COURSE STRUCTURE

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRONICS AND COMMUNICATION ENGINEERING

I YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	English – I	3	-	2
2	Mathematics - I	3	-	2
3	Engineering Physics – I	3	-	2
4	Engineering Chemistry I	3	-	2
5	C Programming	3	-	2
6	Environmental Studies	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	-	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring,)	-	3	2
9	C Programming Lab	-	3	2
10	English Proficiency Lab	-	3	2
	Total			**20**

I YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	English – II	3	-	2
2	Mathematics – II	3	-	2
3	Engineering Physics – II	3	-	2
4	Engineering Chemistry-- II	3	-	2
5	Engineering Drawing	3	-	2
6	Mathematical Methods	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -II	-	3	2
8	English - Communication Skills Lab	-	3	2
9	IT Workshop	-	3	2
	Total			**18**

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE STRUCTURE

II YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Managerial Economics and Financial Analysis	4	-	4
2	Electronic Devices and Circuits	4	-	4
3	Probability Theory & Stochastic Processes	4	-	4
4	Network Analysis	4	-	4
5	Signals & Systems	4	-	4
6	Electrical Technology	4	-	4
7	EDC Lab	-	3	2
8	Networks &Electrical Technology Lab	-	3	2
9	English Communication Practice	-	2	1
10	Professional Ethics & Morals-I	2	-	-
	Total			**29**

II YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Electronic Circuit Analysis	4	-	4
2	Control Systems	4	-	4
3	Pulse & Digital Circuits	4	-	4
4	Switching Theory & Logic Design	4	-	4
5	EM Waves and Transmission Lines	4	-	4
6	Analog Communications	4	-	4
7	Electronic Circuits & P D C Lab	-	3	2
8	Analog Communications Lab	-	3	2
9	English Communication Practice	-	2	1
10	Professional Ethics & Morals-II	2	-	-
	Total			**29**

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE STRUCTURE

III YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Linear IC Applications	4	-	4
2	Computer Architecture & Organization	4	-	4
3	Digital IC Applications	4	-	4
4	Digital Communications	4	-	4
5	Antennas and Wave Propagation	4	-	4
6	Electronic Measurements and Instrumentation	4	-	4
7	Digital Communications Lab	-	3	2
8	IC Applications Lab	-	3	2
9	I P R & Patents - I	2	-	-
	Total			**28**

III YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Computer Networks	4	-	4
2	Digital Signal Processing	4	-	4
3	VLSI Design	4	-	4
4	Microwave Engineering	4	-	4
5	Microprocessors and Microcontrollers	4	-	4
6	Management Science	4	-	4
7	Microprocessors and Microcontrollers Lab	-	3	2
8	Electronic Computer Aided Design Lab	-	3	2
9	I P R & Patents - II	2	-	-
	Total			**28**

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE STRUCTURE

IV YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Optical Communication	4	-	4
2	Embedded Systems	4	-	4
3	Digital Image Processing	4	-	4
4	Radar Systems	4	-	4
5	**Open Elective**	4	-	4
6	**Elective – I** 1. Telecommunication Switching Systems 2. Analog IC Design 3. Object Oriented Programming	4	-	4
7	Digital Signal Processing Lab	-	3	2
8	Microwave and Optical Communications Lab	-	3	2
	Total			**28**

IV YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Cellular and Mobile Communications	4	-	4
2	**Elective – II** 1. Network Security & Cryptography 2. Satellite Communications 3. Digital Control Systems	4	-	4
3	**Elective – III** 1. Operating Systems 2. Structured Digital Design 3. Wireless Sensor Networks	4	-	4
4	**Elective – IV** 1. Analytical Instrumentation 2. Real Time Operating Systems 3. TV Engineering	4	-	4
5	PROJECT			12
	Total			**28**

Open Electives:

1. Bio Medical Engineering
2. Image Processing
3. Signals & Communication Systems

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

COURSE STURUCTURE - R10

COMMON TO BRANCHES

(ECE, IT, ME, CHEM, BME, ECom E, PCE, MM)

I Year

	I Semester	P	C		II Semester	P	C
1	English – I	3	2	1	English – II	3	2
2	Mathematics - I	3+1	2	2	Mathematics – II	3+1	2
3	Engineering Physics – I	3+1	2	3	Engineering Physics – II	3+1	2
4	Engineering Chemistry I	3	2	4	Engineering Chemistry-- II	3	2
5	C Programming	3	2	5	Engineering Drawing	1+3	2
6	Environmental Studies	3	2	6	Mathematical Methods	3+1	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	3	2	7	Engineering Physics & Engineering Chemistry Laboratory -II	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring,)	3	2	8	English - Communication Skills Lab	3	2
9	C Programming Lab	3	2	9	IT Workshop	3	2
10	English Proficiency Lab	3	2				
		32	**20**			**31**	**18**

COURSE STURUCTURE - R10
COMMON TO BRANCHES

(CSE, EEE, CE, EIE, AE, BT, AME,)

I Year

	I Semester	P	C		II Semester	P	C
1	English – I	3	2	1	English – II	3	2
2	Mathematics - I	3+1	2	2	Mathematics – II	3+1	2
3	Engineering Physics – I	3+1	2	3	Engineering Physics – II	3+1	2
4	Engineering Chemistry I	3	2	4	Engineering Chemistry-- II	3	2
5	C Programming	3	2	5	Engineering Drawing	1+3	2
6	Mathematical Methods	3+1	2	6	Environmental Studies	3	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	3	2	7	Engineering Physics & Engineering Chemistry Laboratory -II	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring,)	3	2	8	English - Communication Skills Lab	3	2
9	C Programming Lab	3	2	9	IT Workshop	3	2
10	English Proficiency Lab	3	2				
		33	**20**			**30**	**18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
Syllabus effective from 2010-2011

ENGLISH SYLLABUS FOR SEM. 1 & 2 of JNTU-K

Introduction

The major challenge of a language teaching in a technical institution is to prepare the student for employability through imparting language skills to develop communicative competence. The proficiency in English language is closely linked to 'good communication skills' more so in the recent times when employability is at stake for want of communication skills on the part of the students. Since skills and personal attributes are revealed through communication, the responsibility of grooming students in life skills is also emphasized as part of language teaching and learning.

The core key skills needed are:

- Communication
- Team Work
- Problem Solving
- Learning Skills

The personal attributes to be groomed are:

- Adaptability
- Commitment
- Enthusiasm
- Stress Management
- Integrity
- Sense of Humour
- Self-Motivation
- Reliability
- Self-esteem
- Personal Presentation

Since the inception of the Board of Studies for English, effort to design a Course Structure that would cater to the needs of a wide range of learner groups has been made. It was felt by the Board that the Course Structure has to take into consideration the above criteria and therefore the objectives of the Language course ought to be much focused.

Objectives

1: To improve the language proficiency of technical under graduates in English with emphasis on LSRW skills.

1.1: To provide learning environment to practice *listening*, *speaking*, *reading*, and *writing* skills within and beyond the classroom environment.

1.2: To assist the students to carry on the tasks and activities through guided instructions and materials.

2: To effectively integrate English language learning with employability skills and training.

2.1: To design the main course material and exercises with authentic materials drawn from everyday use to cater to everyday needs.

The material may be culled from newspaper articles, advertisements, promotional material etc.

2.2: To provide hands-on experience through case-studies, mini-projects, group & individual presentations.

Each chapter will be structured with a short passage or collage of passages for reading. All further exercises and activities will draw upon the broad subject of the passage(s), and use f**unctional and situational approach**

Chapter / ***Grammar & vocabulary***	***Reading & comprehension***	***Listening & speaking***	***Core skills and personal attributes developed through the exercises***	***Objectives achieved through the exercises***	***Plan of evaluation***	
	Reading comprehension based on the passage(s): multiple-choice questions asking students to derive sense of a word from the context provided by a sentence, short questions asking students to sum up the key points of a passage, encouraging students to address not only explicit statement but also implied meaning.	Dialogues from situations related to what ***Writing and analysis*** has been encountered in the reading passages.; the dialogues may now be Instructions on how to lay out a piece of used in a role-play, and in groups, writing, and exercises where students may analyze them for meaning are asked to generate their own write-and implications, and ultimately engage in ups dialogues of their own making.			A three-tier system, allowing the student to work through self-assessment, assessment by peers, and finally, assessment by the teacher.	
Chapter – 1 .Read & Proceed The importance of the language used for communication: • Understanding the need for English in the wider world, and the opportunities afforded by a strong command of the language • Assessing one's level within the language, and understanding the ways in which grasp of the language can be bettered • Understanding the basic structure of the sentence. **English: subject – verb – object** - ***Functional grammar exercise:*** Students may discuss in groups or pairs when, why and where English is used. What, for example, if they have to face a job interview? Or make an official presentation in a State that does not use Telugu? Or even find their way in an unfamiliar city? **Possible areas of focus and evaluation:** • Making sentences from given keywords • Correcting the order of words to make sentences, noting how change in word order can affect meaning.	Short extracts from: 1.An interview with Arundhati Roy 2.Jawaharlal Nehru's 'Tryst with Destiny' speech 3.Albert Einstein's essay 'The World As I See It'	Sentences Understanding and using the basic structure of the sentence in English (subject – verb – object); creating sentences; understanding the different kinds of sentences (whether a statement, or a question, or an exclamation, and so on)	**Small conversations between :** 1.A student and a hostel warden 2.An interviewer and an interviewee 3.Two friends together preparing for an oral examination at college	Communication teamwork, problem solving, learning skills	Enhanced learner-participation, development of linguistic proficiency	[Both Teacher's Manual and Sample Test Questions will be provided]

Chapter 2. Travel Nouns, pronouns, and adjectives: • Understanding the kinds and uses of nouns • Understanding the use of pronouns to replace nouns • Understanding the ways in which nouns are qualified through adjectives • Understanding the kinds of adjectives, their degrees and their uses ***Functional grammar exercise:*** Students may be asked, in pairs, to plan a trip to a place of mutual interest. Each pair would then be encouraged to explain how and why they arrived at this choice. What words are used to identify – and distinguish – the proposed destination? What naming words are used? How those words are then qualified? How do the nouns (the naming words) and adjectives (the qualifiers) help to create a character and atmosphere for the place or site to be visited? Is it possible to build anticipation through such evocation? ***Potential areas of focus and evaluation:*** • Changing nouns to the related adjectives • Changing adjectives to the related nouns • Replacing nouns with pronouns while retaining the meaning of the sentence	Reading and analysis of short extracts from two or more of the following: 1.Vikram Seth, *From Heaven Lake* 2.Ruskin Bond, *Landor Days* 3.Rabindranath Tagore, *The Europe Traveller's Diary* 4.Pankaj Mishra, *Butter Chicken in Ludhiana*	**Paragraphs** Understanding the structure of a paragraph; retaining the thread of an argument; introducing the subject of the paragraph in the initial sentence; developing the argument in the next few sentences; drawing to a conclusion by reinforcing what has already been stated, but without introducing any new ideas towards the end; being brief and concise, but carrying all the information that needs to be conveyed	**Snippets of exchanges between:** 1.A tour guide and a tourist 2.A local inhabitant of a city and a visitor 3.A photographer and her friend, with the photographer telling about the places of interest she has been to in her recent travels	Communication, adaptability, sense of humour, reliability,	Functional approach to finding solutions, enhanced learner-participation, development of linguistic proficiency	[Both Teacher's Manual and Sample Test Questions will be provided]

Chapter 3. Gender Verbs and adverbs: • Understanding the placement of a verb within a sentence • Understanding tenses • Understanding the use of adverbs to describe verbs *Functional grammar exercise:* Students may be asked to consider recent news headlines for remarkable stories involving women. How are either the events or the women remarkable? What have these women done, or what do they do? What words of action are used to talk about the accomplishments of the women? How are actions of the past differentiated from actions of the present and actions yet to be performed? How (using what adverbs) are those actions qualified? ***Potential areas of focus and evaluation:*** • Changing verbs to the related adverbs • Changing adverbs to the related verbs •Using verbs in their correct tenses, deriving the sense from the rest of the sentence	Reading and analysis of short extracts from four newspaper/journal pieces: 1. *The Telegraph* report on the 20-year old Burdwan girl who walked out of her marriage in revolt of her in-laws' demands for dowry 2. A perspective on astronaut Kalpana Chawla's achievement 3.The inspirational story of a young woman who survived child-marriage 4.Sudha Murthy's write on what it is possible for women to achieve	Essays and arguments Understanding that an essay or argument is a descriptive or persuasive piece of writing that needs to be organized as a succession of paragraphs; introducing the chief concerns in the first paragraph, and providing a layout of how the argument is going to be structured; developing the main thrust of the argument in the succeeding paragraphs; making smooth transitions between ideas and paragraphs(using appropriate connecting words or phrases); winding to a conclusion by drawing the various strings of the argument together	**Short exchanges between:** 1. Two friends, on an issue of contemporary interest 2. A reporter and a talk-show guest 3. A teacher and a student in school	Communication, teamwork, commitment, integrity, self-motivation, self-esteem	Enhanced learner-participation, development of linguistic proficiency, development of critical thinking	[Both Teacher's Manual and Sample Test Questions will be provided]

Chapter 4. Disaster Management Articles and punctuation: • Understanding the uses of 'a', 'an', and 'the' • Understanding the uses of words/phrases expressing quantity, like 'some', 'a bit of', 'more', etc. • Understanding and using correct punctuation to convey meaning ***Functional grammar exercise:*** Students may be asked to imagine that in the aftermath of a natural disaster, they are part of a relief team effort. When asked to effectively identify the needs of the situation, how do they plan to go about providing necessary aid? Is *an* ambulance to be arranged for? Or *a* medical tent set up? Are *adequate* first-aid supplies available? Do *more* rations need to be fetched? Could there be a tie-up with *an* overseas relief organization?	Reading and analysis of a short piece on the tsunami	Official letters and emails Effectively using the format of official communication: providing one's own address and contact details, documenting the date and place from which the communication is sent, the salutation used for the addressee, the main body of the letter or email (keeping it comprehensive but to the point), and signing off	Dialogues between: 1.a social worker and an earthquake victim 2.two doctors working in an area afflicted by natural disaster 3.two school students campaigning to raise relief money	Communication, teamwork, problem solving, adaptability, stress management, reliability, integrity	Enhanced learner-participation, development of linguistic proficiency, functional approach to problem solving, enabling group work	[Both Teacher's Manual and Sample Test Questions will be provided]
Chapter 5 –Health Prepositions, conjunctions and exclamations: • Understanding the use of prepositions – words that connect verbs with their objects • Understanding that certain verbs use certain prepositions • Understanding the uses of common prepositions: to, for, at, by, of, and so on • Understanding the uses of conjunctio and exclamations ***Functional grammar exercise:*** Students may be asked to propose ways which healthier living might be attained eating better *and* exercising, drinking plenty *of* water, partaking fre vegetables *from* the Market, and so on. Possible exercises may be framed around: • Filling in blanks within sentences • Distinguishing between different meanings possible through the use of different prepositions with the same verbs	Reading and analysis of three different kinds of writing, and comparisons between them: 1. A Government of India report on the success of nationwide campaigns for polio vaccination 2. A vegetarian's perspective on what makes for healthy living 3. An athlete's say on the benefits of lifelong exercise	**Reports** Learning the difference between an essay, for example, and a report; learning to identify the key points of an event or incident, and documenting them briefly but in a manner that conveys both the temper and the unfolding of the event; understanding what is meant by a 'target readership', and learning to tailor the piece to the needs of that readership	**Brief exchanges between:** 1. A father and his son/daughter, as he explains the importance of staying fit 2. A friends discussing the ideal diet 3. A campus counsellor and a student	Personal presentation, stress-management, commitment, enthusiasm,, self-motivation	Development of linguistic proficiency, functional approach to problem solving	[Both Teacher's Manual and Sample Test Questions will be provided]

Chapter 6 Sports : Revision of all elements of grammar handled thus far, through evocative descriptions of State or national or international level sports stories, and discussion of them. ***Functional grammar exercise:*** Students may, in pairs, be asked to present an account of a memorable sports meet or game. The use of nouns pronouns, and adjectives should help to clarify exactly what event is being talked about. Judicious use of adjective will help provide the context: how important the game or match was, where it was held, and so on. In a brief account of the game, verbs and adverbs will be necessary to report exactly what happened. If the account has to be detailed and lively, students will be obliged to use the correct forms and tenses. Of course, throughout, not only will the right inflections and articles be necessary, so too will the precise use of prepositions.	Reading and analysis of two of four short pieces in depiction of: 1. Opportunities for men and women in sports 2. A decisive moment in a game 3. Expectation and failure 4. The attitude of sportsmanship	Presentations Learning to identify the key elements of any issue and putting them down as succinct points; structuring the points so that they may be elaborated on according to necessity; understanding the progression of points so that no important element is missed out, but also, repetitions are avoided	Small conversations between: 1. A fitness instructor and a trainee 2. Two friends discussing a possible career in sports 3. Two friends discussing their favorite game	Teamwork, integrity, self-motivation, self-esteem, commitment	Development of linguistic proficiency, functional approach to problem solving	[Both Teacher's Manual and Sample Test Questions will be provided]

Test Book: *Step by Step : Learning Language and Life Skills by* Pearson Longman; Pearson Publishers
Lab Manual: Strengthen your Steps (A Multimodal course in communication skills) by Maruthi Publications

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

MATHEMATICS-I *(Common to All Branches)*

Syllabus effective from 2010-2011

UNIT – I

Differential equations of first order and first degree – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.

UNIT – II

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, Sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x)

UNIT-III

Generalized Mean Value theorem (without proof) Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT-IV

Curve tracing – Cartesian - Polar and Parametric curves.

UNIT – V

Applications of Integration to Lengths, Volumes and Surface areas of revolution in Cartesian and Polar Coordinates.

UNIT – VI

Multiple integrals - double and triple integrals – change of variables – Change of order of Integration.

UNIT – VII

Vector Differentiation: Gradient- Divergence- Curl and their related properties of sums-products- Laplacian and second order operators.

UNIT-VIII

Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems.

Text Books: 'A Text Book of Engineering Mathematics – I' by U. M. Swamy, P. Vijaya Lakshmi, Dr. M. P.K.Kishore and Dr. K.L. Sai Prasad – Excel Books, New Delhi

References:

1. Engineering Mathematics, Vol- 1, Dr. D. S.C. Prism Publishers

2. Engineering Mathematics, B. V. Ramana , Tata Mc Graw Hill

3. "Advanced Engineering Mathematics", Erwin Kreszig, 8 Ed. Wiley Student Edition

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING PHYSICS -1 ***(Common to all branches)***
Syllabus effective from 2010-2011

UNIT-1

INTERFERENCE: Superposition of waves - Young's double slit experiment - Coherence - Interference in thin films by reflection -Newton's rings.

UNIT-II

DIFFRACTION: Fresnel and Fraunhofer diffractions - Fraunhofer diffraction at a single slit - Double slit - Diffraction grating - Grating spectrum - Resolving power of a grating - Rayleigh's criterion for resolving power.

UNIT-III

POLARIZATION: Types of Polarization - Double refraction - Nicol prism - Quarter wave plate and Half wave plate..

UNIT-IV

CRYSTAL STRUCTURE: Introduction - Space lattice - Basis - Unit cell - Lattice parameters - Bravais lattices - Crystal systems - Structure and packing fractions of simple cubic, Body centered cubic, Face centered cubic crystals.

UNIT-V

X-RAY DIFFRACTION: Directions and planes in crystals - Miller indices - Separation between successive [h k 1] planes - Diffraction of X - rays by crystal planes - Bragg's law - Laue method -Powder method.

UNIT-VI

LASERS: Introduction - Characteristics of lasers - Spontaneous and Stimulated emission of radiation - Einstein's coefficients - Population inversion - Ruby laser - Helium -Neon laser - Semiconductor laser - Applications of lasers in industry, scientific and medical fields.

UNIT-VII

FIBER OPTICS: Introduction - Principle 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-VIII

NON-DESTRUCTIVE TESTING USING ULTRASONICS: Ultrasonic Testing - Basic Principle - Transducer - Couplant and Inspection Standards - Inspection Methods - Pulse Echo Testing Technique -Flaw Detector - Different Types of Scans - Applications.

Text Books :

1.Perspective of Engineering Physics by Dr.M.Sri Rama Rao (Retd Prof. in Physics, Andhra University, Visakhapatnam), Dr.N.Chaudhary and D.Prasad, Pub: Acme Learning.

Reference books:

1. Engineering Physics by S. Mani Naidu (Pearson publishers)
2. Engineering Physics by Sanjay D Jain and Girish G Sahasrabudhe(University press)
3. Engineering Physics by alik and A K Singh(Tata Mc Graw-Hill Publishing company Limited)

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING CHEMISTRY – I (*Common to all branches)*
Syllabus effective from 2010- 2011

CONCEPTS IN CHEMISTRY –ENGINEERING APPLICATIONS

UNIT-I

1. JOULE THOMSON EFFECT

Definitions of Enthalpy, Free Energy, Entropy, Principle and explanation of Joule Thomson Effect, application to Air Conditioning , Refrigeration (WORKING PRINCIPLE AND FLOW DAIGRAMS)

2. OSMOSIS &REVERSE OSMOSIS

Principles of Osmosis& Reverse Osmosis, application to Desalination process-Types of Membranes used in desalination process-Limitations

3. LECHATELIERS PRINCIPLE ---

Definition of Chemical Equilibrium, Factors influence the Chemical Equilibrium, Statement and explanation of Lechateliers principle- Industrial applications for the production of Sulphuric Acid and Ammonia

4. SOLUBILITY PRODUCT& COMMON ION EFFECT--

Definition of Solubility & Ionic products, Industrial applications

UNIT-II

1.CATALYSIS

Explanation of Catalysis, Criteria of Catalysts, Few Industrial Catalysts

2. COLLOIDS

Explanation of Colloids- Properties of Colloids, Industrial applications of Colloids

3.FERMENTATION

Explanation of Fermentation with examples-Industrial applications

4.VISCOSITY:

Definition of Viscosity -Factors influence the Viscosity- Kinematic Viscosity-Determination of Molecular Weight of any one compound-Applications to fluids in motion –Type of flow.

UNIT-III

1.FLUORESENCE&PHOSPHORESENCE--- LUMINISCENT COMPOUNDS

Explanation of Fluorescence &Phosphorescence JOB s Diagram, Industrial applications of Chemiluminiscent compounds

2. PHOTO & LIGHT RESPONSIVE COMPOUNDS—SENSORS,BIOSENSORS

Explanation of Sensors & Biosensors-Principle –Few Applications

3. IONSELECTIVE ELECTRODES –

Principle- Chemistry &working of Electrode-applications to determination of Fluoride,Chloride and Nitrate

4. NUCLEAR MAGNETIC RESONANCE(NMR) : Principle –Few Electronic applications

UNIT-IV

1. SUPERCONDUCTIVTY – Definition-Preparation –Properties –Engineering Applications
2. SEMICONDUCTORS - Definition –Types of semiconductors (Stiochiometric,Non stichometric ,Organic, Controlled Valency Semiconductors, Doping)-applications
3. STORAGE DEVICES - Materials used and working of Floppy ,CD,Pendrive etc.
4. LIQUID CRYSTALS - Definition –Types - applications in LCD and Engineering Applications

.

UNIT – V

THERMAL ENERGY- introduction to solid fuels – definition – calorific value (LCV, HCV) bomb calorimeter, pulverized coal – carbonization – analysis of coal (proximate and ultimate analysis) – working of thermal power station.

UNIT - VI

Chemical sources of energy – single electrode potential – Nernest Equation- reference electrodes – concentration cells-primary and secondary cells – fuel cells.

UNIT-VII

NUCLEAR ENERGY: Introduction to nuclear fuels – binding energy – nuclear fission and fusion reactions – nuclear reactions – disposal of nuclear wastes.

UNIT-VIII

SOLAR CELLS- introduction – harnessing solar energy – solar heaters – photo voltaic cells – solar reflection – green house concepts.

*Teachers Are Requested To Provide Information About National And International Status Of Conventional And Non Conventional Sources To The Students

Text Book :

A Text Book Of En Gineering Chemistry By N.Krishan Murty Anuradha , Maruthi Publications

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

C- Programming (Common to All Branches)

Syllabus effective from 2010- 2011

UNIT I:

INTRODUCTION: Computer systems, Hardware & software concepts.

PROBLEM SOLVING: Algorithm / pseudo code, flowchart, program development steps, Computer Languages: machine, symbolic, and high-level languages, Creating and running programs: Writing, editing, compiling, linking, and executing.

BASICS OF C: Structure of a C program, identifiers, basic data types and sizes. Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation, Sample programs.

UNIT II:

BIT-WISE OPERATORS: logical, shift, rotation, masks.

SELECTION – MAKING DECISIONS: Two-way selection: if- else, null else, nested if, examples, Multi-way selection: switch, else-if, examples.

UNIT III:

STRINGS: concepts, c strings.

ITERATIVE: Loops - while, do-while and for statements, break, continue, initialization and updating, event and counter controlled loops, Looping applications: Summation, powers, smallest and largest.

UNIT IV:

ARRAYS: Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1-D arrays, 2-D arrays and character arrays, string manipulations, Multidimensional arrays , Array applications: Matrix Operations, checking the symmetricity of a Matrix,

UNIT V:

FUNCTIONS-MODULAR PROGRAMMING: Functions, basics, parameter passing, storage classes-extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, Recursive solutions for Fibonacci series, Towers of Hanoi, header files, C pre-processor, example c programs. Passing 1-D arrays, 2-D arrays to functions.

UNIT VI:

POINTERS: Pointers- concepts, initialization of pointer variables, pointers and function arguments, passing by address –dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.

UNIT VII:

ENUMERATED, STRUCTURE AND UNION TYPES: Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, program applications.

UNIT VIII:

FILE HANDLING: Input and output – concept of a file, text files and binary files, Formatted I/o, file I/o operations, example programs.

Text Books : ‘ The C – Programming Language’ B.W. Kernighan, Dennis M. Ritchie, PHI

Reference :

1. C Programming : A Problem - Solving Approach, Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.

2. Programming in C, Stephen G. Kochan, 3/e Pearson, 2007

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENVIRONMENTAL STUDIES (Common to all Branches)
Syllabus effective from 2010 -2011

UNIT - I
Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness.
UNIT - II
Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - III
Ecosystems : Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV
Biodiversity and its conservation : Introduction - Definition: genetic, species andecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a mega-diversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT - V
Environmental Pollution : Definition, Cause, effects and control measures of :

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

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

UNIT - VI

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

UNIT - VII

Human Population and the Environment: Population growth, variation among nations. Population explosion – Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. –Case Studies. Page 37 of 79

UNIT - VIII

Field work : Visit to a local area to document environmental assets River /forest grassland/hill/mountain - Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple cosystemspond, river, hill slopes, etc.

Text Books :

1. An Introduction to Environmental Studies by B. Sudhakara Reddy, T. Sivaji Rao, U. Tataji & K. Purushottam Reddy, Maruti Publications.

Reference :

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada
3. Text Book of Environmental Sciences and Technology by M. Anji Reddy, BS Publications.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

MATHEMATICAL METHODS (*Common to ALL branches)*
Syllabus effective from 2010-2011

UNIT – I

Linear systems of equations: Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- Gauss Elimination - Gauss Jordon and Gauss Seidal Methods.

UNIT – II

Eigen values - Eigen vectors – Properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem.

UNIT-III

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index – signature.

UNIT – IV

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

UNIT-V

Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences-Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton's formulae for interpolation – Interpolation with unevenly spaced points - Lagrange's Interpolation formula.

UNIT – VI

Numerical Differentiation and Integration – Differentiation using finite differences - Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule.

UNIT – VII

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods –Predictor-Corrector Methods- Milne's Method.

UNIT – VIII

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

Text Book : Ravindranath, V. and Vijayalaxmi, A., A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.

Reference Books :

1. Rukmangadachari, E. Mathematical Methods, Pearson Education, Delhi.
2. Kreszig, Erwin "Advanced Engineering Mathematics", 8 Ed. Wiley Student Edition.
3. Peter O' Neil, "Engineering Mathematics", Cengage Learning. Gordon, "Engineering Mathematics", Pearson Education

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING PHYSICS &CHEMISTRY LABORATORY-1 (*Common to all branches)*

Syllabus effective from 2010- 2011

PHYSICS-I

A. Mechanics

1. Determine the Rigidity Modulus of the material of the wire using Torsional Pendulum.
2. Determine the Frequency of vibration in Transverse and Longitudinal Mode using Melde's Apparatus.
3. Verify the Laws Transverse vibrations in stretched strings using Sonometer.
4. Determine the Velocity of Sound by Volume Resonator method.
5. Determine the Acceleration due to Gravity and Radius of Gyration using Compound Pendulum.

B. Optics:

6. Determine the Wavelength of a source by Normal Incidence method using Diffraction Grating.
7. Determine the Radius Curvature of a convex lens by forming Newton's Rings.
8. Determine the Refractive Index of the material of Prism (Minimum Deviation method) using Spectrometer.
9. Determine the Thickness of the Spacer used to form Parallel fringes due to Wedge shaped film.
10. Determination of Single slit diffraction using Lasers.

Manual/Record Books:

1. Manual cum Record for Engineering Phaysics Lab-1, by Prof.Sri M. Rama Rao, Acme Learning.

2. Lab manual – 1, of Engineering Physics by Dr. Y.Aparna and Dr. K.Venkateswara Rao (VGS Books links, Vijayawada)

CHEMISTRY LAB - 1

LIST OF EXPERIMENTS

1. Introduction to Chemistry Lab (the teachers are expected to teach fundamentals like Primary, Secondary Standard Solutions , Normality, Molarity, Molality etc and laboratory ware used, error ,accuracy, precision, Theory of indicators, use of volumetric titrations
2. **Introduction to Volumetric Analysis:**

The Teacher has to perform four types of volumetric titrations and will explain about the working of Indicators .(The Teacher has to call the students at random to perform the titrations)

2. ANALYSIS OF WATER

Estimation of :

a.**Calcium,Magnesium, ,Iron (111),Zinc (SEPERATELY)**

b.TOTAL HARDNESS BY EDTA METHOD

c..TURBIDITY

d.CONDUCTIVITY

e pH

f.TOTAL DISSOLVED SALTS

g.FLORIDES,CHLORIDES AND NITRATES (USING ION ANALYSER OR BY COLORIMETER)

h. DISSOLVED OXYGEN

i.BACTERIAL COUNT

The student has to get his water sample and the teacher has to explain the analysis and the results are to be compared with the INDIAN STANDRDS.

- All the teachers are requested to give top priority to water analysis as it is very useful for the students and society.complete water analysis may take couple of hours more but this has a unique influence on the system.

3.CONSTRUCTION OF GALVANIC CELL

Based on the position of the metals in the electrochemical series a model Electrochemical Cell is constructed and the values are determined and effect of metal ion concentration, Temprature etc. on emf are calculated.

Lab Manual :

Engineering chemistry laboratory manual &record By srinivasulu .d parshva publications

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING WORKSHOP (Common to all Branches)

Syllabus effective from 2010- 2011

I B.Tech – I Sem.

Note: At least two exercises to be done from each trade.

Trade:

Carpentry	1. T-Lap Joint
	2. Cross Lap Joint
	3. Dovetail Joint
	4. Mortise and Tennon Joint
Fitting	1. Vee Fit
	2. Square Fit
	3. Half Round Fit
	4. Dovetail Fit
Black Smithy	1. Round rod to Square
	2. S-Hook
	3. Round Rod to Flat Ring
	4. Round Rod to Square headed bolt
House Wiring	1. Parallel / Series Connection of three bulbs
	2. Stair Case wiring
	3. Florescent Lamp Fitting
	4. Measurement of Earth Resistance
Tin Smithy	1. Taper Tray
	2. Square Box without lid
	3. Open Scoop
	4. Funnel

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

C PROGRAMMING LAB (Common to all Branches)

Syllabus effective from 2010 -2011

Objectives:

- To learn/strengthen a programming language like C, To learn problem solving techniques

Recommended Systems/Software Requirements:

- Intel based desktop PC, ANSI C Compiler with Supporting Editors, IDE's such as Turbo C, Bloodshed C,
- Linux with gcc compiler

Exercise l

Solving problems such as temperature conversion, student grading, income tax calculation, etc., which expose students to use basic C operators

Exercise 2

2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

Exercise 3

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

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

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

d) Write a program which checks a given integer is Fibonacci number or not.

Exercise 4

a) Write a C program to calculate the following Sum:

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

b) Write a C program to find the roots of a quadratic equation.

Exercise 5

a) The total distance travelled by vehicle in't' seconds is given by distance = $ut+1/2at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance travelled 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 for different values of 'u' and 'a'.

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

Exercise 6

a) Simple programming examples to manipulate strings.

b) Verifying a string for its palindrome property

Exercise 7

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

i. To insert a sub-string in to given main string from a given position.
ii. To delete n Characters from a given position in a given string.
iii. To replace a character of string either from beginning or ending or at a specified location

Exercise 8

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

i) Reading a complex number ii) Writing a complex number

iii) Addition of two complex numbers iv) Multiplication of two complex numbers

Exercise 9

a) Addition of Two Matrices

b) Calculating transpose of a matrix in-place manner.

c) Matrix multiplication by checking compatibility

Exercise 10

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

i) To find the factorial of a given integer.
ii) To find the GCD (greatest common divisor) of two given integers.
iii) To solve Towers of Hanoi problem.

Exercise 11
a) Write a C functions to find both the largest and smallest number of an array of integers.

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

i) that displays the position/ index in the string S where the string T begins, or –1 if S doesn't contain T.

ii) to count the lines, words and characters in a given text.

Exercise 12

a) Write a C function to generate Pascal's triangle.
b) Write a C function to construct a pyramid of numbers.
Exercise 13

Write a C function to read in two numbers, x and n, and then compute the sum of this geometric progression:

$1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$

Write a C function to read in two numbers, x and n(no. of terms), and then compute sin(x) and cos(x).

Exercise 14

a. Pointer based function to exchange value of two integers using passing by address.
b. Program which explains the use of dynamic arrays.
c. Program to enlighten dangling memory problem (Creating a 2-D array dynamically using pointer to pointers approach.

Exercise 15

Examples which explores the use of structures, union and other user defined variables

Exercise 16

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)

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

MATHEMATICS-II *(Common to All branches)*
Syllabus effective from 2010-2011

UNIT – I

Laplace transforms of standard functions –Shifting Theorems, Transforms of derivatives and integrals – Unit step function –Dirac's delta function.

UNIT – II

Inverse Laplace transforms– Convolution theorem - Application of Laplace transforms to ordinary differential equations Partial fractions.

UNIT – III

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval– Half-range sine and cosine series.

UNIT – IV

Fourier integral theorem (only statement) – Fourier sine and cosine integrals - Fourier transform – sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

UNIT – V

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations.

UNIT – VI

Method of Separation of Variables - Applications to wave equation, heat equation and Laplace Equation.

UNIT – VII

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems -Inverse z-transform -Convolution theorem – Solution of difference equation by z-transforms.

UNIT – VIII

Gamma and Beta Functions – Properties – Evaluation of improper integrals.

TEXT BOOK:

1. Swamy,U.M., Vijayalaxmi, P.,Ravikumar, R.V.G., and Phani Krishna Kishore., Mathematics II, Excel Books, New Delhi.

BOOKS:

1. B.V.Ramana, Engineering Mathematics, Tata Mc Graw Hill.
2. Iyengar,T.K.V, Krishna Gandhi, et.al Engineering Mathematics Vol-II, S.Chand Co. New Delhi.
3. Erwin Kreszig, "Advanced Engineering Mathematics", 8 Ed Wiley Student Edition.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING PHYSICS - II (*Common to all branches)*
Syllabus effective from 2010- 2011

UNIT-I

QUANTUM MECHANICS & QUANTUM COMPUTING: Introduction - Schrodinger Time Independent and Time Dependent wave equations - Particle in a box - Operator version -Suitability of Quantum system for Information Processing - Classical Bits and Qu-Bits - Bloch's Sphere - Quantum Gates - Multiple Qu-Bits - Advantages of Quantum Computing over classical Computation.

UNIT-II

ELECTRON THEORY OF METALS: Classical free electron theory - Mean free path - Relaxation time and drift velocity - Quantum free electron theory - Fermi - Dirac (analytical) and its dependence on temperature - Fermi energy - Electron scattering and resistance.

UNIT-HI

BAND THEORY OF SOLIDS: Bloch theorem (qualitative) - Kronig - Penney model - Origin of energy band formation in solids - Classification of materials into conductors, semi- conductors & insulators -Concept of effective mass of an electron.

UNIT-IV

MAGNETIC PROPERTIES: Permeability - Magnetization - Orgin of magnetic moment - Classification of Magnetic materials - Dia, para and ferro- magnetism -Domain and Weiss field theory - Hysteresis Curve - Soft and Hard magnetic materials.

UNIT-V

SUPERCONDUCTIVITY: General properties - Meissner effect - Penetration depth - Type I and type II superconductors - Flux quantization - DC and AC Josephson effect - BCS Theory - Applications of superconductors.

UNIT-VI

DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, ionic and orientational polarizations - Internal fields in solids - Clausius-Mossotti equation - Dielectrics in alternating fields - frequency dependence of the polarizability - Ferro and Piezo electricity.

UNIT-VII

SEMICONDUCTORS: Introduction - Intrinsic semiconductor and carrier concentration - Equation for conductivity - Extrinsic semiconductor and carrier concentration - Drift and diffusion - Einstein's equation - Hall effect - Direct & indirect band gap semiconductors.

UNIT-VIII

PHYSICS OF NANO MATERIALS: Introduction - Properties and prepation of Nano Materials -Surface occupancy - Reduction of Dimensionality - 4D -Force vector - Quantum wires - Quantum dots and Quantum wells - Density of states and Energy spectrum - Nanotubes - Applications of nanomaterials.

Text book: Perspective of Engineering Physics - II by M Sri Ramarao, Nityananda Choudary, Daruka Prasad, ACME Learning.

Refernce books: 1. Solid State Physics – by A J Dekker , Mcmilan India Ltd.
2. A Text Book of Engineering Physics , by Bhattacharya & Bhaskara , Oxford University Press
3. Engineering Physics by K Shiva Kumar, Prism Books Pvt. Ltd

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING CHEMISTRY – II (*Common to all branches)*
Syllabus effective from 2010- 2011

UNIT-I

POLYMERS: Introduction - Types of polymers – Classification - Methods of polymerisation – Stereo specific polymers - Ziegler Natta catalysis - Properties of polymers –Conducting Polymers- Engineering applications – Biodegradable polymers - Individual polymers(Preparation ,Properities,Uses of Poly Styrene, PVC, PTFE, Bakelite's, Cellulose derivatives, Poly Carbonates)

UNIT-II

PLASTICS – Types –Compounding of plastics- Moulding(Four types)- Fiber reinforced , Glass fibre reinforced plastics –Bullet Proof Plastics– Properties of plastics – Engineering applications

UNIT-III

RUBBERS & ELASTOMERS: Introduction – Preparation – Vulcanization – Properties - Engineering applications.

Buna-S,Buna-N, - Poly Urethane - Engineering applications of Elastomers

UNIT-IV

NANO MATERIALS

Introduction to Nano materials-preparation of few Nano materials(Carbon Nano Tubes,Fullerenes etc)-Properities of Nano materials- Engineering applications.

UNIT-V

BUILDING MATERIALS(CEMENT,REFRACTORIES,CRAMICS):

CEMENT

Introduction, Manufacturing of Portland Cement(Dry &We Process)-Chemistry of Setting and Hardening of Cement-Effect of Carbon dioxide,Sulphur Dioxide ,Chloride on Cement concrete.

REFRACTORIES

Introduction-Classification –Properties-Applications

CERAMICS

Introduction-Classification – Glazed &Unglazed Ceramics -Properties-Engineering Applications.

UNIT-VI

FUEL TECHNOLOGY

Introduction to Liquid Fuels-Classification of Crude Oil-Fractional Distillation-Cracking (Thermal &Catalytic), Polymerization-Refining &Reforming –Working of Internal Combustion Engine, Heated Chambers-Knocking –AntiKnocking Agents-Octane &Cetane Number.

LUBRICANTS

Definition and Explanation of Lubrication-Mechanism of Lubrication –Types of Lubricants-Properties of Lubricants-Engineering applications

UNIT-VII

CORROSION – Mechanism- Factors influence the rate of corrosion - Types of Corrosion -Protection methods (Anodic & Cathodic protection), - Metallic Coatings - Paints, Varnishes, Enamels , Special paints.

UNIT-VIII
GREEN CHEMISTRY
Introduction-Concepts- Engineering Applications

Text Book : A Text book of engineering chemistry by Srinivasulu D. Parshva publications

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING DRAWING (Common to all Branches)

Syllabus effective from 2010- 2011

I B.Tech – II Semester

Unit-I

Polygons-Construction of Regular Polygons using given length of a side; Ellipse- Arcs of Circles and Oblong Methods; Scales-Vernier and Diagonal Scales.

Unit-II

Introduction to Orthographic Projections; Projections of Points; Projections of Straight Lines parallel to both planes; Projections of Straight Lines-Parallel to one and inclined to other plane.

Unit-III

Projections of Straight Lines inclined to both planes, determination of true lengths, angle of inclinations and traces.

Unit-IV

Projections of Planes; Regular Planes Perpendicular / Parallel to one Reference

Plane and inclined to other Reference Plane; inclined to both the Reference Planes.

Unit-V

Projections of Solids-Prisms and Cylinders with the axis inclined to one Plane.

Unit-VI

Projections of Solids- Pyramids and Cones with the axis inclined to one plane.

Unit-VII

Conversion of Isometric Views to Orthographic Views.

Unit-VIII

Conversion of Orthographic Views to Isometric Projections and Views.

TEXT BOOK:

1. Engineering Drawing by N.D. Bhat, Chariot Publications

REFERENCE BOOKS:

1. Engineering Drawing by M.B. Shah and B.C. Rana, Pearson Publishers
2. Engineering Drawing by Dhananjay A. Jolhe, Tata McGraw Hill Publishers
3. Engineering Graphics for Degree by K.C. John, PHI Publishers

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENVIRONMENTAL STUDIES (Common to all Branches)
Syllabus effective from 2010 -2011

UNIT - I
Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness.
UNIT - II
Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - III
Ecosystems : Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV
Biodiversity and its conservation : Introduction - Definition: genetic, species andecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a mega-diversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT - V
Environmental Pollution : Definition, Cause, effects and control measures of :

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and

industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

UNIT - VI

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

UNIT - VII

Human Population and the Environment: Population growth, variation among nations. Population explosion – Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. –Case Studies. Page 37 of 79

UNIT - VIII

Field work : Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple cosystemspond, river, hill slopes, etc.

Text Books :

1. An Introduction to Environmental Studies by B. Sudhakara Reddy, T. Sivaji Rao, U. Tataji & K. Purushottam Reddy, Maruti Publications.

Reference :

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada
3. Text Book of Environmental Sciences and Technology by M. Anji Reddy, BS Publications.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

MATHEMATICAL METHODS (*Common to ALL branches)*
Syllabus effective from 2010-2011

UNIT – I

Linear systems of equations: Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- Gauss Elimination - Gauss Jordon and Gauss Seidal Methods.

UNIT – II

Eigen values - Eigen vectors – Properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem.

UNIT-III

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index – signature.

UNIT – IV

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

UNIT-V

Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton's formulae for interpolation – Interpolation with unevenly spaced points - Lagrange's Interpolation formula.

UNIT – VI

Numerical Differentiation and Integration – Differentiation using finite differences - Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule.

UNIT – VII

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods –Predictor-Corrector Methods-Milne's Method.

UNIT – VIII

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

Text Book : Ravindranath, V. and Vijayalaxmi, A., A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.

Reference Books :

1. Rukmangadachari, E. Mathematical Methods, Pearson Education, Delhi.
2. Kreszig, Erwin "Advanced Engineering Mathematics", 8 Ed. Wiley Student Edition.
3. Peter O' Neil, "Engineering Mathematics", Cengage Learning. Gordon, "Engineering Mathematics", Pearson Education

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

ENGINEERING PHYSICS&CHEMISTRY LABORATORY- II

PHYSICS:

Electro-Magnetism and Electronics:

1.Determine the Planck's constant using Photo-Ceil.
2.Study the variation of Magnetic Field along the axis of a solenoid coil using Stewart - Gee's apparatus.
3.Draw the Frequency Response curves of L-C-R Series and Parallel Circuits.
4.Determine the Time Constant for a C-R Circuit.
5.Determine the Band Gap of a Semi conductor using a p-n junction diode.
6.Study of Characteristic curves (l/V) of a Zener diode to determine its Breakdown voltage.
7.Determine the Hall Coefficient of a Semiconductor.
8.Draw the characteristic curves and determine the Thermoelectric coefficient of a Thermistor
9.Study the Seebeck and Peltier - Thermoelectric Effects and to determine Coefficients and Thermo Electric Effect using Thermocouple.
10.Draw the Characteristic curves of a p-i-n and Avalanche Photo Diodes.
11.Determination of Numerical Aperture and Bending losses of an Optical Fiber.

Manual Cum Record Books :

1. Manual cum Record for Engineering Phaysics Lab- II, by Prof.Sri M. Rama Rao, Acme Learning.. .
2. Lab manual - II, of Engineering Physics by Dr. Y.Aparna and Dr. K.Venkateswara Rao (VGS Books links, Vijayawada)

CHEMISTRY LAB – II

1.PRODUCTION OF BIODIESEL.

INTRODUCTION TO BIO FUELS

The teacher has to perform the transesterfication reaction of FATTY ACID and the Biodiesel thus produced can be used for analysis.(Please give priority to production of Biodiesel from waste cooking oil)

2. Estimation of properties of oil:

a. Acid Number
b. Viscosity
c. Saponification value
d. Aniline point
e. Flash and Fire points
f. Pour and Cloud point

3.. PREPARATION OF PHENOL –FORMALDEHYDE RESIN

4. SOIL ANALYSIS:

pH, Determination of Zinc, Iron, Copper.

5.FOOD ANALYSIS:

Determination Saturated and Unsaturated Fatty Acids, pH,etc.

All the teachers are requested to focus on bio fuels ,soil analysis and food analysis as these are the need of 21 st century and these experiments are so desigened to encourage students to carry out lab to land process.

Lab Manual : Engineering chemistry laboratory manual &record By Srinivasulu . D. Parshva publications

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IT WORKSHOP (Common to all Branches)

Syllabus effective from 2010- 2011

Syllabus Preparation under progress

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Common to all Branches (w.e.f.2010 batch)

Unit I

Introduction to Managerial Economics:

Introduction to Managerial Economics & Demand Analysis: Definition of Managerial Economics, Characteristics and Scope – Managerial Economics and its relation with other subjects- Basic economic tools in Managerial Economics

Demand Analysis: Meaning- Demand distinctions- Demand determinants- Law of Demand and its exceptions.

Unit-II

Elasticity of Demand & Demand Forecasting: Definition -Types of Elasticity of demand - Measurement of price elasticity of demand: Total outlay method, Point method and Arc method- Significance of Elasticity of Demand.

Demand Forecasting: Meaning - Factors governing demand forecasting - Methods of demand forecasting (survey of buyers' Intentions, Delphi method, Collective opinion, Analysis of Time series and Trend projections, Economic Indicators, Controlled experiments and Judgmental approach) - Forecasting demand for new products- Criteria of a good forecasting method.

Unit-III

Theory of Production and Cost Analysis: Production Function- Isoquants and Isocosts, MRTS, Law of variable proportions- Law of returns to scale- Least Cost Combination of Inputs, Cobb-Douglas Production function - Economies of Scale.

Cost Analysis: Cost concepts, Opportunity cost, Fixed Vs Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs.-Determination of Break-Even Point (simple problems) - Managerial Significance and limitations of BEP.

UNIT-IV

Introduction to Markets, Managerial Theories of the Firm & Pricing Policies: Market structures**:** Types of competition, Features of Perfect Competition, Monopoly and Monopolistic Competition. Price-Output Determination under Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly Managerial theories of the firm - Marris and Williamson's models.

Pricing Policies: Methods of Pricing-Marginal Cost Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Bundling Pricing, and Peak Load Pricing. Internet Pricing Models: Flat rate pricing, Usage sensitive pricing, Transaction based pricing, Priority pricing, charging on the basis of social cost, Precedence model, Smart market mechanism model.

Unit V

Types of Industrial Organization & Introduction to business cycles: Characteristic features of Industrial organization, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, State/Public Enterprises and their types.

Introduction to business cycles: Meaning-Phases of business cycles- Features of business cycles.

Unit VI

Introduction to Financial Accounting: Introduction to Double-entry system, Journal, Ledger, Trial Balance- Final Accounts (with simple adjustments)- Limitations of Financial Statements.

Unit VII

Interpretation and analysis of Financial Statement: Ratio Analysis – Liquidity ratios, Profitability ratios and solvency ratios – Preparation of changes in working capital statement and fund flow statement.

Unit VIII

Capital **and Capital Budgeting**: Meaning of capital budgeting, Need for capital budgeting – Capital budgeting decisions (Examples of capital budgeting) - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), IRR and Net Present Value Method (simple problems)

Text Books:

1. **J.V.Prabhakar Rao**: Managerial Economics and Financial Analysis, Maruthi Publications, 2011
2. **N. Appa Rao. & P. Vijaya Kumar**: 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi, 2011

References:

1. A R Aryasri - Managerial Economics and Financial Analysis, TMH 2011
2. Suma damodaran- Managerial Economics, Oxford 2011
3. S.A. Siddiqui & A.S. Siddiqui, Mangerial Economice and Financial Analysis, New Age International Publishers, 2011.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

ELECTRONIC DEVICES AND CIRCUITS

Unit-I

Electron Ballistics and Applications: Force on Charged Particles in Electric field, Constant Electric Field, Potential, Relationship between Field Intensity and Potential, Two Dimensional Motion, Electrostatic Deflection in Cathode ray Tube, CRO, Force in Magnetic Field, Motion in Magnetic Field, Magnetic Deflection in CRT, Magnetic Focusing, Parallel Electric and Magnetic fields and Perpendicular Electric and Magnetic Fields.

Unit- II

Review of Semi Conductor Physics : Insulators, Semi conductors, and Metals classification using Energy Band Diagrams, Mobility and Conductivity, Electrons and holes in Intrinsic Semi conductors, Extrinsic Semi Conductor, (P and N Type semiconductor) Hall effect, Generation and Recombination of Charges, Diffusion, Continuity Equation, Injected Minority Carriers, Law of Junction, Fermi Dirac Function, Fermi level in Intrinsic and Extrinsic Semiconductor

Unit- III

Junction Diode Characteristics : Open circuited P N Junction, Forward and Reverse Bias, Current components in PN Diode, Diode Equation,Volt-Amper Characteristic, Temperature Dependence on V – I characteristic, Step Graded Junction, Diffusion Capacitance and Diode Resistance (Static and Dynamic), Energy Band Diagram of PN Diode,

Special Diodes: Avalanche and Zener Break Down, Zener Characterisitics, Tunnel Diode, Characteristics with the help of Energy Band Diagrams, Varactor Diode, LED, PIN Diode, Photo Diode

Unit IV

Rectifiers and Filters: Half wave rectifier, ripple factor, full wave rectifier(with and without transformer), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter, Π- section filter, Multiple L- section and Multiple Π section filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators

Unit- V

Transistors :

Junction transistor, Transistor current components, Transistor as an amplifier, Characteristics of Transistor in Common Base and Common Emitter Configurations, Analytical expressions for Transistor Characteristics, Punch Through/ Reach Through, Photo Transistor, Typical transistor junction voltage values.

Unit VI

Field Effect Transistors:

JFET characteristics (Qualitative and Quantitative discussion), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Introduction to SCR and UJT and their characteristics,

UNIT-VII

Transistor Biasing and Thermal Stabilization : Transistor Biasing and Thermal Stabilization: Operating point, Basic Stability, Collector to Base Bias, Self Bias Amplifiers, Stabilization against variations in V_{BE},, and β for the self bias circuit, Stabilization factors, (S, S', S''), Bias Compensation, Thermistor and Sensitor compensation, Compensation against variation in V_{BE}, I_{co},, Thermal runaway, Thermal stability

UNIT- VIII

Small signal low frequency Transistor models: Two port devices and the Hybrid model, Transistor Hybrid model, Determination of h-parameters from characteristics, Measurement of h-parameters, Conversion formulas for the parameters of three transistor configurations, Analysis of a Transistor Amplifier circuit using h- parameters, Comparison of Transistor Amplifier configurations

Text Books

1. Electronic Devices and Circuits – J. Millman, C.C. Halkias, Tata Mc-Graw Hill

Reference

1. Electronic Devices and Circuits – K Satya Prasad, VGS Book Links
2. Integrated Electronics – Jacob Millman, Chritos C. Halkies,, Tata Mc-Graw Hill, 2009
3. Electronic Devices and Circuits – Salivahanan, Kumar, Vallavaraj, TATA McGraw Hill, Second Edition
4. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9thEdition,2006
5. Electronic Devices and Circuits -BV Rao, KBR Murty, K Raja Rajeswari, PCR Pantulu, Pearson, 2nd edition

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

PROBABILITY THEORY AND STOCHASTIC PROCESSES

UNIT I

PROBABILITY: 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, Bayes' Theorem, Independent Events:

UNIT II

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, Exponential, Rayleigh, Conditional Distribution, Conditional Density, Properties.

UNIT III

OPERATION ON ONE RANDOM VARIABLE – 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, Nonmonotonic Transformations of Continuous Random Variable

UNIT IV

MULTIPLE RANDOM VARIABLES : Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density – Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, Unequal Distribution, Equal Distributions.

UNIT V

OPERATIONS ON MULTIPLE RANDOM VARIABLES : Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

UNIT VI

RANDOM PROCESSES – TEMPORAL CHARACTERISTICS : The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationarity 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, Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

UNIT VII

RANDOM PROCESSES – SPECTRAL CHARACTERISTICS: The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

UNIT VIII

LINEAR SYSTEMS WITH RANDOM INPUTS : Random Signal Response of Linear Systems: System Response – Convolution, Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and Output, Band pass, Band-Limited and Narrowband Processes, Properties, Modeling of Noise Sources:

Resistive (Thermal) Noise Source, Arbitrary Noise Sources, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks.

TEXT BOOKS :

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

REFERENCES :

1. .Probability Theory and Stochastic Process – B Prabhakara Rao , Oxford University Press.
2. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W. Woods, Pearson Education, 3rd Edition.
3. Probability Methods of Signal and System Analysis. George R. Cooper, Clave D. MC Gillem, Oxford, 3rd Edition, 1999.
4.Statistical Theory of Communication - S.P. Eugene Xavier, New Age Publications, 2003.

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

NETWORK ANALYSIS

UNIT – I

Introduction to Electrical Circuits : Network elements classification, Electric charge and current, Electric energy and potential, Resistance parameter – series and parallel combination, Inductance parameter – series and parallel combination, Capacitance parameter – series and parallel combination. Energy sources: Ideal, Non-ideal, Independent and dependent sources, Source transformation, Kirchoff's laws, Mesh analysis and Nodal analysis problem solving with resistances only including dependent sources also. (Text Books: 1,2,3, Reference Books: 3)

UNIT – II

A.C Fundamentals and Network Topology: Definitions of terms associated with periodic functions: Time period, Angular velocity and frequency, RMS value, Average value, Form factor and peak factor-problem solving, Phase angle, Phasor representation, Addition and subtraction of phasors, mathematical representation of sinusoidal quantities, explanation with relevant theory, problem solving. Principal of Duality with examples.

Network Topology: Definitions of branch, node, tree, planar, non-planar graph, incidence matrix, basic tie set schedule, basic cut set schedule. (Text Books: 2,3, Reference Books: 3)

UNIT – III

Steady State Analysis of A.C Circuits : Response to sinusoidal excitation - pure resistance, pure inductance, pure capacitance, impedance concept, phase angle, series R-L, R-C, R-L-C circuits problem solving. Complex impedance and phasor notation for R-L, R-C, R-L-C problem solving using mesh and nodal analysis, Star-Delta conversion, problem solving. (Text Books: 1,2, Reference Books: 3)

UNIT – IV

Coupled Circuits : Coupled Circuits: Self inductance, Mutual inductance, Coefficient of coupling, analysis of coupled circuits, Natural current, Dot rule of coupled circuits, Conductively coupled equivalent circuits- problem solving.

Resonance: Introduction, Definition of Q, Series resonance, Bandwidth of series resonance, Parallel resonance, Condition for maximum impedance, current in anti resonance, Bandwidth of parallel resonance, general case- resistance present in both branches, anti resonance at all frequencies. (Text Books:2,3, Reference Books: 3)

UNIT – V

Network Theorems: Thevinin's, Norton's, Milliman's, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, Tellegens- problem solving using dependent sources also. (Text Books: 1,2,3, Reference Books: 2)

UNIT – VI

Two-port networks : Relationship of two port networks, Z-parameters, Y-parameters, Transmission line parameters, h-parameters, Inverse h-parameters, Inverse Transmission line parameters, Relationship between parameter sets, Parallel connection of two port networks, Cascading of two port networks,

series connection of two port networks, problem solving including dependent sources also. (Text Books: 1,2, Reference Books: 1,3)

UNIT – VII

Transients : First order differential equations, Definition of time constants, R-L circuit, R-C circuit with DC excitation, Evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogenous, problem solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots. Solutions using Laplace transform method. (Text Books: 1,2,3, Reference Books: 1,3)

UNIT – VIII

Filters : L.P.F, H.P.F, B.P.F, Band Elimination, All pass prototype filters design, M-derived filters of L.P. and H.P. filters only, Composite design of L.P. and H.P filters. (Text Books: 2, Reference Books:1, 2,3)

TEXT BOOKS :

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, 3rd Edition, 2000.
2.Network Analysis by K.Satya Prasad and S Sivanagaraju, Cengage Learning
3. Electric Circuit Analysis by Hayt and Kimmarle, TMH

REFERENCES :

1. Network lines and Fields by John. D. Ryder 2nd edition, Asia publishing house.
2. Basic Circuit Analysis by DR Cunninghan, Jaico Publishers.
3. Network Analysis and Filter Design by Chadha, Umesh Publications.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

SIGNALS AND SYSTEMS

UNIT I

SIGNAL ANALYSIS : 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, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

UNIT II

FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS : Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum

UNIT III

FOURIER TRANSFORMS : Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT IV

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS : Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

UNIT V

CONVOLUTION AND CORRELATION OF SIGNALS : Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function. Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT VI

SAMPLING : Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT VII

LAPLACE TRANSFORMS : Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's, Relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT VIII

Z–TRANSFORMS : Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms.

TEXT BOOKS :

1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.

REFERENCES :

1. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2nd Edition.
2. Signals & Systems- Narayan Iyer and K Satya Prasad , Cenage Pub.
3. Fundamentals of Signals and Systems- Michel J. Robert, MGH International Edition, 2008.
4. Signals and Systems – A Rama Krishna Rao, Tata McGrawHill

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

ELECTRICAL TECHNOLOGY

UNIT I

DC MACHINES : Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators

UNIT II

D.C. MOTORS : DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne's test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT III

TRANSFORMERS : Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit

UNIT IV

PERFORMANCE OF TRANSFORMERS : Losses and Efficiency of transformer and Regulation – OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

UNIT V

THREE PHASE INDUCTION MOTOR : Principle of operation of three-phase induction motors – Slip ring and Squirrel cage motors – Slip-Torque characteristics – Efficiency calculation – Starting methods.

UNIT VI

ALTERNATORS : Alternators – Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors – Predetermination of regulation by Synchronous Impedance Method – OC and SC tests.

UNIT VII

SINGLE PHASE INDUCTION MOTORS : Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

UNIT VIII

ELECTRICAL INSTRUMENTS : Basic Principles of indicating instruments – Moving Coil and Moving iron Instruments (Ammeters and Voltmeters)

TEXT BOOKS:

1.Basic Electrical Engineering by Nagsarkar,Sukhija, Oxford Publications,2nd edition

REFERENCE BOOKS:

1.Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah,TMH Publications

2.Fundamentals of Electrical Engineering by Rajendra Prasad, PHI Publications,2nd edition

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

ELECTRONIC DEVICES AND CIRCUITS LAB

PART A : (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 6 lab sessions) :

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Lowpower JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
3. Soldering practice – Simple Circuits using active and passive components.
4. Single layer and Multi layer PCBs (Identification and Utility).
5. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   1. Study and Operation of CRO.

PART B : (For Laboratory examination – Minimum of 10 experiments)

1. **Frequency measurment using Lissajous Figures**
2. PN Junction diode characteristics A. Forward bias B. Reverse bias.(cut-in voltage & Resistance calculations)
3. Zener diode characteristics and Zener as a regulator
4. Transistor CB characteristics (Input and Output) & h Parameter calculations
5. Transistor CE characteristics (Input and Output) & h Parameter calculations
6. Rectifier without filters (Full wave & Half wave)
7. Rectifier with filters (Full wave & Half wave)
8. FET characteristics
9. SCR Charecteristics
10. UJT Charectristics
11. CE Amplifier
12. CC Amplifier (Emitter Follower).

PART C:

Equipment required for Laboratories:

1. Regulated Power supplies (RPS) - 0-30v
2. CROs - 0-20M Hz.
3. Function Generators - 0-1 M Hz.
4. Multimeters
5. Decade Resitance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Micro Ammeters (Analog or Digital) - 0-20 µA, 0-50µA, 0-100µA, 0-200µA
8. Voltmeters (Analog or Digital) - 0-50V, 0-100V, 0-250V
9. Electronic Components - Resistors, Capacitors, BJTs, LCDs, SCRs, UJTs, FETs, LEDs, MOSFETs,diodes,transistors

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. I Sem.

NETWORKS & ELECTRICAL TECHNOLOGY LAB

PART – A

1. Serial and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network.
2. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
3. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
6. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.
7. Constant K - LP, HP, BP Filters
8. m derived filters
9. Composite Filters

PART – B

1. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.
2. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
3. Brake test on DC shunt motor. Determination of performance characteristics.
4. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
5. Brake test on 3-phase Induction motor (performance characteristics).
6. Regulation of alternator by synchronous impedance method

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II Year –I Sem. (Common to All Branches)

ENGLISH COMMUNICATION PRACTICE
LIFE, LANGUAGE AND CULTURE EXPLORATIONS-I

Purpose of the Course: English for Semesters 3 is designed to provide the learners an opportunity to enhance their language skills through a reading of literary texts which will also help them relate themselves to different cultures vis-à-vis their own. Independent reading is also expected to increase spontaneity in expression among the learners.

Objectives: The Course aims at exposing the learners to nuances in culture, inculcating the habit of independent reading which provides the learners an opportunity to develop critical thinking and analytical skills that can be applied to any subject.

Content of the course: The literary pieces are carefully chosen from across cultures as samples of contemporary life and issues of global interest. This is meant to encourage students to relate language to personality development. In all, five stories have been selected for English Communication Practice.

Topics: Culture and traditions, philosophy, familial relationships, ethics, inter-personal relationships, ability to face disaster and poverty, tolerance.

Time frame/Hours of instruction: 2hrs per week (for pre-reading and post reading tasks of the lessons). Total number of hours per semester - 32.

Time Allocation: Reading of the text should be done at home. The class hours are meant for discussion, analysis and related activities. Project should be completed in consultation with the teacher.

Evaluation: The learner will be assessed on a continuous basis by way of projects and work-sheets given at the end of each story.

Stories selected for English Communication Practice
Life, Language and Culture:
1. The Cop and the Anthem by O. Henry
2. The Festival of the Sacred Tooth Relic in Sri Lanka
(based on the Travelogues of FA Hien Compiled by Ashok JainAssisted by Dhurjjati Sarma) **3.The Hawk and the Tree** by Mohammad Azam Rahnaward Zaryab
4. To Be or Not To Be by Zaheda Hina
5. Bade Bhai Saab(My Elder Brother) by Munshi Premchand

Recommended Book: Life, Language and Culture Explorations-I, Cengage Learning India Pvt. Ltd., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

ELECTRONIC CIRCUIT ANALYSIS

Unit I

Single stage Amplifiers : Simplified Common Emitter hybrid model, simplfied calculations for the common collector configuration and common base amplifier, Common emitter amplifier with emitter resistance, Emitter follower, Miller's Theorem and dual of Millers theorem,

FET small signal model, Low frequency common source and common drain amplifiers, FET as Voltage Variable Resistor, Biasing the FET

UNIT- II

Feedback Amplifiers : Classification of Amplifiers, Feedback concept, Transfer Gain with feedback, General characteristics of negative feedback amplifiers, Effect of Feedback on input and output Resistances, Method of Analysis of Feedback Amplifiers, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis

UNIT-III

Oscillators : Condition for oscillations. RC-phase shift oscillators with Transistor and FET with necessary derivation for frequency of oscillation, Hartley and Colpitts oscillators, Wein bridge oscillator, Crystal oscillators, Frequency and amplitude stability of oscillators, Negative Resistance in Oscillator

Unit IV

Multistage Amplifier : Cascading Transistor Amplifiers, Choice of Transistor configuration in Cascade amplifier, High input Resistance Transistor Circuits – Darlington pair, Cascode amplifier, Frequency response and analysis of RC Coupling, Direct coupling and Transformer coupling, Difference amplifier Two Stage RC Coupled JFET amplifiers (in Common Source (CS) configuration).

Unit V

High Frequency Transistor and FET Circuits : Transistor at High Frequencies, Hybrid- π Common Emitter transistor model, Hybrid π conductances, Hybrid π capacitances, Validity of hybrid π model, Variation of Hybrid Parameters, CE short circuit gain, Current gain with resistive load, Single stage CE transistor amplifier response, Gain Bandwidth product, Emitter follower at High frequencies.

FET: Common Source amplifier at Higher Frequencies, and Common Drain Amplifier at High frequencies

Unit VI

Power Amplifiers: Class A large signal Amplifiers, Second harmonic Distortions, Higher order harmonic Distortion, Transformer Coupled Audio power amplifier, Efficiency, Push-pull amplifiers, Class B Amplifiers, Class AB operation, Efficiency of Class B Amplifier, Complementary Symmetry push pull amplifier, Class D amplifier, Class S amplifier, MOSFET power amplifier, Thermal stability and Heat sink

Unit VII

Tuned Amplifiers : Introduction, Q-Factor, Small Signal Tuned Amplifier – Capacitance single tuned amplifier, Double Tuned Amplifiers, Effect of Cascading Single tuned amplifiers on Band width, Effect of Cascading Double tuned amplifiers on Band width, Staggered tuned amplifiers, Stability of tuned amplifiers

Unit VIII

Voltage Regulators : Voltage regulation – Line Regulation, Load Regulation, Types of Regulators, Series voltage regulator , shunt regulators, Overload Voltage protection.

Text Books :

1. Integrated Electronics – J. Millman and C.C. Halkias, Mc Graw-Hill, 1972.

2. Electronic Devices and Circuits - Salivahanan, N.Suressh Kumar, A. Vallavaraj, TATA McGraw Hill, Second Edition

References :

1. Introductory Electronic Devices and Circuits – Robert T. Paynter, Pearson Education, 7th Edition
2. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9th Edition, 2006.

3. Micro Electronic Circuits – Sedra A.S. and K.C. Smith, Oxford University Press, 5th ed.

4. Electronic Circuit Analysis and Design – Donald A. Neaman, Mc Graw Hill.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

CONTROL SYSTEMS

Objective :
In this course it is aimed to introduce to the students the principles and applications of control systems in every day life. The basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

UNIT – I INTRODUCTION
Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.

Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems

UNIT II TRANSFER FUNCTION REPRESENTATION

Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using mason's gain formula.

UNIT-III TIME RESPONSE ANALYSIS

Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

UNIT – IV
STABILITY ANALYSIS IN S-DOMAIN *:* The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's stability
Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT – V
FREQUENCY RESPONSE ANALYSIS : Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT – VI
STABILITY ANALYSIS IN FREQUENCY DOMAIN : Polar Plots, Nyquist Plots Stability Analysis.

UNIT – VII
CLASSICAL CONTROL DESIGN TECHNIQUES : Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

UNIT – VIII

State Space Analysis of Continuous Systems Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability

TEXT BOOKS:

1. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John wiley and son's.,

2. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited,Pub. 2nd edition.

REFERENCE BOOKS:

1. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.
2. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

PULSE AND DIGITAL CIRCUITS

Unit I

Linear wave shaping : High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. RC network as differentiator and integrator, double differentiation, attenuators, RL and RLC circuits and their response for step input, Ringing circuit.

UNIT II

Non – Linear Wave Shaping : Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.

Unit III

Switching Characteristics of Devices: Diode and Transistor as switches, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times.

Digital Logic gate circuits: Realization of Logic Gates using DTL, TTL,ECL and CMOS logic circuits ,Comparison of logic families

Unit IV

Multivibrators: Analysis & Design of Bistable Multivibrators : Fixed bias& self biased transistor binary, Commutating capacitors, Triggering in binary, Schmitt trigger circuit,Applications

UNIT V

Multivibrators(Cotnd.): Analysis & design of Monostable Multivibrator: Collector-coupled and Emitter-coupled Monostable multivibrators, Triggering in monostable multi;

Analysis & design of Astable multivibrator (Collector coupled and Emitter-coupled) using transistors.

UNIT VI

Time Base Generators

General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators.

Unit VII

Synchronization and Frequency Division : Principles of Synchronization, Frequency division in sweep circuit, Astable relaxation circuits, Monostable relaxation circuits, Phase delay&phase jitters;Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit.

Unit VIII

Blocking oscillators & Sampling Gates:

Blocking oscillators: Monostable blocking oscillators (Basetiming& Emitter timing): Astable blocking oscillators (Diode-Controlled & RC controlled), Applications

Sampling gates; Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Reduction of pedestal in gate circuits, Four-diode sampling gates; Applications of sampling gates.

Text Books :

1 . J. Millman and H. Taub, "Pulse, Digital and Switching Waveforms", McGraw-Hill, 1991.

2. A. Anand Kumar, "Pulse and Digital Circuits", PHI, 2005.Second Edition

References :

1. Venkat Rao. K. Ramasudha K, Manmadha Rao G, "Pulse and Digital Circuits," Pearson Education, 2010

2.David J.Comer,"Digital Logic State Machine Design', Oxford University Press,2008,Third Edition

3 MS Prakash Rao – " Pulse and Digital Circuits " Tata McGrawHill

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

SWITCHING THEORY AND LOGIC DESIGN

UNIT I: Review of Number systems:

Representation of numbers of different radix, conversion of numbers from one radix to another radix, r-1's complement and r's complement of unsigned numbers subtraction, problem solving. Signed binary numbers, different forms, problem solving for subtraction. 4-bit codes: BCD, EXCESS 3, alphanumeric codes,9's complement, 2421, etc.. (Text Books: 2,, Reference Books: 1,2,4)

UNIT II

Logic operation, error detection and correction codes: Basic logic operations NOT, OR,AND,Boolean theorems, Complement and dual of logical expressions, NAND and NOR Gates, EX-OR, EX-NOR Gates, standard SOP and POS, Minimisation of logic functions using theorems, Generation of self dual functions. Gray code, error detection and error correction codes, parity checking even parity, odd parity, Hamming code, multi leveled AND-NOR Realisations. Two level NAND-NAND and NOR-NOR realizations. Degenerative forms and multi level realizations. (Text Books: 1,2, Reference Books: 12,4)

UNIT III

Minimisation of switching functions: Minimisation of switching functions using K-Map up to 6-variables, Tabular minimization, minimal SOP and POS Realisation. Problem solving using K-map such as code converters binary multiplier etc.,(Text Books: 1,2 , Reference Books: 2,4)

UNIT IV

Combinational logic circuits-I: Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary adder, 4-bit binary subtractor, adder-subtractor circuit, BCD adder circuit Excess3 adder circuit, look-a-head adder circuit. (Text Books: 2, , Reference Books: 1,2,3)

UNIT V

Combinational logic circuits-II: Design of decoder, Demultiplexer, higher order demultiplexing, encoder, multiplexer, higher order multiplexer, realization of Boolean functions using decoders and multiplexers, priority encoder, different code converter using full adders. (Text Books: 1,2, Reference Books: 1,2,3)

UNIT VI

Combinational logic circuits-III: PROM,PLA,PAL, realization of switching functions using PROM,PLA and PAL; comparison of PROM,PLA,and PAL, Programming tables of PROM,PLA and PAL. (Text Books: 1,2, Reference Books: 1,2,4)

UNIT VII

Sequential circuits I: Classification of sequential circuits (synchronous and asynchronous): basic flip-flops, truth tables and excitation tables (nand RS latch, nor RS latch, RS flip-flop. JK flip-flop, T flip-

flop, D flip-flop with reset and clear terminals).Conversion of flip-flop to flip-flop. Design of ripple counters, design of synchronous counters, Johnson counters, ring counters. Design of registers, Buffer register, control buffer register, shift register, bi-directional shift register, universal shift register. (Text Books: 1,2, Reference Books: 1,2,3)

UNIT VIII

Sequential circuits II: Finite state machine, capabilities and limitations, analysis of clocked sequential circuits, design procedures, reduction of state tables and state assignment. Realization of circuits using various flip-flops. Meelay to Moore conversion and vice-versa. (Text Books: 1 Reference Books: 1,2,4)

TEXTBOOKS:

1. Switching theory and logic design by Hill and Peterson Mc-Graw Hill MH edition
2. Modern Digital Electronics by RP Jain, TMH.

Reference Books:

1. Switching Theory and Logic Design by A. Ananda Kumar
2. Digital design by Mano 2nd edition PHI.
3. Micro electronics by Millman MH edition.
4. Fundamentals of Logic Design by Charles H.Roth Jr, Jaico Publishers.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

EM WAVES AND TRANSMISSION LINES

Review of Coordinate Systems, Vector Calculus :

UNIT I

ELECTROSTATICS: Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Related Problems. Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, Related Problems.

UNIT II

Magneto Statics : Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy. Related Problems.

UNIT III

Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements. Conditions at a Boundary Surface : Dielectric-Dielectric and Dielectric-Conductor Interfaces. Related Problems .

UNIT IV

EM Wave Characteristics - I: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H. Sinusoidal Variations. Wave Propagation in Lossless and Conducting Media. Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics. Polarization. Related Problems.

UNIT V

EM Wave Characteristics – II: Reflection and Refraction of Plane Waves – Normal and Oblique Incidences, for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance. Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor. Related Problems.

UNIT V

Guided Waves : Parallel Plane Waveguides: Introduction, TE, TM, TEM Modes - Concepts and Analysis, Cut-off Frequencies, Velocities, Wavelengths, Wave Impedances. Attenuations Factor – Expression for TEM Case. Related Problems.

UNIT VII

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 Distortionlessness and Minimum Attenuation, Loading - Types of Loading. Related Problems.

UNIT VIII

Transmission Lines – II : Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements; λ/4, λ /2, λ/8 Lines – Impedance Transformations. Smith Chart – Configuration and Applications, Single and Double Stub Matching. Related Problems.

TEXT BOOKS :

1. Elements of Electromagnetic – Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.

REFERENCES :

1. Electromagnetic Fields and Wave Theory –GSN Raju, Pearson Education 2006
2. Engineering Electromagnetics – Nathan Ida, Springer (India) Pvt. Ltd., New Delhi, 2nd ed., 2005.
3. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, TMH, 7th ed., 2006.
4. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2001.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

ANALOG COMMUNICATIONS

UNIT I

INTRODUCTION : 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.

UNIT II

DSB MODULATION : 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 III

SSB MODULATION : Frequency domain description, Frequency discrimination method for generation of AM SSB Modulated Wave, Time domain description, Phase discrimination method for generating AM SSB Modulated waves. Demodulation of SSB Waves, Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Time domain description, Envelope detection of a VSB Wave pulse Carrier, Comparison of AM Techniques, Applications of different AM Systems.

UNIT IV

ANGLE MODULATION : Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Waves, Direct FM, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM & AM.

UNIT V

NOISE : Noise in Analog communication System, Noise in DSB& SSB System, Noise in AM System, Noise in Angle Modulation System, Threshold effect in Angle Modulation System, Pre-emphasis & de-emphasis

UNIT VI

TRANSMITTERS : Radio Transmitter - Classification of Transmitter, AM Transmitter, Effect of feedback on performance of AM Transmitter, FM Transmitter – Variable reactance type and phase modulated FM Transmitter, frequency stability in FM Transmitter.

UNIT VII

RECEIVERS : Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.

UNIT VIII

PULSE MODULATION : Time Division Multiplexing,, Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation & demodulation of PWM, PPM, Generation and demodulation of PPM, TDM Vs FDM

TEXT BOOKS:

1. Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe, TMH, 2007 3rd Edition.
2. Communication Systems – B.P. Lathi, BS Publication, 2006.

REFERENCES:

1. Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.
2. Electronics & Communication System – George Kennedy and Bernard Davis, TMH 2004.
3. Communication Systems– R.P. Singh, SP Sapre, Second Edition TMH, 2007.
4. Fundamentals of Communication Systems - John G. Proakis, Masond, Salehi PEA, 2006.

***

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

ELECTRONIC CIRCUITS & P D C LAB

List of Experiments (Twelve experiments to be done) :

I) Design and Simulation in Simulation Laboratory using Multisim OR Pspice OR Equivalent Simulation Software. & Veryfing the result by Hardware (Any Six):

1. Common Emitter and Common collector amplifier-Freq. response,Impedances measurement
2. Two Stage RC Coupled Amplifier
3. Current shunt and Voltage shunt Feedback Amplifier- Freq. response,Impedances measurement(with and without feedback)
4. Wien Bridge Oscillator using Transistors- Design for different frequencies
5. RC Phase Shift Oscillator using Transistors - Design for different frequencies
6. Class A Power Amplifier (with and without transformer load)
7. Class B Power Amplifier
8. Single Tuned Voltage Amplifier
9. Series Voltage Regulator
10. Shunt Voltage Regulator

II) Pulse and Digital Circuits (Any Six)- By designing the Circuit

1. Linear wave shaping (Diff. Time Constants, Differentiator, Integrator)
2. Non Linear wave shaping – Clippers.,Clampers
3. Logic gates with discrete components (Diodes, Transistors)
4. Bistable Multivibrator
5. Astable Multivibrator. (Voltage- Frequency convertor)
6. Monostable Multivibrator.
7. Schmitt Trigger.
8. UJT Relaxation Oscillator.
9. Bootstrap sweep circuit.
10. Sampling Gates

Equipments required for Laborataries:

i. For software simultation of Electronic circuits
   - i) Computer Systems with latest specifications
   - ii) Connected in Lan (Optional)
   - iii) Operating system (Windows XP)
   - iv) Simulations software (Multisim/TINAPRO) Package

Equipment:

1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Components
5. Multimeters

2010-11

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
B.TECH. (ELECTRONICS AND COMMUNICATION ENGINEERING)

II B.Tech. II Sem.

ANALOG COMMUNICATIONS LAB

List of Experiments (Twelve experiments to be done) - (a. Hardware, b.MATLAB Simulink, c. MATLAB Communication tool box)

A. Amplitude Modulation - Mod. & Demod.
B. AM - DSB SC - Mod. & Demod.
C. Spectrum Analysis of Modulated signal using Spectrum Analyser
D. Diode Detector
E. Pre-emphasis & De-emphasis
F. Frequency Modulation - Mod. & Demod.
G. AGC Circuits
H. Sampling Theorem
I. Pulse Amplitude Modulation - Mod. & Demod.
J. PWM , PPM - Mod. & Demod.
K. PLL

Equipments & Software required:

Software :

i.) Computer Systems with latest specifications
ii) Connected in Lan (Optional)
iii) Operating system (Windows XP)
iv) Simulations software (Simulink & MATLAB)

Equipment:

1. RPS	-	0 – 30 V
2. CRO	-	0 – 20 M Hz.
3. Function Generators	-	0 – 1 M Hz

4. Components
5. Multimeters
6. Spectrum Analyser

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

LINEAR IC APPLICATIONS

UNIT I

INTEGRATED CIRCUITS : Differential Amplifier- DC and AC analysis of Dual input Balanced output Configuration, Properties of other differential amplifier configuration (Dual Input Unbalanced Output, Single Ended Input – Balanced/ Unbalanced Output), DC Coupling and Cascade Differential Amplifier Stages, Level translator.

UNIT II

Characteristics of OP-Amps, Integrated circuits-Types, Classification, Package Types and temperature ranges, Power supplies, Op-amp Block Diagram, ideal and practical Op-amp specifications, DC and AC characteristics, 741 op-amp & its features, FET input. Op-Amps, Op-Amp parameters & Measurement, Input & Out put Off set voltages & currents, slew rates, CMRR, PSRR, drift, Frequency Compensation technique.

UNIT III

LINEAR APPLICATIONS OF OP- AMPS : Inverting and Non-inverting amplifier, Integrator and differentiator, Difference amplifier, Instrumentation amplifier, AC amplifier, V to I, I to V converters, Buffers.

UNIT IV

NON-LINEAR APPLICATIONS OF OP- AMPS: Non- Linear function generation, Comparators, Multivibrators, Triangular and Square wave generators, Log and Anti log amplifiers, Precision rectifiers.

UNIT V

ACTIVE FILTERS: Introduction, Butter worth filters – 1st order, 2nd order LPF, HPF filters. Band pass, Band reject and All pass filters.

UNIT VI

TIMERS & PHASE LOCKED LOOPS: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK demodulators. Applications of VCO (566).

UNIT VII

D to A & A to D CONVERTERS : Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC Specifications, Specifications AD 574 (12 bit ADC).

UNIT VIII

ANALOG MULTIPLIERS AND MODULATORS : Four Quadrant multiplier, balanced modulator,IC1496,Applications of analog switches and Multiplexers, Sample & Hold amplifiers.

TEXT BOOKS :

1. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition,2003.
2. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI,1987.

REFERENCES :

1. Design with Operational Amplifiers & Analog Integrated Circuits - Sergio Franco, McGraw Hill, 1988.
2. OP AMPS and Linear Integrated Circuits concepts and Applications, James M Fiore, Cenage Learning India Ltd.
3. Operational Amplifiers & Linear Integrated Circuits–R.F.Coughlin & Fredrick Driscoll, PHI, 6th Edition.
4. Operational Amplifiers – C.G. Clayton, Butterworth & Company Publ.Ltd./ Elsevier, 1971.
5. Operational Amplifiers & Linear ICs – David A Bell, Oxford Uni. Press, 3rd Edition
6. Linear Integrated Circuits – S Salivahana, VSK Bhaskaran TMH, 2008.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

COMPUTER ARCHITECTURE & ORGANAGATION

Unit 1:
Computer System:
Computer components, computer function, interconnection structures, Bus interconnection, arithmetic and logic unit, integer representation, integer arithmetic, fixed point representation, floating point representation.

Unit 2:
Central Processing Unit:
Instruction Sets: Characteristics and addressing modes – Machine instruction characteristics, Types of operands and operators, addressing modes, instruction formats, Assembly language
Process Structure and Functions – Process organization, register organization, instruction cycle, instruction pipelining.

Unit 3:
Control Unit and Micro Programmed Control:
Micro operations, control of the processor, hardwired implementation, micro programmed control, micro instruction sequencing, micro instruction execution,

Unit 4:
Computer Arithmetic:
Addition and subtraction, multiplication algorithms, division algorithms, floating point arithmetic operations, decimal arithmetic unit, decimal arithmetic operations.

Unit 5:
The Memory System:
Memory Hierarchy, main memory, auxiliary memory, associative memory, cache memory and Cache organisation, virtual memory, memory management hardware.

Unit 6:
Input Output Organization:
Peripheral devices, input-output interface, asynchronous data transfer modes of transfer, priority interrupt, direct memory access, input-output processor (IOP), serial communication.

Unit 7:
Parallel Organization:
Parallel Processing – use of multiprocessors, symmetric multi processors, cache coherence and MESI protocol, multi-threading and chip multiprocessors, non-uniform memory access computers, vector computations.

Unit 8:
Multiprocessors – Characteristics of multiprocessors, interconnection structures, inter processor arbitration, inter process arbitration, interprocessor communication and synchronization.

Text Books:

1. Computer System Architecure, 3/e, M. Morris Mano, Pearson.
2. Computer Organization and Architecure, 8/e, William Stallings, Pearson.

References:

1. Computer Organization, 5/e, Hamachar, Vranesic, TMH.
2. Computer Organization and Architecture, V. Rajaraman, T. Radhakrishnan, PHI Learning.
2. Computer Organization and Design, Pal Choudary, PHI.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

DIGITAL IC APPLICATIONS

UNIT I

CMOS LOGIC: Introduction to logic families, CMOS logic, CMOS steady state electrical behaviour, CMOS dynamic electrical behaviour, CMOS logic families.

UNIT II

BIPOLAR LOGIC AND INTERFACING: Diode Logic, Bipolar logic, Transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs – Specifications.

UNIT III

COMBINATIONAL LOGIC DESIGN-I: Introduction, Design and Analysis procedures, Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, EX-OR gates and parity circuits, comparators, adders & sub tractors, Design considerations of the above combinational logic circuits with relevant Digital ICs.

UNIT IV

COMBINATIONAL LOGIC DESIGN-II: Ripple Adder, Look Ahead Carry Generator, Binary Parallel Adder, n-Bit Parallel Subtractor, Binary Adder-Subtractor**,** ALUs, Combinational multipliers, Barrel Shifter, Simple Floating-Point Encoder, Cascading Comparators, Dual Priority Encoder, Design considerations of the above combinational logic circuits with relevant Digital ICs.

UNIT V

SEQUENTIAL LOGIC DESIGN-I: Introduction, The Basic Bistable Element, Latches, and flip-flops, Flip-Flop Conversions, SSI Latches and Flip-Flops, Counters, Design of Counters using Digital ICs, Counter applications, Synchronous design methodology, Impediments to synchronous design, Design considerations of the above sequential logic circuits with relevant Digital ICs.

UNIT VI

SEQUENTIAL LOGIC DESIGN-II: MSI Registers, Shift Registers, Modes of Operation of Shift Registers, Universal Shift Registers, MSI Shift Registers, Ring Counter, Johnson Counter, Basic sequential logic Design steps, Design of Modulus N Synchronous Counters, Design considerations of the above sequential logic circuits with relevant Digital ICs.

UNIT VII

PROGRAMMABLE LOGIC DEVICES (PLDs): Introduction, Programmable Read Only Memory, Programmable Logic Array, Programmable Array Logic Devices, Comparison between PROM, PLA and PAL. Design considerations of PLDs with relevant Digital ICs.

UNIT-VIII

MEMORIES: ROM: Internal structure, 2D-Decoding, Commercial ROM types, timing and applications,. Static RAM: Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS, Dynamic RAM: Internal structure, timing, synchronous DRAMs, Familiarity with Component Data Sheets-Cypress CY6116, CY7C1006, Specifications.

TEXT BOOKS:

1. Digital Design Principles & Practices By John F. Wakerly, PHI Publications,Third Edition., 2005.
2. Digital IC Applications By Atul P.Godse and Deepali A.Godse, Technical Publications, Pune, 2005.

REFERENCES :

1. Digital Integrated Circuits-A Design Perspective By Jan M.Rabaey, Anantha Chandrakasan, Borivoje Nikolic, Pearson Education, 2005.
2. Introduction to Logic Design – Alan B. Marcovitz,TMH, 2nd Edition,2005.
3. Digital Logic and Computer Design By Mano, Pearson Education.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

DIGITAL COMMUNICATIONS

UNIT I

PULSE DIGITAL MODULATION : Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error, Compading in PCM systems. Differential PCM systems (DPCM).

UNIT II

DELTA MODULATION : Delta modulation, its draw backs, adaptive delta modulation, comparison of PCM and DM systems, noise in PCM and DM systems.

UNIT III

DIGITAL MODULATION TECHNIQUES : Introduction, ASK, FSK, PSK, DPSK, DEPSK, QPSK, M-ary PSK, ASK, FSK, similarity of BFSK and BPSK.

UNIT IV

DATA TRANSMISSION : Base band signal receiver, probability of error, the optimum filter, matched filter, probability of error using matched filter, coherent reception, non-coherent detection of FSK, calculation of error probability of ASK, BPSK, BFSK,QPSK.

UNIT V

INFORMATION THEORY : Discrete messages, concept of amount of information and its properties. Average information, Entropy and its properties. Information rate, Mutual information and its properties,

UNIT VI

SOURCE CODING : Introductions, Advantages, Shannon's theorem, Shanon-Fano coding, Huffman coding, efficiency calculations, channel capacity of discrete and analog Channels, capacity of a Gaussian channel, bandwidth –S/N trade off.

UNIT VII

LINEAR BLOCK CODES : Introduction, Matrix description of Linear Block codes, Error detection and error correction capabilities of Linear block codes, Hamming codes, Binary cyclic codes, Algebraic structure, encoding, syndrome calculation, BCH Codes.

UNIT VIII

CONVOLUTION CODES : Introduction, encoding of convolution codes, time domain approach, transform domain approach. Graphical approach: state, tree and trellis diagram decoding using Viterbi algorithm.

TEXT BOOKS :

1. Digital communications - Simon Haykin, John Wiley, 2005
2. Principles of Communication Systems – H. Taub and D. Schilling, TMH, 2003

REFERENCES :

1. Digital and Analog Communication Systems - Sam Shanmugam, John Wiley, 2005.
2. Digital Communications – John Proakis, TMH, 1983. Communication Systems Analog & Digital – Singh & Sapre, TMH, 2004.
3. Modern Analog and Digital Communication – B.P.Lathi, Oxford reprint, 3rd edition, 2004.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

ANTENNAS AND WAVE PROPAGATION

UNIT I

ANTENNA FUNDAMENTALS : Introduction, Radiation Mechanism – single wire, 2 wire, dipoles, Current Distribution on a thin wire antenna . Antenna Parameters] - Radiation Patterns, Patterns in Principal Planes, Main Lobe and Side Lobes, Beamwidths, Beam Area, Radiation Intensity, Beam Efficiency, Directivty, Gain and Resolution, Antenna Apertures, Aperture Efficiency, Effective Hight. Related Problems.

UNIT II

Thin Linear Wire Antennas: Retarded Potentials, Radiation from Small Electric Dipole, Quarterwave Monopole and Halfwave Dipole – Current Distributions, Evaluation of Field Components, Power Radiated, Radiation Resistance, Beamwidths, Directivity, Effective Area and Effective Hight. Natural current distributions, fields and patterns of Thin Linear Center-fed Antennas of different lengths, Radiation Resistance at a point which is not current maximum. Antenna Theorems – Applicability and Proofs for equivalence of directional characteristics, Loop Antennas: Small Loops - Field Components, Comparison of far fields of small loop and short dipole, Concept of short magnetic dipole, D and Rr relations for small loops.

UNIT III

ANTENNA ARRAYS : 2 element arrays – different cases, Principle of Pattern Multiplication, N element Uniform Linear Arrays – Broadside, Endfire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison; Concept of Scanning Arrays. Directivity Relations (no derivations). Related Problems. Binomial Arrays, Effects of Uniform and Non uniform Amplitude Distributions, Design Relations.

UNIT IV

NON-RESONANT RADIATORS : Introduction, Travelling wave radiators – basic concepts, Longwire antennas – field strength calculations and patterns, V-antennas, Rhombic Antennas and Design Relations, Broadband Antennas: Helical Antennas – Significance, Geometry, basic properties; Design considerations for monofilar helical antennas in Axial Mode and Normal Modes (Qualitative Treatment).

UNIT V

VHF, UHF AND MICROWAVE ANTENNAS - I : Arrays with Parasitic Elements, Yagi - Uda Arrays, Folded Dipoles & their characteristics. Reflector Antennas : Flat Sheet and Corner Reflectors. Paraboloidal Reflectors – Geometry, characteristics,types of feeds, F/D Ratio, Spill Over, Back Lobes, Aperture Blocking, Off-set Feeds, Cassegrainian Feeds].

UNIT VI

VHF, UHF AND MICROWAVE ANTENNAS - II : Horn Antennas – Types, Optimum Horns, Design Characteristics of Pyramidal Horns; Lens Antennas – Geometry, Features, Dielectric Lenses and Zoning, Applications. Antenna Measurements – Patterns Required, Set Up, Distance Criterion, Directivity and Gain Measurements (Comparison, Absolute and 3-Antenna Methods).

UNIT VII

WAVE PROPAGATION - I: Concepts of Propagation – frequency ranges and types of propagations. Ground Wave Propagation–Characteristics, Parameters, Wave Tilt, Flat and Spherical Earth Considerations. Sky Wave Propagation – Formation of Ionospheric Layers and their Characteristics, Mechanism of Reflection and Refraction, Critical Frequency, MUF & Skip Distance – Calculations for flat and spherical earth cases, Optimum Frequency, LUHF, Virtual Height, Ionospheric Abnormalities, Ionospheric Absorption.

UNIT VIII

WAVE PROPAGATION – II: Fundamental Equation for Free-Space Propagation, Basic Transmission Loss Calculations. Space Wave Propagation – Mechanism, LOS and Radio Horizon. Tropospheric Wave Propagation – Radius of Curvature of path, Effective Earth's Radius, Effect of Earth's Curvature, Field Strength Calculations, M-curves and Duct Propagation, Tropospheric Scattering.

TEXT BOOKS :

1. Antennas for All Applications – John D. Kraus and Ronald J. Marhefka, TMHl, 3rd Edn., 2003.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

REFERENCES :

1. Antenna Theory - C.A. Balanis, John Wiley & Sons, 2nd ed., 2001.
2. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
3. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
4. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th edition, 1955.
5. Antennas – John D. Kraus, McGraw-Hill, SECOND EDITION, 1988.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

UNIT I

Performance characteristics of instruments, Static characteristics, Accuracy, Resolution, Precision, Expected value, Error, Sensitivity. Errors in Measurement, Dynamic Characteristics-speed of response, Fidelity, Lag and Dynamic error. DC Voltimeters- Multirange, Range extension/Solid state and differential voltmeters, AC voltmeters- multi range, range extension, shunt. Thermocouple type RF ammeter, Ohmmeters series type, shunt type, Multimeter for Voltage, Current and resistance measurements.

UNIT II

Signal Generator- fixed and variable, AF oscillators, Standard and AF sine and square wave signal generators, Function Generators, Square pulse, Random noise, sweep, Arbitrary waveform.

UNIT III

Wave Analyzers, Haromonic Distortion Analyzers, Spectrum Analyzers, Digital Fourier Analyzers.

UNIT IV

Oscilloscopes CRT features, vertical amplifiers, horizontal deflection system, sweep, trigger pulse, delay line, sync selector circuits, simple CRO, triggered sweep CRO, Dual beam CRO, Measurement of amplitude and frequency.

UNIT V

Dual trace oscilloscope, sampling oscilloscope, storage oscilloscope, digital readout oscilloscope, digital storage oscilloscope, Lissajous method of frequency measurement, standard specifications of CRO, probes for CRO- Active & Passive, attenuator type, Frequency counter, Time and Period measurement.

UNIT VI

AC Bridges Measurement of inductance- Maxwell's bridge, Anderson bridge. Measurement of capacitance - Schearing Bridge. Wheat stone bridge. Wien Bridge, Errors and precautions in using bridges. Q-meter.

UNIT VII

Transducers- active & passive transducers : Resistance, Capacitance, inductance; Strain gauges, LVDT, Piezo Electric transducers, Resistance Thermometers, Thermocouples, Thermistors, Sensistors.

UNIT VIII

Measurement of physical parameters force, pressure, velocity, humidity, moisture, speed, proximity and displacement. Data acquisition systems.

TEXTBOOKS :

1. Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.
2. Modern Electronic Instrumentation and Measurement Techniques – A.D. Helfrick and W.D. Cooper, PHI,5th Edition, 2002.

REFERENCES :

1. Electronic Instrumentation & Measurements - David A. Bell, PHI, 2nd Edition, 2003.
2. Electronic Test Instruments, Analog and Digital Measurements - Robert A.Witte, Pearson Education, 2nd Ed., 2004.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

DIGITAL COMMUNICATIONS LAB

1. Time division multiplexing.
2. Pulse code modulation.
3. Differential pulse code modulation.
4. Delta modulation.
5. Frequency shift keying.
6. Phase shift keying .
7. Differential phase shift keying.
8. Companding
9. Source Encoder and Decoder
10. Linear Block Code-Encoder and Decoder
11. Binary Cyclic Code - Encoder and Decoder
12. Convolution Code - Encoder and Decoder

Equipment required for Laboratories:

1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. RF Generators - 0 – 1000 M Hz./0 – 100 M Hz.
5. Multimeters
6. Lab Experimental kits for Digital Communication
7. Components
8. Radio Receiver/TV Receiver Demo kits or Trainees.

***

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electronics and Communication Engineering – I Sem.

IC APPLICATIONS LAB

Minimum Twelve Experiments to be conducted :

1. Study of OP AMPs – IC 741, IC 555, IC 565, IC 566, IC 1496 – functioning, parameters and Specifications.
2. OP AMP Applications – Adder, Subtractor, Comparator Circuits.
3. Integrator and Differentiator Circuits using IC 741.
4. Active Filter Applications – LPF, HPF (first order)
5. Active Filter Applications – BPF, Band Reject (Wideband) and Notch Filters.
6. IC 741 Oscillator Circuits – Phase Shift and Wien Bridge Oscillators.
7. Function Generator using OP AMPs.
8. IC 555 Timer – Monostable Operation Circuit.
9. IC 555 Timer – Astable Operation Circuit.
10. Schmitt Trigger Circuits – using IC 741 and IC 555.
11. IC 565 – PLL Applications.
12. IC 566 – VCO Applications.
13. Voltage Regulator using IC 723.
14. Three Terminal Voltage Regulators – 7805, 7809, 7912.
15. 4 bit DAC using OP AMP.

Equipment required for Laboratories:

1. RPS
2. CRO
3. Function Generator
4. Multi Meters
5. IC Trainer Kits (Optional)
6. Bread Boards
7. Components:- IC741, IC555, IC565, IC1496, IC723, 7805, 7809, 7912 and other essential components.
8. Analog IC Tester

***

INTELLECTUAL PROPERTY RIGHTS AND PATENTS – 1

Unit 1 Introduction to Intellectual Property Law – The Evolutionary Past - The IPR Tool Kit- Para -Legal Tasks in Intellectual Property Law – Ethical obligations in Para Legal Tasks in Intellectual Property Law - Introduction to Cyber Law – Innovations and Inventions Trade related Intellectual Property Right

Unit 2 Introduction to Trade mark – Trade mark Registration Process – Post registration procedures – Trade mark maintenance - Transfer of Rights - Inter partes Proceeding – Infringement - Dilution Ownership of Trade mark – Likelihood of confusion - Trademarks claims – Trade marks Litigations – International Trade mark Law –

Unit 3 Introduction to Copyrights – – Principles of Copyright Principles -The subjects Matter of Copy right – The Rights Afforded by Copyright Law – Copy right Ownership, Transfer and duration – Right to prepare Derivative works – Rights of Distribution – Rights of Perform the work Publicity Copyright Formalities and Registrations - Limitions - Copyright disputes and International Copyright Law – Semiconductor Chip Protection Act

Unit 4 Introduction to Trade Secret – Maintaining Trade Secret – Physical Secrurity – Employee Limitation - Employee confidentiality agreement - Trade Secret Law - Unfair Competation – Trade Secret Letigation – Breach of Contract – Applying State
Law

Books:

1. Deborah E.Bouchoux: "Intellectual Property". Cengage learning , New Delhi
2. Kompal Bansal & Parishit Bansal "Fundamentals of IPR for Engineers", BS Publications (Press)
3. Cyber Law. Texts & Cases, South-Western's Special Topics Collections
4. Prabhuddha Ganguli: ' Intellectual Property Rights" Tata Mc-Graw –Hill, New Delhi
5. Richard Stim: "Intellectual Property", Cengage Learning, New Delhi.
6. R.Radha Krishnan, S.Balasubramanian: "Intellectual Property Rights", Excel Books. New Delhi
7. M.Ashok Kumar and Mohd.Iqbal Ali: "Intellectual Property Right" Serials Pub.

INTELLECTUAL PROPERTY RIGHTS AND PATENTS – II

Unit 1 Intellectual Property Law Basics – Types of Intellectual Property – Agencies responsible for Intellectual Property Regristration - Cyber crime and E-commerce – International Aspects of Computer and Online Crime

Unit 2 Introduction to Patent Law – Rights and Limitations – Rights under Patent Law – Patent requirements - Ownership - Transfer - Patents Application Process – Patent
Infringement - Patent Litigation - International Patent Law – Double Patenting –
Patent Searching – Patent Law Treaty - New developments in Patent Law - Invention
Developers and Promoters

Unit 3 Introduction to Transactional Law: Creating Wealth and Managing Risk – The Employment Relationship in the Internet and Tech Sector – Contact for the Internet and Tech Sector - Business Assets in Information Age – Symbol and Trademark – Trolls and Landmines and other Metaphors

Unit 4 Regulatory , Compliance and Liability Issues – State Privacy Law - Date Security –
Privacy issues - Controlling Over use or Misuse of 1 Intellectual Property Rights

Books:

1. Deborah E.Bouchoux: "Intellectual Property". Cengage learning , New Delhi
2. Kompal Bansal & Parishit Bansal "Fundamentals of IPR for Engineers", BS Publications (Press)
3. Cyber Law. Texts & Cases, South-Western's Special Topics Collections
4. Prabhuddha Ganguli: ' Intellectual Property Rights" Tata Mc-Graw –Hill, New Delhi
5. Richard Stim: "Intellectual Property", Cengage Learning, New Delhi.
6. R.Radha Krishnan, S.Balasubramanian: "Intellectual Property Rights", Excel Books. New Delhi
7. M.Ashok Kumar and Mohd.Iqbal Ali: "Intellectual Property Right" Serials Pub.