II
H.323 and H.245 Standards: The H.323Architecture, Call Signaling-Call Scenarios, H.245 Control Signaling
Conference calls-The Decomposed Gateway.

UNIT-III
The Session Initiation Protocol(SIP): SIP architecture- Overview of SIP Messaging Syntax- Examples of SIP Message sequences- Redirect Servers-Proxy Servers. The Session Description Protocol (SDP)-Usage of SDP With SIP.

UNIT-IV
Quality of Service (QOS): Need for QOS End-to-end QoS, Overview of QOS solutions- The Resource reservation Protocol (RSVP)-Diffserv-The Diffserv Architecture-Multi-protocol Label Switching (MPLS)-The MPLS Architecture-MPLS Traffic Engineering- Label Distribution Protocols and Constraint-Based Routing.

UNIT-V
VoIP and Ss7: The SS7 Protocol Suite-The Message Transfer Part(MTP), ISDN User Part(ISUP) and Signaling Connection Control Part (SCCP),SS7 Network Architecture- Signaling Points(SPs)-Single Transfer Point(STP),-Service Control Point(SCP)- Message Signal Units (MSUs)-SS7Addressing,ISUP ,Performance Requirements for SS7,Sigtran-Sigtran Architecture-SCTP-M3UA Operation-M2UA Operation- M2PA Operation-Interworking SS7 and VoIP Architectures-Interworking Soft switch and SS7-Interworking H.323andSS7.

Text Books

1. Carrier Grade Voice over IP Daniel Collins,2nd ed.,TMH.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

ADVANCED COMMUNICATIONS LAB

Experiments Based on Communication

1. Modulation index by direct method
2. Modulation index by indirect method.
3. Sampling and its reconstruction.
4. DSB transmitter.
5. DSB receiver.
6. Sensitivity & selectivity.
7. Pre–emphasis and de–emphasis
8. FM modulation and Demodulation
9. Time division multiplexing and de-multiplexing

Experiments Based on Mobile Communication

1. Generation of base band signal for GSM, CDMA, Bluetooth, WLAN and Wi MAX. Estimation of the signal spectrum at base band.
2. Analyze the working of the RF section of a mobile cellular receiver.
3. Signal generation, reception and analysis of Bluetooth signal using random number as information bits.
4. Simulate the working of codec in a GSM receiver using MATLA Band Lab view.
5. Analyze propagation characteristics of GSM, IS95, CDMA 2000 using Qualnet simulator.

6. Determine the mobile channel transfer function using vector network analyzer, signal generatorand spectrum analyzer.

7. Test an error correction coding scheme using software defined radio system.

8. Design equalizer for GSM receiver on a software defined radio system.

9. Design a mobile CDMA receiver using software defined radio set.

Note: Aminimum of 12 experiments, choosing 6 from communication and 6 from mobile communication to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

EMBEDDED SYSTEM LAB

1. **Voltage Measurement**
   Design a voltmeter to measure voltage from 0 to 5 volts and display on 2 digits, 7 segment displays.

2. **Water Pump Controller**
   Design a water pump controller by sensing the low and high level in water tank.

3. **Digital Clock**
   Design a digital clock, using LCD display

4. **Temperature Measurement**
   Design a Thermometer, using LM35 and 2 digits, 7 segment displays

5. **PC Communication**
   Interface the micro controller to a PC through RS232 interface. Display messages sent by the micro controller on the PC using Visual Basic program running in PC

6. **Remote Control through FM Link**
   Establish a remote link between two micro controllers using FM transmitter and receiver. Exchange messages between the two micro controllers.

7. **Hot Chamber Controller**
   Design a hot chamber to maintain the temperature say at 40 degrees centigrade.

8. **Obstacle Detector through Ultra Sonic**
   Design a obstacle detection system using ultrasonic transmitter receiver.

9. **Sprinkler Controller**
   Design a moisture sensor and sprinkler controller

10. **Lamp Controller**
    Design a light sensor and a timer to control a lamp for 3, 4 or 8 hours.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **I Semester**

MICROWAVE AND OPTICAL COMMUNICATION LAB

Experiments Based on Microwave Engineering

1. Reflex Klystron Characteristics
2. Gunn Diode Characteristics
3. Directional Coupler Characteristics
4. VSWR Measurement
5. Measurement of Wave guide Parameters
6. Measuremen to fImpedance of a given Load
7. Measurement of scattering parameters of a MagicTee
8. Measurement of scattering parameters of a Circulator
9. Attenuation Measurement
10. Microwave Frequency Measurement
11. Determination of Characteristics of a Given Directional Coupler
12. Measurement of Gain of anAntenna

Experiments Based on Optical Communication

13. Characteristic of Light Sources / Detectors
14. Fiber Optics Cable: Numerical Aperture Measurement
15. Measurement of Coupling and Bending Losses of a Fiber
16. Analog Link Setup using a Fiber
17. Digital Link Setup using a Fiber
18. Setup of Time Division Multiplexing using Fiber Optics

Note: Aminimum of 12experiments**,** choosing 4(Four) from experiments based on optical communication to be performed and recorded by the candidate to attain eligibility for Practical Examination.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **II Semester**

DIGITAL IMAGE PROCESSING

UNIT-I
Introduction to Digital Image Fundamentals: Digital image processing system, Image processing applications and problems: Image representation and modeling, image enhancement, image restoration, image analysis, reconstruction, compression. Elements of visual perception. Image sampling and Quantization and their limitations, image perception.

UNIT-II
Mathematical Preliminaries and Image Transform: Two dimensional system and mathematical Preliminaries, Image transforms;1D DFT, 2D DFT, Discrete Cosine, transform, Discrete Sine transform, Hadamard transform, Haar transform, Slant transform,KLtransform,SVD transform,Wavelet transform.

UNIT-III
Image Enhancement and Restoration: Image Enhancement: Point operation, Spatial operation, Transform operation, Pseudo colouring, Image Restoration: Image restoration process, Noisemodels, Mean filters, Inverse filtering, Wiener filtering,Constrained least mean square filtering–Geometric transformation.

UNIT-IV
ColorImage Processing and Image Compression: ColorImage: Color fundamentals, Color models, HIS to RGB and RGB to HIS.Image Compression: Need for compression – Coding Redundancy, Interpixel Redundancy - Psycho visual Redundancy, Bit plane coding-Variable length coding, Adaptive coding, Arithmetic coding,LZW, Coding, Hybrid coding,Wavelet, JPEG, MPEG.

UNIT-V
Image Segmentation and Object Recognition: Segmentation: Edge detection, Gradient operator, Compass operator, Laplace operator and Zero crossing, stochastic gradient, Line and Spot detection. Edge linking and Boundary detection, Region based, segmentation. Object Recognition: Patterns and pattern classes, matching.

Text Books

1. R.C.Gonzalez,“Digital Image Processing”,AddisonWesley.

Reference Book

1. Pratt,“Digital Image Processing”,JohnWiley.
2. Anil K Jain,“Fundamentals of Digital Image Processing”,PHILearning,1999.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **II Semester**

COMPUTER NETWORKS

UNIT-I
Introduction: OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks, Arpanet, Internet, NetworkTopologies WAN,LAN,MAN. Physical Layer: Transmission media copper, twisted pair wireless,switching and encoding asynchronous communications; Narrow band, broad band ISDN and ATM

UNIT-II
Data link Layer: Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Slip, Data link layer in HDLC,Internet,ATM.Medium Access sublayer: ALOHA, MAC addresses,Carrier sense multiple access. IEEE 802.X Standard Ethernet, wireless LANS. Bridges

UNIT-III
Network Layer: Virtual circuit and Data gram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing. Dynamic routing – Broadcast routing.Rotary for mobility.Congestion, Control Algorithms – General Principles–of Congestion prevension policies. Internet working: The Network layer in the internet and in the ATM Networks.

UNIT-IV
Transport Layer: Transport Services, Connection management, TCP and UDP protocols; ATMAAL Layer Protocol.

UNIT-V
Application Layer–Network Security, Domain name system, SNMP, Electronic Mail; the World WEB, Multi Media.

Text Books

1. Computer Networks—AndrewS Tanenbaum, 4thEdition .Pearson Education/ PHI
2. Data Communications and Networking–BehrouzA.Forouzan.Third Edition TMH.

Reference Books

1. An Engineering Approach to Computer Networks-S.Keshav, 2ndEdition, Pearson Education

2. UnderstandingcommunicationsandNetworks,3rdEdition,W.A.Shay, Thomson

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **II Semester**

SATELLITE COMMUNICATION

UNIT-I
Orbital Aspects of Satellite Communication: Abrief history of Satellite Communications, Types of Orbits, Kepler's laws of planetary motion, locating the satellite in the orbit, locating the Satellite with respect to the Earth, Orbital elements, Look angle determination, Orbital perturbations, launch and launch vehicles, Orbital effects in Communication System performance.

UNIT-II
Space Craft: Introduction, Spacecraft Subsystems, attitude and Orbit Control system, Telemetry, tracking and command, Power Systems, Communication Subsystems, Spacecraft antennas.
Multiple Access Techniques

FDM / FM Satellite Systems,FDMA: SPADEDAMA Satellite System, TDMA CEPT primary Multiplex frame, CDMA: Encoder, decoder, Comparison between CDMA, FDMA & TDMA.

UNIT-III
Satellite Link Design: Basic transmission theory, System noise temperature and G / Tratio. Design of uplink and downlink models, Design of Satellitelinks for specified C / N ratio.

UNIT-IV
Earth Station Technology: Earth Station Design, Design of large antennas, tracking, small earth station Antennas, equipment for earth stations.VSAT, Satellite Broadcasting, Satellite TV system.

UNIT-V
Spread Spectrum Techniques: PN Sequences, Notion of Spread Spectrum, DSSS : DSSS with CBPSK, Processing gain, Probability of error, Acquisition and tracking, FHSS: Slow frequency hopping, Fast frequency hopping. Acquisition and tracking, Practical Jammer types,THSS

Text Books

1. TPrattandWBostiain, Satellite Communications, 2nd Edition, John Wiley, 2003.

2. WTomasi, Advanced Electronic Communication Systems, 4th Edition, Pearson Education, 2002.

Reference Books

1. DC Agarwal, Satellite Communications, Khanna Publishers, 2003.

2. Robert M Gagliardi, Satellite Communications.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **II Semester**

SEMICONDUCTOR MEMORY DESIGN & TESTING

UNIT-I
Random Access Memory Technologies: SRAM–SRAM Cell Structures, MOS SRAM Architecture, MOS SRAM Cell And Peripheral Circuit Operation, Bipolar SRAM Technologies,SOI Technology, Advanced SRAM Architectures and Technologies, Application Specific SRAMs, DRAM–DRAM Technology Development, CMOSDRAM, DRAM Cell Theory and Advanced Cell Structures, BICMOSDRAM, Soft Error Failure in DRAM, Advanced DRAM Design and Architecture, Application Specific DRAM

UNIT-II
Non-volatileMemories: Masked ROMs, High density ROM, PROM, Bipolar ROM, CMOSPROMS, EPROM, Floating Gate EPROM Cell, One Time Programmable EPROM, EEPROM, EEPROM Technology and Architecture, Non-Volatile SRAM, Flash Memories (EPROMOrEEPROM), Advanced Flash Memory Architecture

UNIT-III
Memory Fault Modeling Testing and Memory Design for Testability and Fault Tolerance: RAM Fault Modeling, Electrical Testing, Pseudo Random Testing, Megabit DRAM Testing, Non-Volatile Memory Modeling and Testing, IDDQ Fault Modeling and Testing, Application Specific Memory Testing,RAM Fault Modeling, BIST Techniques for Memory

UNIT-IV
Semiconductor Memory Reliability and Radiation Effects: General Reliability issues RAM Failure Modes and Mechanism, Non-Volatile Memory Reliability, Reliability Modeling and Failure Rate Prediction, Design for Reliability, Reliability Test Structures, Reliability Screening and Qualification, Radiation Effects, Single Event Phenomenon (SEP), Radiation Hardening Techniques, Radiation Hardening Process and Design Issues,Radiation Hardened Memory Characteristics, Radiation Hardness Assurance and Testing, Radiation Dosimetry,Water Level Radiation Testing and Test Structures

UNIT-V
Advanced Memory Technologies and High-Density Memory Packing Technologies: Ferro electric RAMs (FRAMs), GaAsFRAMs, Analog Memories, Magneto Resistive RAMs (MRAMs), Experimental Memory Devices, Memory

Hybrids and MCMs (2D), Memory Stacks and MCMs (3D),Memory MCM Testing and Reliability issues, Memory Cards, High Density Memory Packaging Future Directions

Text Books

1. Semiconductor Memories Technology – Ashok K.Sharma – Wiley, 2002

Reference Books

1. Advanced Semiconductor Memories – Architecture, Design and Applications - Ashok K.Sharma - Wiley, 2002

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **II Semester**

VIRTUAL INSTRUMENTATION

UNIT-I
Virtual Instrumentation: Historical perspectives, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, and comparison with conventional programming. Development of Virtual Instrument using GUI, Real-time systems, Embedded Controller, OPC, HMI / SCADA software, Active X programming.

UNIT-II
VI programming Techniques: VISand sub-VIS, loops and charts, arrays, clusters and graphs, case and sequence structures, form ulanodes, local and global variables, string and fileI/O, Instrument Drivers, Publishing measurement data in the web.

UNIT-III
Data acquisition basics: Introduction to data acquisition on PC, Sampling fundamentals,Input/output techniques and buses.ADC,DAC,Digital I/O,counters and timers, DMA, Software and hardware installation, Calibration, Resolution, Data acquisition interface requirements.

UNIT-IV
Chassis requirements. Common Instrument Interfaces: Current loop, RS 232C/ RS485, GPIB, Bus Interfaces: USB,PCMCIA,VXI,SCSI,PCI,PXI, Firewire.PXI system controllers,Ethernet control of PXI,Networking basics for office & Industrial applications, VISA and IVI.

UNIT-V
Toolsets, Distributed I/O modules. Application of Virtual Instrumentation: Instrument Control, Development of process database management system, Simulation of systems using VI,Development of Control system,Industrial Communication, Image acquisition and processing, Motion control.

Text Books

1. GaryJohnson, Lab VIEW Graphical Programming,Second edition,McGraw Hill, New york,1997.

2. Lisa K.wells & Jeffrey Travis, LabVIEW for everyone, Prentice Hall,New Jersey, 1997.

Reference Books

1. Kevin James, PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control, Newnes, 2000.

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IV B.Tech (ECE) **II Semester**

RF CIRCUIT DESIGN

UNIT-I

Introduction: Importance of RF Design-Dimensions and Units-Frequency Spectrum-RF Behaviour of Passive Components: High Frequency Resistors, High Frequency Capacitors, High Frequency Inductors.-Chip Components and Circuit Board Considerations: Chip Resistors, Chip Capacitors, and Surface Mount Inductors.

Review of Transmission Lines: Types of Transmission Lines-Equivalent Circuit representation-R, L,C, G parameters of Different Line configurations-Terminated Loss less Transmission Lines-Special Terminations : Short Circuit,Open Circuit and Quarter Wave Transmission Lines- Sourced and Loaded Transmission Lines: Power Considerations, Input Impedance Matching, Return Loss and Insertion Loss.

UNIT-II

Single and Multi-Port Networks: The Smith Chart: Reflection Coefficient, Normalized Impedance-Impedance Transformation: Standing wave Ratio,Special Transformation Conditions-Admittance Transformation-Parallel and Series RL & RC Connections-Basic Definitions of Single and Multi-Port Networks- Interconnecting Networks.

RF Filter Design: Scattering Parameters: Definition, Meaning, Chain Scattering Matrix, Conversion Between S- and Z-parameters, Signal Flow Chart Modeling, Generalization-Basic Resonator and Filter Configurations: Low Pass, High Pass, Band Pass and Band Stop type Filters-Filter Implementation using Unit Element and Kuroda's Identities Transformations- Coupled Filters.

UNIT-III

Active RF Component Modeling: RF Diode Models: Nonlinear and Linear Models-Transistor Models: Large Signal and Small Signal BJT Models, Large Signal and Small Signal FET Models- Scattering Parameter, Device Characterization.

UNIT-IV

Matching and Biasing Networks: Impedance MatchingUsing Discrete Components: Two Component Matching Networks, Forbidden Regions,

Frequency Response and Quality Factor, T and Pi Matching Networks-Amplifier Classes of Operation and Biasing Networks: Classes of Operation and Efficiency of Amplifiers, Biasing Networks for BJT, Biasing Networks for FET.

UNIT-V

RF Transistor Amplifier Design: Characteristics of Amplifiers-Amplifier Power Relations: RF Source, Transducer Power Gain, Additional Power Relations-Stability Considerations: Stability Circles, Unconditional Stability, And Stabilization Methods-Unilateral and Bilateral Design for Constant Gain-Noise Figure Circles- Constant VSWR Circles.

RF Oscillators and Mixers: Basic Oscillator Model: Negative Resistance Oscillator, Feedback Oscillator Design, Design steps, Quartz Oscillators-Fixed Frequency High Frequency Oscillator -Basic Characteristics of Mixers: Concepts, Frequency Domain Considerations, Single Ended Mixer Design, Single and Double Balanced Mixers.

Text Books

1. RFCircuitDesignTheory and Applications by Reinhold Ludwig, Pavel BsetchkoPearson Education India, 2000.

2. Radio Frequency and Microwave Communication CircuitsAnalysis and Design by Devendra K.MisraWiley Student EditionJohnWiley & Sons, Inc.

Reference Books

1. Radio Frequency and Microwave ElectronicsIllustrated by Matthew M.Radmanesh PEI.

2. RFCircuit DesignChristopher Bowick, Cheryl Aljuni and John Biyler, Elsevier Science,2008.

3. Secrets of RF Circuit Designby Joseph J.Carr, TMH, 2000.

4. Design of RF and Microwave Amplifiers and Oscillators, Peter L.D.Abrif, Artech House, 2000.

5. The Design of CMOS Radio Frequency Integrated Circuits by Thomas H. Lee, 2/eCambridge University Press, 2004.

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IV B.Tech (ECE) **II Semester**

SPEECH PROCESSING

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 LP Cequation 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 speechtrans form coding-channel vo Course Coder-formant vo Course Coder-cepstralvoCourse Coder-vector Quantizer Course Coder.

UNIT-IV
Speech synthesis - pitch extraction algorithms - gold rabiner pitch trackers auto correlation pitch trackers- voice/ unvoiced detection - homomorphic speech processing - homomorphic systems for convolution - complex cepstrums - pitch extract ion using homomorphic speech processing.

UNIT-V
Automatic speech recognition systems- isolated word recognition-connected word recognition-large vocabulary word recognition systems-pattern classification -DTW, HMMspeaker recognition systems-speaker verification systems-speaker identification systems.

Text Books

1. RabinerL.R. & SchaferR.W.,"Digital Processing of Speech Signals",PHI

2. Thomas Parsons,"Voice and Speech Processing",McGraw HillSeries.

Reference Books

1. OwensF.J.,"Signal Processing of Speech",Macmillan New Electronics.

2. Rabiner L.R. & Gold,"Theory and Applications of Digital Signal Processing", Prentice Hall of India.

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IV B.Tech (ECE) **II Semester**

SOFTWARE ENGINEERING

UNIT-I
Introduction to Software Engineering: The Evolving Role of Software, Changing Nature of Software, Software Myths.

A Generic View of Process: Software Engineering- A Layered Technology, A Process Frame work, The Capability Maturity Model Integration (CMMI), Process Patterns, Process Assessment, Personal and Team Process Models.

Process Models: The Water fall Model, Incremental Process Models, Evolutionary Process Models, The Unified Process.

UNIT-II
Software Requirements: Functional and Non-Functional Requirements, User Requirements, System Requirements, Interface Specification, The Software Requirements Document.

Requirements Engineering Process: Feasibility Studies, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management.

UNIT-III
System Models: Context Models, Behavioral Models, Data Models, Object Models, Structured Methods.

Design Engineering: Design Process and Design Quality, Design Concepts,The Design Model.

Creatingan Architectural Design: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design.

UNIT-IV
Object-Oriented Design: Objects and Object Classes, an Object-Oriented Design Process, Design Evolution.

Performing User Interface Design: Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

Risk Management: Reactive Vs Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, RMMM, RMMM Plan.

UNIT-V

Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability, The ISO9000 Quality Standards.

Metrics for Process and Products: Software Measurement, Metrics for Software Quality.

Product Metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

Testing Strategies: A Strategic Approach to Software Testing, Test Strategies for Conventional Software, Black-Box and White-BoxTesting, ValidationTesting, SystemTesting, the Art of Debugging.

Text Books

1. Software Engineering, A Practitioner's Approach-Roger S.Pressman,6th Edition. McGraw Hill International Edition.

2. Software Engineering-Sommerville, 7th Edition, Pearson Education.

Reference Books

1. Software Engineering-K.K.Agarwal & Yogesh Singh, New Age International Publishers

2. Software Engineering, An Engineering Approach-James F.Peters, Witold Pedrycz, John Wiely.

3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.

4. Software Engineering Principles and Practice-WamanS Jawadekar, The

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (ECE) **II Semester**

DIGITAL SIGNAL PROCESSORS AND ARCHITECTURE

UNIT-I

Introduction to Digital Signal Processing: Introduction, A digital signal-processing system, Thesmapling process, Discrete time sequences.Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), linear time-invarieant systems, Digital filters, Decimation and interpolation.

Computational Accuracyin DSP Implementatations: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementatons, 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 Executation, Speed Issues, Features for External interfacing.

UNIT-III

Programmable Digital Signal Processors: Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XXDSPs,Data Addressing modes of TMS320C54XXProcessors, Memory space of TMS320C54XX Processors, Program Control,TMS320C54XX instructions and Programming, On-Chip Peripherials, Interrupts of TMS320C54XX processors,Pipeline Operation of TMS320C54XXProcessors.

UNIT-IV

Analog Devices Family of DSP Devices: Analog Devices Family of DSP Devices-ALU and MAC bloc diagram, Shifter Instruction, Base Architecture of ADSP2100, ADSP-2181 high performace Processor. Introduction to Blackfin Processor-The Blackfin Processor, Introduction to Micro Signal Architecture,Overview of Hardware Processing Units and Register files, Address Arthimetic Unit,Control Unit,Bus Architecture and Memory,Basic Peripherals.

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

Text Books

1. Digital Signal Processing-Avtar Singh and S.srinivasan, Thomson Publication, 2004

2. A practical Approach to Digital Signal Processing–K Padmanabahan, R. Vijayarajeswaran, Ananthi.S, New Age International, 2006/2009

Reference Books

1. Embedded Signal Processing with the Micro signal Architeecture Publisher: Woon–Seng Gan, Sen M.Kuo, Wiley-IEEEPress,2007