

SRI KRISHNADEVARAYA UNIVERSITY :: ANANTAPURAM
College of Engineering & Technology
Academic Regulations 2018 (R18) for
B. Tech (Regular-Full time)

(With effect from the Academic Year 2018-19 for the students admitted into I year I semester)

1. Award of B.Tech. Degree

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

- i. Regular entry students shall pursue a course of study for not less than four academic years and in not more than eight academic years. However, for the students availing Gap year facility, this period shall be extended up to 2 years at the most and these two years would not be counted for the maximum time for graduation.
- ii. Regular entry students shall register for **182 credits** and should secure a minimum of **176 credits**.
- iii. Lateral entry students shall pursue a course of study for not less than three academic years and in not more than six academic years. However, for the students availing Gap year facility this period shall be extended up to 2 years at the most and these two years would not be counted for the maximum time for graduation.
- iv. Lateral entry students shall register for **140 credits** and should secure a minimum of **134 credits**.
- v. Regular Students, who fail to fulfil all the academic requirements for the award of the degree within Eight (Ten for GAP year students) academic years from the year of their admission, shall forfeit their seat in B.Tech course and their admission stands cancelled.
- vi. Lateral Students, who fail to fulfil all the academic requirements for the award of the degree within Six (Eight for GAP year students) academic years from the year of their admission, shall forfeit their seat in B.Tech course and their admission stands cancelled.
- vii. **Compulsory Subjects:**(Which the student has to register and get through)
 1. All Theory Subjects of 3 credits each.
 2. All Laboratory courses of 2 credits each.
 3. Seminar
 4. Mini Project
 5. Project.
 6. All Audit Courses.(Human values, professional ethics and Comprehensive Online Examinations)
 7. Community Service
 8. Open Elective.

Optional Subjects: Which the student shall register and can forfeit any two out of three of the following

1. Comprehensive Online Examinations.
2. MOOC's-I
3. MOOC's-II

2. Courses of study

The following courses of study are offered at present under B. Tech. program with effect from the academic year 2018-19

S. No.	Branch
01.	Civil Engineering
02.	Computer Science & Engineering
03.	Electrical and Electronics Engineering
04.	Electronics and Communication Engineering
05.	Mechanical Engineering

and any other course as approved by the authorities of the University from time to time.

The entire course of study is of four academic years in semester pattern (for regular students) and of three academic years in semester pattern (for lateral entry students).

3. Credits

	Semester	
	Periods/Week	Credits
Theory	04	03
Practical	04	02
Drawing	03	-
	03	03
Online examination	-	-
Project	7	5

4. Course pattern:

- i. The entire course of study is of four academic years on semester pattern.
- ii. A student eligible to appear for the end examination in a subject, but absent in it or has failed in the end examination may appear for that subject at the next supplementary examination offered.
- iii. When a student is detained due to lack of credits / shortage of attendance, he may be re-admitted when the semester / year is offered next after fulfilment of academic regulations.

5. Distribution and Weightage of Marks

- i. The performance of a student in each semester for academic years I, II, III, IV shall be evaluated subject wise with a maximum of 100 marks for theory and 75 marks for practicals. In addition to the subjects and labs Mini Project, Seminar, Comprehensive Viva Voce and Project Work shall be evaluated for 50, 50, 100 and 150 marks respectively.
- ii. For theory / Engineering Drawing/Graphics course subjects the distribution shall be 30 marks for Internal Evaluation (30 marks for internal test:20 marks for descriptive and 10 marks for objective questions) and 70 marks for the External Examination.
- iii. For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination consists of descriptive and multiple choice questions for 30 marks with a duration of 1 hour 30 minutes.

First midterm examination shall be conducted for the first half of the syllabus in the middle of the semester and second midterm examination shall be conducted for the second half of the syllabus towards the end of the semester. A weightage of 0.75 for better score and 0.25 for the other score will be considered for awarding the sessional marks in both the midterm examinations.

- iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Day-to-day work in the laboratory shall be evaluated for 25 marks by the concerned laboratory teacher based on the report of experiments/jobs. The end examination shall be conducted by the teacher handling the laboratory and another internal examiner.
- v. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department before presentation. The report and the presentation shall be evaluated by the Departmental committee consisting of Head of the

department, seminar supervisor and a senior faculty member. The seminar shall be evaluated for 50 marks. There shall be no external examination for seminar.

- vi. There shall be two comprehensive online examinations conducted internally, one in II-II and another in III-II. A student is supposed to secure minimum of 35% marks to secure 2 credits to pass. However credits will not be awarded.
- vii. There shall be one open Elective (for same and other branch students), in III-II. Each department shall offer a minimum of 3 subjects in such courses. A student shall be given a choice to select any one subject from the list of subjects offered by all faculties under open elective.
- viii. Massive Open Online Courses (MOOCs) are to be introduced. There shall be two MOOCs in the entire course duration.
- ix. These MOOCs included in the Course structure in the IV Year II Semester. The Student shall register for any MOOCs program offered by NPTEL or any other agency approved by the University. The MOOCs program registered by the student shall be relevant to his field of study and shall be approved by the Head of the Department.
- x. The evaluation of mini project work shall be conducted at the end of the IV year I Semester. The End Semester Examination shall be conducted by the Board of Examiners consisting of Department staff, Project Supervisor, Head of the Department.
- xi. Out of a total of 150 marks for the project work, 50 marks shall be for Internal Evaluation and 100 marks for the external viva-voce in the End Semester Examination. The End Semester Examination shall be conducted by the Board of Examiners consisting of Project Supervisor, Head of the Department and an External Examiner. The evaluation of project work shall be conducted at the end of the IV year II Semester. The Internal Evaluation shall be on the basis of two seminars of each 25 marks, one will be presented to the project supervisor and other will be presented to the Department committee comprising Head of the Department, Project Supervisor, and one senior faculty of the Department.
- xii. The comprehensive Viva Voce will be conducted by the Board of Examiners at the time of evaluation of the Project Work, to test the overall subject knowledge of the entire course.

6. Attendance Requirements:

- i. A student shall be eligible to appear for University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in each semester of that year.
- ii. Shortage of Attendance below 62% in aggregate shall in NO case be condoned.
- iii. Shortage of attendance in aggregate up to 13% (62% and above and below 75%) in each semester may be granted by the College Academic Committee valid on Genuine grounds with supporting evidence.
- iv. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
- v. A student will not be promoted to the next semester unless he/she satisfies the attendance requirements of the present semester, as applicable. They may seek re-admission for that semester when offered next.
- vi. A stipulated fee shall be payable towards condonation of shortage of attendance to the University.

7. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No.6

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, drawing subject or project if he/she secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together. For the Seminar he should secure 40% in the internal evaluation.
- ii. A student shall be promoted from II to III year only if he/she fulfils the academic requirement of securing **35** credits from the preceding regular and supplementary examinations.
- iii. A student shall be promoted from third year to fourth year only if he/she fulfils the academic requirements of securing **58** credits from the preceding regular and supplementary examinations.
- iv. Lateral Entry students shall be promoted from third year to fourth year only if he/she fulfils the academic requirements of securing **35 credits** from the preceding regular and supplementary examinations.
- v. Regular students who fail to earn 176 credits as indicated in the course structure within eight academic years (10 years for Gap year students) from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.
- vi. Lateral entry students who fail to earn 134 credits as indicated in the course structure within six academic years (8 years for Gap year students) from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.

8. Transitory Regulations:

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to Section 1.1.

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, and they will be in the academic regulations into which the candidate is presently readmitted.

Candidate who were permitted with GAP year shall be eligible for rejoining into the succeeding year of their B.Tech from the commencement of class work and they will be in the academic regulations into which the candidate is presently rejoining.

9. With-holding of results:

If the candidate has any dues not paid to the College or if any case of indiscipline or malpractice is pending against him/her, the result of the candidate shall be withheld and he/she will not be allowed / promoted into the next higher semester. The issue of awarding degree is liable to be withheld in such cases.

10. GAP Year: Concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time

after II year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The Head of the respective department shall forward such proposals submitted by the students to the College. An evaluation committee shall be constituted by the College to evaluate the proposal submitted by the student and the committee shall decide whether or not to permit student(s) to avail the Gap Year.

11. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

Class Awarded	% of marks to be secured
First Class with Distinction	70% and above
First Class	Below 70% but not less than 60%
Second Class	Below 60% but not less than 50%
Pass Class	Below 50% but not less than 40%

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum). If any candidate passes through supplementary examinations beyond the duration of the course, he/she may be awarded class based on the % of marks secured as above, except distinction.

- i. Grading System is to be introduced. After each subject is evaluated for 100 marks, the marks obtained in each subject will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

Table – Conversion into Grades and Grade Points assigned

Range in which the marks in the subject fall	Grade	Grade points Assigned
≥ 90	S (Superior)	10
80-89	A+ (Excellent)	9
70-79	A (Very Good)	8
60-69	B (Good)	7
50-59	C (Average)	6
40-49	D (Satisfactory)	5
< 40	F (Fail)	0
Absent	Ab (Absent)	0

12. The minimum instruction days including exams for each semester shall be 90 days.
13. There shall be no branch transfers after the completion of admission process.
14. The academic regulations should be read as a whole for purpose of any interpretation.
15. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the University is final.
16. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on roles with effect from the dates notified..

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Electronics and Communication Engineering

S.No.	Course Code	Subject	L	T	P	Credits
1.	FE	Functional English	3	1	-	3
2.	M-I	Mathematics	3	1	-	3
3.	EP	Engineering Physics	3	1	-	3
4.	PPS	Programming for Problem Solving	3	1	-	3
5.	EG	Engineering Graphics	3	1		3
6.	PHYL	Physics Lab	-		4	2
7.	PROGL	Programming Lab	-		4	2
8.	EW&ITL	Engineering Workshop & IT Workshop Lab	-		4	2
		TOTAL	15	5	12	21

B. Tech, I- Year: I- Semester

Course Structure

L–Lecture, T–Tutorial, P -Practical

B. Tech, I- Year: II- Semester

Course Structure

S.No.	Course Code	Subject	L	T	P	Credits
1.	CE	Communicative English	3	1	-	3
2.	M-II	Mathematical Methods	3	1	-	3
3.	EC	Engineering Chemistry	3	1	-	3
4.	DS	Data Structures	3	1	-	3
5.	DLD	Network Analysis and Synthesis	3	1	-	3
6.	CSL	Communication Skills Lab	-		4	2
7.	CHEML	Chemistry Lab	-		4	2
8.	DSL	Data Structures using C++ Lab	-		4	2
		TOTAL	15	5	12	21

L–Lecture, T–Tutorial, P -Practical

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Electronics and Communication Engineering

B.Tech, II- Year: I- Semester

Course Structure

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	CA	Complex Analysis	3	1	-	3
2.	ET	Electrical Technology	3	1	-	3
3.	EDC	Electronic Devices And Circuits	3	1	-	3
4.	SS	Signals And Systems	3	1	-	3
5.	STLD	Switching Theory and Logic Design	3	1	-	3
6.	OOPJ	Object Oriented Programming through JAVA	3	1	-	3
7.	EDCL	Electronic Devices & Circuits Lab	-	-	4	2
8.	ETL	Electrical Engineering Lab	-	-	4	2
9.	HVPE	Human Values and Professional Ethics	2			
		TOTAL	20	6	8	22

L–Lecture, T–Tutorial, P -Practical

II Year: II- Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	MEFA	Managerial Economics & Financial Analysis	3	1	-	3
2.	PDC	Pulse and Digital Circuits	3	1	-	3
3.	EMTL	EM Waves And Transmission Lines	3	1	-	3
4.	ECA	Electronic Circuit Analysis	3	1	-	3
5.	ES	Environmental Science	3	1	-	3
6.	PTSP	Probability Theory & Stochastic Processes	3	1	-	3
7.	ECAL	Electronic Circuit Analysis Lab	-	-	4	2
8.	PDCL	Pulse and Digital Circuits Lab	-	-	4	2
9.	COE-I	Comprehensive Online Examination-1	-	-	-	-
		TOTAL	18	6	8	22

L–Lecture, T–Tutorial, P -Practical

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Electronics and Communication Engineering

B.Tech: III- Year, I- Semester

S.No	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	AC	Analog Communications	3	1	-	3
2.	CS	Control Systems	3	1	-	3
3.	AWP	Antennas And Wave Propagation	3	1	-	3
4.	AICA	Analog IC Applications	3	1	-	3
5.	DICA	Digital IC Applications	3	1	-	3
6.	MPMC	Microprocessors & Microcontrollers	3	1	-	3
7.	AICA&DICA LAB	Analog & Digital IC Applications Lab	-	-	4	2
8.	MPMCL	Microprocessors and Microcontrollers lab	-	-	4	2
9.	ACSP	Advanced Communications Skills Practice	-	-	3	-
10	CMS	Community Service	-	-	-	2
TOTAL			18	6	11	24

L–Lecture, T–Tutorial, P -Practical

III Year II Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	DSP	Digital Signal Processing	3	1	-	3
2.	EMI	Electronic Measurements & Instrumentation	3	1	-	3
3.	DC	Digital Communications	3	1	-	3
4.	MWE	Microwave Engineering	3	1	-	3
5.	CO	Computer Organization	3	1	-	3
6.	OE	Open Elective 1. Embedded Systems 2. E-Waste Management 3. Industrial Electronics	3	1	-	3
7.	AC&DCL	Analog & Digital Communications Lab	-	-	4	2
8.	DSPL	Digital Signal Processing Lab	-	-	4	2
9.	COE-II	Comprehensive Online Examination-II	-	-	-	-
TOTAL			18	6	8	22

L–Lecture, T–Tutorial, P -Practical

B.Tech :IV- Year, I- Semester

--	--	--	--	--

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Electronics and Communication Engineering

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	OC	Optical Communications	3	1	-	3
2.	VLSI	VLSI System Design	3	1	-	3
3.	MS	Management Science	3	1	-	3
4.	CN	Computer Networks	3	1	-	3
5.	E-I	Elective-I 1.Digital Image Processing 2.DSP Processors& Architecture 3. Biomedical Instrumentation	3	1	-	3
6.	E-II	Elective-II 1.WirelessSensorNetworks 2.ArtificialNeuralNetworks 3.Cellurer & Mobile Communication	3	1	-	3
7.	MW&OCL	Microwave &Optical Communications Lab	-	-	3	2
8.	VLSIL	VLSI Design Lab	-	-	3	2
	MP	Mini Project	-	-	-	2
		TOTAL	18	6	6	24

L–Lecture, T–Tutorial, P -Practical

IV- Year, II- Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1	SC	Satellite Communication	3	1	-	3
2	RE	Radar Engineering	3	1	-	3
3		Massive Open Online Courses-I 1.Digital Design Through Verilog 2. MEMS and Micro Systems 3. Information Theory and Coding	3	-	-	3
4		Massive Open Online Courses-II 1.Real Time Operating Systems 2.Cellular Mobile Communications 3. Digital System Design with PLDs and FPGAs	3	-	-	3
5	PW	Project Work	-	-	-	5
6	SMNR	Seminar	-	-	-	2
7	CV	Comprehensive Viva-Voce	-	-	-	3
		TOTAL	12	2	-	22

L–Lecture, T–Tutorial, P –Practical

B.Tech I Year I Sem. FUNCTIONAL ENGLISH
(Common for
CSE,ECE,MECHANICAL,EEE&CIVIL)

L	T	C
3	1	3

UNIT – I

Green Cover, Pollution Tenses, Prepositions, Prepositional Phrases, Writing Letters

UNIT – II

Solar Thermal Power, Cloud Computing Subject-Verb Agreement, Prefixes and Suffixes, Compound Nouns, Imperatives

UNIT – III

Child Labour, Food Crisis Synonyms & Antonyms, Verbs: Regular & Irregular, Homonyms, Homophones and Homographs, Direct and Indirect Speech

UNIT – IV

E-Waste, Assistive Technology Articles, Collocations, Conjunctions, Note-Making, Making Recommendations, If Conditional Hubble Telescope, A Home in the Sky Degrees of Comparisons, Voice, Question Tags

UNIT – V

The Evolution of Media, Ten Developments in Media, Advertisements Paragraph Writing, Effective Writing, Writing Reports, Expansion of Proverbs and Idioms, Commonly Confused Words

Primary Source: The Prescribed Textbook:

1. Mindscapes: English for Technologists and Engineers. Department of English, Anna University, Chennai. Published by Orient Blackswan Private Limited, 2012, Reprinted: 2013, 2014.

Web Resources:

1. <https://www.theguardian.com/commentisfree/2011/nov/27/durban-climate-change-delivery>
2. <http://andromida.hubpages.com/hub/cloud-computing-architecture>
3. <http://www.unicef.org/protection/childlabour.html>
4. <http://www.thehindu.com/health/article111240.ece>
5. http://hubblesite.org/the_telescope/nuts_and_bolts/spacecraft_systems/
6. <http://journalism.about.com/od/trends/tp/topstories2000s.htm>

B.Tech I Year I Sem

MATHEMATICS

(Common for CSE,ECE , MECHANICAL, EEE&C IVIL)

L	T	C
3	1	3

Unit-I

Exact, linear and Bernoulli equations, Orthogonal trajectories. Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax} , $\sin x$, $\cos x$, polynomials in x , $e^{ax}V(x)$, $xV(x)$. Method of variation of parameters.

Unit-II

Taylor's and Maclaurin's series-Functions of several variables-Jacobian-Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers with three variables only. Radius of curvature.

Unit-III

Multiple integral-Double and triple integrals-Change of variables-Change of order of integration.

Unit-IV

Vector Calculus: Gradient-Divergence-Curl. Vector Integration-Line integral-Area-Surface and Volume integrals. Vector integral theorems: Green's theorem-Stoke's theorem-Gauss Divergence theorem (With outproofs). Applications of Green's, Stoke's and Gauss Divergence theorems.

Unit-V

Laplace Transforms: Definition-Transform of elementary functions-Properties of Laplace Transforms-Transform of derivatives-Transform of integrals-Unit step function-multiplication by t^n -Division by t -Evaluation of integrals by Laplace Transforms-Laplace Transform of periodic functions.

Inverse Laplace Transforms-Partial fractions-Other methods of finding inverse transforms-Convolution theorem-Applications of Laplace transforms to Ordinary differential equations of first and second order.

TEXT BOOKS:

1. A Text Book of Engineering Mathematics, Vol.1, T.K.V. Iyengar, B.Krishna Gandhi and others, S.Chand and Company.
2. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers.
3. Engineering Mathematics-I, E.Rukmangadachari & E.Keshava Reddy, Pearson Publisher.

REFERENCES:

1. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India.
2. Higher Engineering Mathematics, by B.V.Ramana, Mc Graw Hill Publishers.
3. Advanced Engineering Mathematics, by Alan Jeffrey, Elsevier.

Web Resources: Khanacademy.org

Maths.psu.edu

Whitmen.edu/Mathematics

B.Tech I Year I Sem. ENGINEERING PHYSICS
(Common for CSE,ECE,&EEE)

L	T	C
3	1	3

UNIT I PHYSICAL OPTICS

Interference- Interference in thin film by reflection-Newton's rings-Diffraction-Fraunhofer diffraction due to single slit-Fraunhofer diffraction due to double slit and diffraction grating.

LASERS

Introduction- Spontaneous and stimulated emission of radiation-Einstein's coefficients-Population inversion-Ruby laser-He-Ne laser-Application of lasers.

UNIT II CRYSTALLOGRAPHY

Introduction-Space lattice- Unit cell-Lattice parameters –Bravais lattice-Crystal system-Packing fraction of SC, BCC and FCC –Directions and planes in crystals-Miller indices-Interplanar spacing in cubic crystals-X-ray diffraction–Bragg's law.

UNIT III QUANTUM MECHANICS

Matter waves-de Broglie hypothesis and properties-Heisenberg's uncertainty principle-Schrödinger's time dependent and independent wave equations-Physical significance of wave function-Particle in one dimensional infinite potential well.

UNIT IV SEMICONDUCTORS

Intrinsic and Extrinsic semiconductors-Drift and Diffusion currents and Einstein's equation-Hall effect-LED-Photodiode.

SUPERCONDUCTIVITY

Introduction-General properties-Meissner effect-Penetration depth- Type-I and Type-II superconductors-Josephson effects-Application of superconductors.

UNIT V DIELECTRIC PROPERTIES

Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector-Relation between D, E, P - Internal Fields in Solids (Lorentz field)- Clausius - Mossotti Equation.

ELECTROMAGNETIC THEORY

Scalar and Vector Fields-Gradient, Divergence of fields-Fundamentals of Electromagnetism: Gauss law for electrostatics and magnetostatics-Derivations of Maxwell's Equations (Integral & Differential form)-Equation of Electromagnetic waves.

Text Books

1. Engineering Physics- B.K. Pandey & S. Chaturvedi CENGAGE Learning Publications
2. Applied Physics – P.K.Palanisamy (SciTech Publications Pvt. Ltd.,
3. Engineering Physics- K. Vijay Kumar, S. Chand Publications
4. Engineering Physics-K. Thyagarajan, Mac Graw Hill Education Private Limited, New Delhi, 2015

References

1. Fundamentals of Physics- Halliday, Resnick and Walker, John Wiley & Sons
2. Engineering Physics- D.K Battacharya and Poonam Tandon, Oxford University Press.

Weblinks

1. <http://nptel.ac.in/courses/115101005/----EMT>
2. <http://nptel.ac.in/courses/115104096/----QM>
3. <http://nptel.ac.in/courses/115102025/----Semiconductor Devices>

B.Tech I Year I Sem PROGRAMMING FOR PROBLEM SOLVING

L	T	C
3	1	3

(Common for CSE, ECE, EEE, Civil & Mechanical)

Unit I-

Introduction to Programming

Introduction to components of a computer system (Disks,Memory,Processor, where a program is stored and executed, Operating system, Compilers etc..)

Idea of Algorithm: Steps to solve logical and Numerical problems.

Representation of Algorithm: Flowchart/pseudo code with examples

From Algorithms to Programs: Source code, variables (With Data types) variables and Memory locations, syntax and logical errors in compilation, Object and executable code.

Arithmetic Expressions and precedence, Conditional Branching and loops. Writing and Evaluation of Conditionals and Consequent branching, Iteration and Loops.

Unit II -

Arrays-Arrays (1-D,2-D), Character Arrays and Strings.

Basic Algorithms: Searching, Basic sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notation of order of complexity through example program.(No formal definition required).

Unit III-

Function: functions (including using built in libraries), parameter passing in functions, call by value, passing arrays to functions: idea of call by reference.

Recursion: Recursion,as a different way of solving problems.Example programs such as finding factorial,Fibonacci series, Ackerman function etc.Quick sort or Merge sort.

Unit IV-

Structure: Structures,defining structures and Array of structures.

Pointers: Idea of pointers, Defining pointers, use of pointers in self referential structures, notion of linked lists(No implementation).

Unit V-

Files - Introduction, Streams and File Types, Steps for File Operations, File I/O Structures, Read and Write.

Dynamic Memory Allocation, Introduction to Data Structures: Linear and Non Linear Data Structures.

TEXT BOOKS :

1. Byron Gottfried, Schaum's Outline of programming with C, McGraw- Hill.
2. E.Balaguruswamy,Programming in ANSI C,Tata McGraw-Hill.

REFERENCES :

1. Brian W.Kernighan and Dennies M Ritchie, The C Programming Language, Prentice Hall of India.

B.Tech I Year I Sem.

ENGINEERING GRAPHICS
(Common for CSE, ECE & EEE)

L	T	C
3	1	3

UNIT I

Introduction to Engineering Drawing: Principles of Engineering Graphics and their Significance- Conventions in Drawing-Lettering – BIS Conventions.

Curves used in Engineering Practice.

a) Conic Sections including the Rectangular Hyperbola- General method only b) Cycloid, Epicycloid and Hypocycloid.

UNIT II

Projection of Points: Principles of orthographic projection – Convention – First angle projections, projections of points.

Projections of Lines: lines inclined to one or both planes, Problems on projections, Finding True Lengths only.

UNIT III

Projections of Planes: Projections of regular plane surfaces- plane surfaces inclined to both planes.

UNIT IV

Projections of Solids: Projections of Regular Solids with axis inclined to one plane only.

UNIT V

Isometric and Orthographic Projections: Principles of isometric projection- Isometric Scale- Isometric Views- Conventions- Isometric Views of lines, Planes, Simple solids (cube, cylinder and cone).

Conversion of isometric Views to Orthographic Views.

TEXT BOOKS:

- 1.Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing, Johle /Tata McGraw-Hill
- 3.Engineering Drawing, Shah and Rana, 2/e Pearson education
4. Engineering Drawing, K.L.Narayana
5. Engineering Drawing, Sankar Prasad Dey

REFERENCES:

1. Engineering Drawing and Graphics, Venugopal/ New age
2. Engineering Drawing, B.V.R. Guptha, J.K. Publishesrs

B. Tech, I- Year: II- Semester

Course Structure

S.No.	Course Code	Subject	L	T	P	Credits
1.	CE	Communicative English	3	1	-	3
2.	M-II	Mathematical Methods	3	1	-	3
3.	EC	Engineering Chemistry	3	1	-	3
4.	DS	Data Structures	3	1	-	3
5.	DLD	Network Analysis and Synthesis	3	1	-	3
6.	CSL	Communication Skills Lab	-		4	2
7.	CHEML	Chemistry Lab	-		4	2
8.	DSL	Data Structures using C++ Lab	-		4	2
		TOTAL	15	5	12	21

L–Lecture, T–Tutorial, P -Practical

B.Tech I Year II Sem. COMMUNICATIVE ENGLISH
(Common for CSE,ECE, MECHANICAL,EEE & CIVIL)

L	T	C
3	1	3

UNIT – I

The Importance of History, The Mother of Modern Corporatism Pure Vowels, Just-A-Minute, Designing Posters

UNIT – II

In Search of Our Energy Solutions, Wind Energy Diphthongs, Role Play, Making Conversation/Situational Dialogues

UNIT – III

Learning from Disasters, Biotechnology: Ethical Questions Consonant Sounds, Debate, Blog Making Ten Reasons Why Travel is a Waste of Time, Atithi Devo Bhava Syllables, Word Stress Rules, Group Discussion

UNIT – IV

SWOT Analysis, Tourism in India: Role in Conflict & Peace Presentation Skills, Writing Emails, Creativity: Thinking and Writing

UNIT – V

Curriculum Vitae, Preparing for the Interviews Types of Interviews, Mock Interviews, Personality Development

Primary Source: The Prescribed Textbook:

2. *Mindscales: English for Technologists and Engineers*. Department of English, Anna University, Chennai. Published by Orient Blackswan Private Limited, 2012, Reprinted: 2013, 2014.

Web Resources:

1. <http://www.redpepper.org.uk/The-mother-of-modern-corporatism/>
2. https://energypedia.info/wiki/Wind_Energy_-_Introduction#Wind_Energy_-_Overview
3. http://www.aerospaceguide.net/spaceshuttle/challenger_disaster.html
4. <http://www.501places.com/2010/05/10-reasons-why-travel-is-waste-of-tim/>
5. www.seiofbluemountain.com/search/detail.php?id=3829
6. <http://economictimes.indiatimes.com/quickiearticlelessshow/10155264.cms>

B.Tech I Year II Sem

MATHEMATICAL METHODS
(Common for CSE,ECE , Mechanical, EEE& Civil)

L	T	C
3	1	3

UNIT -I

Matrices: Elementary row transformations – Rank – Echelon form, normal – Solution of Linear System of Homogenous and Non Homogeneous equations –Eigen values, Eigen vectors – (Excluding proofs of Properties). Cayley – Hamilton Theorem(Excluding Proof) – Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix.

UNIT-II

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

UNIT-III

Fourier series: Determination of Fourier coefficients- Fourier series of Even and odd functions- Fourier series in an arbitrary interval-Even and odd periodic continuation- Half range Fourier sine and cosine expansions. Fourier integral theorem (statement only) – Fourier sine and cosine integrals. Fourier transform- Fourier sine and cosine transforms- Properties- Inverse transforms- Finite Fourier transforms.

UNIT-IV

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions-Method of separation of variables-Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace equation under initial and boundary conditions.

UNIT-V

z-transform –inverse z-transform-Properties-Damping rule –shifting rule- Initial and final value theorems. Convolution theorem-Solution of difference equations by transforms.

TEXT BOOKS:-

1. Mathematical Methods, T.K.V. Iyengar, B.Krishna Gandhi and Others, S.Chand& Company.
2. Mathematical Methods, C.Sankaraiah, V.G.S.Book Lines.
3. Mathematical Methods, G.Shanker Rao, E.Keshava Reddy.,I.K.International Publishing House Pvt.Ltd.

REFERENCES:

1. Numerical Methods for Scientific and Engineering Communication, M.K.Jain,S.R.K. Iyengar& R.K.Jain, New Age international Publishers.
2. Mathematical Methods –Pal –Oxford.
3. Introduction to Numerical Analysis –S.S.Sastry Printice Hall of India
4. Mathematical Methods, S.K.V.S.Sri Ramachary, M. Bhujanga Rao, P.B.Bhaskar Rao & P.S.Subramanyam, BS Publications.

Web Resources:Khanacademy.org

(B.Tech. I-Year II-Sem) ENGINEERING CHEMISTRY

(Common to CSE ECE&EEE)

L	T	C
3	1	3

UNIT I : Atomic structure, crystal field theory and water technology

Atomic structure: Schrodinger wave equation (Eigen-value and Eigen-function). **Crystal field theory:** Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. **Water technology:** Source of water, impurities in water, hardness of water by using EDTA method, temporary and permanent hardness and its units.

UNIT II: Periodic Properties

Effective nuclear charge, penetration of orbitals, vibrations of s, p, d and f orbital's energies of atoms in the periodic table, electronic configuration, atomic sizes, ionization energies, electron affinity and electro negativity, polarizability, oxidation states, coordination number and geometries..

UNIT III: Corrosion

Corrosion: Theories (dry-wet, chemical and electrochemical corrosion) of corrosion and mechanism. Types of corrosions and control methods-cathode protection sacrificial anodic, impressed current method.

UNITIV: Organic reactions and synthesis of a drug molecule

Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings and synthesis of a commonly used drug molecule.

UNIT V: Stereochemistry

Structural isomers and stereo isomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis.

TEXT BOOKS

- 1.Chemistry of engineering., Prof. K.N. Jayaveera, Dr. G.V. Subba Reddy and Dr. C. Ramachandraiah. *McGraw hill higher education*. Hyderabad, **2009**.
- 2.A text book of engineering chemistry., S.S. Dara, *S. Chand & Co.*, New Delhi, **2008**.
- 3.A text book of engineering chemistry., Jain and Jain, *Dhanpat Rai Publishing Company.*, 15th edition, New Delhi,**2008**.
4. University chemistry, by B.H. Mahan
5. Chemistry: Principles and applications, by Sienko and R.A. Plane
- 6.Engineering chemistry(NPTEL Web-book), by B.L. Tembe, kamaluddin and M.S. Krishna.
- 7.Physical chemistry ,by P.W. Atkins
- 8.Organic chemistry: Structure and function by K.P.C. Vollhardt and N.E. Schore, 5th Edition. <http://bcs.whfreeman.com/vollhardtschore5e/default.asp>

REFERENCE BOOK

- 1.Engineering chemistry 3e , R.P. Mani, K.N. Mishra, B. Rama Devi and V.R. Reddy, *Cengage Learning*, India, First Impression,**2014**.

B.Tech I Year II Sem

DATA STRUCTURES
(Common for CSE & ECE)

L	T	C
3	1	3

UNIT I

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

UNIT II

Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes.

UNIT III

Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion.

UNIT IV

Dictionaries, linear list representation, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT V

Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees.

TEXT BOOKS:

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

REFERENCES:

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

**B.Tech I Year II Sem NETWORK ANALYSIS AND SYNTHESIS
(FOR ECE BRANCH ONLY)**

L	T	C
3	1	3

UNIT-I INTRODUCTION TO ELECTRICAL CIRCUITS: Circuit concept-R-L-C-parameters-voltage and current sources-independent and dependent sources-source transformation-voltage-current relationship for passive elements (for different input signals-square, ramp,saw tooth, triangular), R.M.S., Average values and form factor for different periodic wave forms, Kirchoff's laws-network reduction techniques-Series, parallel, series parallel, Star-to-delta, delta-to-star transformation.

UNIT-II NETWORK TOPOLOGY & COUPLED CIRCUITS: Graph-Tree, Basic cut-set and Tie-set matrices for planar network-loop and nodal methods of networks with dependent & independent voltage and current sources- nodal analysis, mesh analysis, super node and super mesh for D.C.Excitations-duality & dual networks,Dot convention-coefficient of coupling-analysis of coupled circuits, Concept of self and mutual inductance.

UNIT-III RESONANCE, STEADY STATE AND TRANSIENT ANALYSIS: Steady state analysis of i.e Parallel RL,RC, RLC & its power and power factor calculations, Resonance-Series, Parallel circuits, Concept of bandwidth and Q-factor, Transient Response of RL, RC Series, RLC Circuits for DC excitations, Initial Conditions,Solution using Differential Equations approach and Laplace Transform method (First and Second Order circuits).

NETWORK THEOREMS: Superposition, Thevenin's, Norton's Theorems. Maximum Power Transfer Theorem, Reciprocity Theorem, Compensation Theorem, Milliman's Theorem for DC and Sinusoidal excitations.

UNIT-IV TWO PORT NETWORKS: Two port network parameters, Different types, Conversion of one to another, Reciprocity and symmetric conditions, Interconnection of two port networks in series, parallel and cascaded configurations.

UNIT-V SYNTHESIS OF NETWORKS: Hurwitz polynomial and its test, Burnes positive realness, Driving point immittances of positive real functions, Properties, Necessary and sufficient conditions for positive real functions and its applications, Properties of driving point impedance functions, Driving point synthesis, Synthesis of LC,RL, RC networks foster forms, cauer forms of networks.

TEXT BOOKS:

1. Engineering Circuits Analysis by William Hayt and Jack E.Kemmerly, McGraw Hill, 6th Edition.
2. Network Analysis by A.Sudhakar and Shyam Mohan, TATA McGraw Hill, 4th edition.
3. Network analysis by UmeshSinha, SatyaPrakasan publishers.
4. Electric Circuits by J.Edminister and M.Nahvi-Schuam Series, TATA McGraw Hill.

REFERENCES:

1. Network Analysis by M.E.VanValkenberg, Pearson Education.
2. Electric Circuits by N.Srinivasulu, Reem Publications

B.Tech, II- Year: I- Semester

Course Structure

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	CA	Complex Analysis	3	1	-	3
2.	ET	Electrical Technology	3	1	-	3
3.	EDC	Electronic Devices And Circuits	3	1	-	3
4.	SS	Signals And Systems	3	1	-	3
5.	STLD	Switching Theory and Logic Design	3	1	-	3
6.	OOPJ	Object Oriented Programming through JAVA	3	1	-	3
7.	EDCL	Electronic Devices & Circuits Lab	-	-	4	2
8.	ETL	Electrical Engineering Lab	-	-	4	2
9.	HVPE	Human Values and Professional Ethics	2			
		TOTAL	20	6	8	22

L–Lecture, T–Tutorial, P -Practical

For II B.Tech I Sem ECE

COMPLEX ANALYSIS
(Common for ECE&EEE)

L	T	C
3	1	3

UNIT - I

FUNCTIONS OF A COMPLEX VARIABLE–Continuity–Differentiability–Analyticity–Properties–Cauchy-Riemann equations in Cartesian and polar coordinates. Harmonic and conjugate harmonic functions–Milne –Thompson method. Elementary functions: Exponential, trigonometric, hyperbolic functions and their properties-General power Z^c (c is complex), principal value.

UNIT-II

COMPLEX INTEGRATION: Line integral-evaluation along a path by indefinite integration-Cauchy's integral theorem-Cauchy's integral formula-Generalized integral formula.

UNIT-III

COMPLEX POWER SERIES: Radius of convergence-Expansion in Taylor's series, Maclaurin's series and Laurent series. Singular point-Isolated singular point-pole of order m -essential singularity.

UNIT-IV

RESIDUE- Evaluation of residue by formula and by Laurent series-Residue theorem. Evaluation of integrals of the type :a) improper real integrals b) c) d) integrals by indentation.

UNIT-V

ARGUMENT PRINCIPLE–Rouche's Theorem–determination of number of zeros of complex polynomials-Maximum Modulus principle-Fundamental theorem of Algebra, Liouville's Theorem.
Con formal mapping: Transformation by ez , $\ln z$, z^2 , z^n (n positive integer) $\sin z$, $\cos z$, $z + a/z$, Translation, rotation, inversion and bilinear transformation–fixed -points-cross ratio-properties-invariance of circles and cross ratio–determination of bilinear transformation mapping 3 given point

TEXT BOOKS:

- 1) A Text book of Engineering Mathematics, Vol – III by T.K.V. Iyengar, B. Krishna Gandhi and others, S.Chand and company.
- 2) Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
- 3) Engineering Mathematics by B.V. Ramana, Tata McGraw Hill.

REFERENCES:

- 1) Advanced Engineering Mathematics by Erwin Kreyszig - Wiley Publications.
- 2) Engineering Mathematics – III A by Dr.M.K. Venkataraman – The National Publishing co.
- 3) A text book of Engineering Mathematics by N.P.Bali, Iyengar – Lakshmi Publications (Pvt ltd)

REFERENCE SITES: 1) nptel.ac.in, 2) coursesra.org 3) enggvideolectures.com

For II B.Tech I Sem ECE ELECTRICAL TECHNOLOGY

L	T	C
3	1	3

UNIT –I

DC MACHINES: Principle of operation of DC machine, EMF Equation, Types of Generators, magnetization and load Characteristics of DC Generators.-Numerical problems DC Motor- Types of DC Motors Characteristics of DC Motors- 3point starters for dc shunt motor-losses and efficiency- Swinburne's test, load test-speed control of DC shunt motor-Numerical problems.

UNIT –II

TRANSFORMERS: Principle of operation of Transformer-constructional features- Phasor Diagram on no load and load – equivalent circuit-losses, efficiency and regulation of a transformer, OC & SC tests on transformer Numerical problems

UNIT –III

THREE PHASE INDUCTION MOTOR: Principle of operation of 3-phase Induction motor-slip ring and squirrel cage motors- slip torque characteristics-efficiency calculation-starting methods-speed control of induction motor- Numerical problems

UNIT –IV

ALTERNATORS: Constructional features- Principle of operation-types-EMF equation-distribution and coil span factors- pre determination of regulation by synchronous impedance method – OC & SC test- Numerical problems

UNIT –V

SINGLE PHASE INDUCTION MOTOR & BASIC INSTRUMENTS: Principle of operation of 1-phase Induction motor- constructional features-shaded pole motors-capacitor motor-split phase motors-equivalent circuit.

Introduction, classification of instruments, operating principles essential features of measuring instruments, Moving coil permanent magnet(PMMC) instruments, Moving iron of Ammeters and Voltmeters(All the above topics are only elementary treatment)

TEXT BOOKS:

1. Principle of Electrical Engineering by V.K.Mehta, Rohith Mehta, S.Chand publications.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand publications.
3. Electrical Technology-volume II – B L Theraja- S. Chand.

REFERENCE BOOKS:

1. Electrical Machinery- J B Guptha- katsonbooks .
2. Electrical Machines – I J Nagrath and D P Kothari- PHI Publications.

For II B.Tech I Sem ELECTRONIC DEVICES AND CIRCUITS

L	T	C
3	1	3

UNIT -I

SEMICONDUCTOR DIODE CHARACTERISTICS: PN junction Diode equation, VI characteristics of p-n diode, Static and Dynamic Resistances, Temperature dependence of VI characteristic, Diode equivalent circuits, Diode capacitances, Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Principle of operation and Characteristics of Tunnel Diode with the help of energy band diagrams, rectifiers and filters, Simple circuit of a regulator using Zener diode.

UNIT- II

BJT TRANSISTORS: Operation of BJT, Transistor as an amplifier, Junction transistor, Detailed study of currents in a transistor, Input and Output characteristics of transistor in CB, CE, and CC configurations, Relation between Alpha, Beta and Gamma. BJT specification, Transistor as an Amplifier. Principle of operation and characteristics of SCR.

UNIT-III

TRANSISTOR BIASING AND STABILISATION : DC and AC Load lines, Operating point, Importance of Biasing, Fixed bias, Collector to Base, Voltage Divider bias, Bias stability, Stabilization factors, (S , S' , S''), Compensation techniques, (Compensation against variation in V_{BE} , I_{co}) Thermal run away, Thermal stability in CE configuration.

UNIT- IV

FET TRANSISTORS: operation and characteristics, Pinch-Off voltage, Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Comparison of Transistors (BJT, FET, and MOSFET). Principle of operation and Characteristics of UJT.

UNIT-V

OSCILLATORS: Condition for Oscillations. RC and LC type Phase Shift oscillators. Hartley and Colpitts oscillators, Wein bridge oscillator, Crystal oscillators, Frequency and amplitude stability of Oscillators.

TEXT BOOKS :

1. Electronic Devices and Circuits – J. Millman, C.C. Halkias, and Satyabratha Jit Tata McGraw Hill, 2nd Ed., 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9th Edition, 2006.
3. Electronic Devices and Circuits- David A. Bell, 5th Edition, 2008, Oxford University Press.

REFERENCES :

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S. Beasley and G. Rico, Pearson Education, 6th edition, 2004.
2. Principles of Electronic Circuits – S.G. Burns and P.R. Bond, Galgotia Publications, 2nd Edn., 1998.
3. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
4. Electronic Devices and Circuits – Dr. K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.

1) <http://nptel.ac.in/courses/117103063/>

For II B.Tech I Sem

SIGNALS AND SYSTEMS

L	T	C
3	1	3

INTRODUCTION TO SIGNALS: 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

REPRESENTATION OF SIGNALS USING FOURIER SERIES AND FOURIER TRANSFORMS: 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, 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 unit step function.

UNIT-III

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, impulse response, Impulse 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 physical realization-The poly wiener criterion relationship between bandwidth and rise time.

UNIT-IV

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, Properties of convolution, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

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.

UNIT-V SAMPLING THEOREM AND Z-TRANSFORM: Representation of continuous time signals by its sample -Sampling theorem – Reconstruction of a Signal from its samples, aliasing – discrete time processing of continuous time signals, sampling of discrete time signals. Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, 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. Network Analysis - M.E. Van Valkenburg, PHI Publications, 3rd Edn., 2000.
3. Fundamentals of Signals and Systems Michel J. Robert, MGH International Edition, 2008.

REFERENCE SITES:

- 1) https://en.wikibooks.org/wiki/Signals_and_Systems

For II B.Tech I Sem SWITCHING THEORY AND LOGIC DESIGN

L	T	C
3	1	3

UNIT-I

NUMBER SYSTEMS, CODES AND BOOLEAN ALGEBRA: Philosophy of number systems – complement representation of Negative numbers, Binary arithmetic, Binary codes, Error Detecting & Error Correcting codes, Hamming codes. Fundamental postulates of Boolean algebra, Basic theorems and properties.

UNIT-II

SWITCHING FUNCTIONS AND IT'S MINIMIZATION: Switching functions, Canonical and standard forms, Algebraic simplification Digital Logic Gates, properties of XOR gates, Universal Gates, Multilevel NAND/NOR realizations. K-map method, Prime Implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime - Implicant chart, simplification rules.

UNIT-III

COMBINATIONAL LOGIC DESIGN: COMBINATIONAL LOGIC: Combinational circuits, Analysis procedure, Design procedure, Binary Adder/Subtractor, Decimal Adder, Binary multiplier, Magnitude comparator, Decoders, Encoders, Multiplexers, Parity bit generator, Code converters, Hazards and Hazards free realization.

PROGRAMABLE LOGIC DEVICES, THRESHOLD LOGIC: Basic PLD's-ROM, PROM, PLA, PAL Realization of switching function using PLD's.

UNIT-IV

SEQUENTIAL CIRCUITS: Classification of sequential circuits, Basic Flip-Flops, Excitation and Characteristic Tables. Steps in Synchronous Sequential circuit design. Design of modulo-N counters, Ring and Johnson counters, Universal shift register, Serial Binary adder, Sequence Detector. FSM-capabilities and Limitations, Mealy and Moore models, Minimization of completely specified and incompletely specified Sequential Machines.

UNIT-V

ALGORITHMIC STATE MACHINES: Salient features of the ASM chart, simple examples, System design using data path and control subsystems, Control Implementations, Examples of Weighing Machine and Binary multiplier.

TEXTBOOKS:

1. Switching & Finite Automata theory- ZviKohavi, TMH, 2nd Edition.
2. Digital Design-Morris Mano, PHI, 3rd Edition, 2006.
3. Switching Theory and Logic design-A. Anand Kumar, 2008.

REFERENCES:

1. An Engineering Approach to Digital Design-Fletcher, PHI.

2. Fundamentals of Logic Design-Charles H.Roth.5th Edition, 2004, Thomson publications.
3. Digital Logic Applications and Design-John M.Yarbrough, 2006, Thomson Publications.

REFERENCE SITES:

- 1)<http://www.springer.com/in/book/9780387285931>
- 2)<http://2ndece12.blogspot.in/p/switching-theory-and-logic-design.html>

For II B.Tech I Sem OBJECT ORIENTED PROGRAMMING THROUGH JAVA

L	T	C
3	1	3

UNIT I

JAVA BASICS - History of Java, Java buzzwords, comments, data types, variables, constants, scope and life time of variables, operators, expressions, type conversion and casting, control flow, conditional statements, break and continue, simple java program, arrays. OOP concepts, parameter passing, static fields and methods, access control, this, overloading methods and constructors, Strings, string functions.

UNIT II:

INHERITANCE –Inheritance concept, Super and Sub classes, Member access rules, types of Inheritance, super uses, final classes and methods, casting, polymorphism- dynamic binding, method overriding, abstract classes and methods, Interfaces – Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

UNIT III

PACKAGES- Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages. Files – streams, text Input/output, binary input/output, random access file operations, File management using File class, Using java.io.

UNIT IV

EXCEPTION HANDLING – benefits of exception handling, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, built in exceptions, creating own exceptions. Multithreading - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication.

UNIT V

EVENT HANDLING - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

TEXT BOOKS

1. Java; the complete reference, 7th edition, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, pearson education.

REFERENCES

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley & sons.

2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, seventh Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.

II Year: II- Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	MEFA	Managerial Economics & Financial Analysis	3	1	-	3
2.	PDC	Pulse and Digital Circuits	3	1	-	3
3.	EMTL	EM Waves And Transmission Lines	3	1	-	3
4.	ECA	Electronic Circuit Analysis	3	1	-	3
5.	ES	Environmental Science	3	1	-	3
6.	PTSP	Probability Theory & Stochastic Processes	3	1	-	3
7.	ECAL	Electronic Circuit Analysis Lab	-	-	4	2
8.	PDCL	Pulse and Digital Circuits Lab	-	-	4	2
9.	COE-I	Comprehensive Online Examination-1	-	-	-	-
TOTAL			18	6	8	22

L–Lecture, T–Tutorial, P -Practical

B.Tech II Sem MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

L	T	C
3	1	3

UNIT I:

INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

UNIT II:

ELASTICITY OF DEMAND: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting).

UNIT III:

BUSINESS & NEW ECONOMIC ENVIRONMENT: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

UNIT IV:

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

INTRODUCTION TO FINANCIAL ACCOUNTING: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

UNIT V:

FINANCIAL ANALYSIS THROUGH RATIOS: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.
5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications

REFERENCE SITES:

- 1) <https://www.smartzworld.com/notes/managerial-economics-and-financial-analysis-mefa/>

II B.Tech II Sem PULSE & DIGITAL ELECTRONICS (PDE)

L	T	C
3	1	3

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, attenuators, its applications in CRO probe, RL and RLC circuits and their response for step input.

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, Different clamping Circuits, Clamping circuit theorem.

UNIT III:

MULTI VIBRATOR CIRCUITS: Diode as a switch, Piecewise linear diode characteristics, Diode Switching times, Transistor as a switch, Designing of transistor switch, Transistor-switching times, Analysis and design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger circuit using BJT.

UNIT IV:

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.

UNIT V:

SAMPLING GATES AND SYNCHRONIZATION: Basic operating principles of sampling gates. Pulse Synchronization of relaxation devices.

Realization of Logic Gates Using Diodes & Transistors: AND, OR & NOT gates using Diodes and Transistors, DCTL, RTL, DTL, TTL and CMOS Logic Families, and comparison between the logic families.

TEXT BOOKS:

1. Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub, McGraw-Hill, 1991.
2. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002.

REFERENCES:

1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2. Wave Generation and Shaping - L. Strauss.

3. Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman.
4. Pulse and Digital Electronics – G.K.Mithal.

Weblinks:

https://www.youtube.com/watch?v=iMG1-_rCGjI
<https://www.youtube.com/watch?v=PsPlyzDibfU>

II B.Tech I Sem EM WAVES AND TRANSMISSION LINES

L	T	C
3	1	3

UNIT I

REVIEW OF COORDINATE SYSTEMS, VECTOR CALCULUS:

STATIC ELECTRIC FIELDS : 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, Continuity Equation, Poisson's and Laplace's Equations, Related Problems.

STATIC MAGNETIC FIELDS: Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Ampere's Force Law, Related Problems.

UNIT II

TIME VARYING EM FIELDS: Faraday's Law of induction, 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, Poynting Theorem, Related Problems.

UNIT III

EM WAVE PROPAGATION: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, Relations between E & H. Sinusoidal Variations. Wave Propagations in Lossless and Conducting Media. Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics. Polarization. Related Problems

UNIT IV

GUIDED WAVES: Parallel Plane Waveguides Introduction, Transverse Electric waves (TE), Transverse Magnetic waves (TM), TEM Modes – Concepts, expressions and Analysis, Cut-off Frequencies, Velocities, Wavelengths, Related Problems.

UNIT V

TRANSMISSION LINES: Types, Equivalent Electrical circuits, Transmission Line Equations, Primary & Secondary Constants, Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line, Distortion – Distortion less and minimum attenuation condition, Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR.

TEXT BOOKS:

1. Elements of Electromagnetics – 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.

3. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, TMH, 7th ed., 2006.
4. Electromagnetic Field Theory and Transmission Lines – G.S.N. Raju, Pearson Edn. Pte.Ltd., 2005.
5. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2001

REFERENCE SITES:

- 1) <http://freevideolectures.com/Course/2326/Transmission-Lines-and-EM-Waves>

L	T	C
3	1	3

II B.Tech II Sem ELECTRONIC CIRCUIT ANALYSIS

UNIT-I

BJT AND FET AMPLIFIERS: Small signal low frequency transistor amplifier circuits, h-parameter representation of a transistor, Analysis of single stage transistor amplifier (CE, CB, and CC) using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of A_i , R_i , A_v , R_o , Small signal model of JFET, Analysis of single stage FET amplifier (CS, CG, and CD) using h-parameters.

UNIT-II

MULTI STAGE AMPLIFIERS: Review of Small Signal Analysis of Transistors, Millers Theorem, Different Coupling Methods used in Amplifiers-RC, Direct, Transformer coupled Amplifiers. Analysis of Cascaded RC Coupled amplifiers. High Input Resistance Transistor Circuits. Cascode Transistor Configuration, CE-CC Amplifiers. Two Stage RC Coupled JFET amplifier (in Common Source (CS) configuration), Difference Amplifier

UNIT-III

HIGH FREQUENCY TRANSISTOR CIRCUITS: Transistor at High Frequencies, Hybrid-Pi Common Emitter Transistor Model, Determination of Hybrid-Pi Parameters, Variation of Hybrid Parameters with $|I_C|$, $|V_{CE}|$ and Temperature. The Hybrid-Pi CE Short Circuit Current Gain, CE Current Gain with Resistance Load, Gain Band width product, Design of High frequency Amplifier. Frequency Effects, Amplifier Analysis.

UNIT-IV

FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis.

LARGE SIGNAL AMPLIFIERS: Types of Power amplifiers, Class A Power Amplifier, Maximum Efficiency of Class A Amplifier, Transformer Coupled Audio Amplifier, Types of Distortions in amplifiers, Push Pull Amplifier (Class A, Class B), Complimentary Symmetry.

UNIT-V

TUNED AMPLIFIERS: Introduction, Q-Factor, Small Signal Tuned Capacitive Coupled, Tapped Single Tuned Capacitance Coupled Amplifier, Single Tuned Transformer Coupled Amplifier, Effect of Double Tuned CE Amplifier, Application of Tuned Amplifiers. Synchronous Tuning, Stagger Tuning, Stability of Tuned Amplifiers.

TEXT BOOKS :

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

2. Electronic Devices and Circuits, Theodore F. Bogart Jr., J.S. Beasley and G. Rico, Pearson Edition, 6th Edition, 2004.

REFERENCES :

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/PrenticeHall, 9th Edition, 2006.
2. Micro Electronic Circuits – Sedra A.S. and K.C. Smith, Oxford University Press, 5th ed.
3. Micro Electronic Circuits: Analysis and Design – M.H. Rashid, Thomson PWS Publ., 1999.
4. Principles of Electronic Circuits – S.G. Burns and P.R. Bond, Galgotia Publications, 2nd Edn., 1998.
5. Electronic Circuit Analysis and Design – Donald A. Neaman, McGraw Hill.
6. Electronic Circuit Analysis – K. Lal Kishore, BS Publications, 2004.

REFERENCE SITES: <https://www.smartzworld.com/notes/electronic-circuit-analysis-eca/>

II B.Tech II Sem ENVIRONMENTAL SCIENCE

L	T	C
3	1	3

UNIT-I

INTRODUCTION OF ENVIRONMENTAL STUDIES-NATURAL RESOURCES: Definition, The Global environment and its segments; Structure and composition of atmosphere, hydrosphere, lithosphere and biosphere Scope and Importance of Environmental Studies – Need for Public Awareness. Renewable and non-renewable resources –Natural resources and associated problems – Forest resources: Introduction –deforestation, case studies –Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources :Introduction–Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Introduction,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. - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

UNIT – II

ECOSYSTEMS: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem: 1. Forest ecosystem. 2. Grassland ecosystem. 3. Desert ecosystem. 4. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT – III

BIODIVERSITY AND ITS CONSERVATION: Introduction - Definition: genetic, species and ecosystem diversity. –Biogeographical 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-spots 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 – IV

ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of :1. Air pollution. 2. Water pollution 3. Soil pollution 4.Marine pollution 5. Noise pollution 6.Thermal pollution 7 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.

Social Issues And The Environment: From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, and watershed management –Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental

ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

UNIT-V

HUMAN POPULATION AND THE ENVIRONMENT: Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. -HIV/AIDS. ,Infectious diseases, -Tuberculosis, cancer, Water Borne Diseases-Malaria, Diarrhea -Women and Child Welfare. - Role of information Technology in Environment and human health. -Case Studies.

TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.
3. A Basic Course in environmental Studies by S. Deswal and A. Deswal , Dhanpat Rai & Co

REFERENCE SITES: <http://libguides.lib.msu.edu/c.php?g=95557&p=624219>

L	T	C
3	1	3

II B.Tech II Sem PROBABILITY THEORY & 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, Methods of defining Conditioning Event, Conditional Density, Properties.

UNIT III

OPERATION ON ONE RANDOM VARIABLE – EXPECTATION : 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, Transformation of a Discrete Random Variable.

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

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, and Linear Transformations of Gaussian Random Variables.

UNIT IV

RANDOM PROCESSES – TEMPORAL CHARACTERISTICS: The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationary and Statistical Independence. First-Order Stationary Processes, Second-Order and Wide-Sense Stationary, (N-Order) and Strict-Sense Stationary, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

UNIT V

RANDOM PROCESSES – SPECTRAL CHARACTERISTICS: The Power Density Spectrum and its Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum and its Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function. **Linear Systems with Random Inputs:** Fundamentals of Linear System, Random Signal Response of Linear Systems– Convolution, Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, and Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and output.

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

REFERENCE SITES:

- 1) www.springer.com/gp/book/9781468493467.

B.Tech: III- Year, I- Semester

S.No	Course Code	Subject	Periods/ Week			Credits
			L	T	P	
1.	AC	Analog Communications	3	1	-	3
2.	CS	Control Systems	3	1	-	3
3.	AWP	Antennas And Wave Propagation	3	1	-	3
4.	AICA	Analog IC Applications	3	1	-	3
5.	DICA	Digital IC Applications	3	1	-	3
6.	MPMC	Microprocessors & Microcontrollers	3	1	-	3
7.	AICA&DICA LAB	Analog & Digital IC Applications Lab	-	-	4	2
8.	MPMCL	Microprocessors and Microcontrollers lab	-	-	4	2
9.	ACSP	Advanced Communications Skills Practice	-	-	3	-
10	CMS	Community Service	-	-	-	2
		TOTAL	18	6	11	24

L–Lecture, T–Tutorial, P -Practical

III B.Tech I Sem ANALOG COMMUNICATIONS

L	T	C
3	1	3

UNIT I : INTRODUCTION TO COMMUNICATION SYSTEMS: Communication process, Elements of Communication Systems; Modulation: Need for Modulation, Forms of Modulation: AM, FM, PM, Advantages, Disadvantages and Applications.

UNIT II : AMPLITUDE MODULATION AND DEMODULATION: **AM:** Introduction, Mathematical Representation of AM, Modulation Factors, Percentage of Modulation, Power Relationships, Virtues and imitations of AM.DSB AM: Analog Message Conventions, AM Signals and Spectra, DSB signals and spectra.SSB AM: SSB Signals and Spectra, SSB generation, VSB Generation, Demodulation of AM, Square law detector.

AM Transmitters: Balanced Modulator, Square Law Modulator, and Product Modulator.

UNIT III: FREQUENCY, PHASE MODULATION AND DEMODULATION: FM: Introduction, Mathematical Representation of FM, Modulation Index, Deviation Sensitivity, Deviation Ratio, Bandwidth of FM (Carson's rule), Narrow band FM, Wide band FM, Voltage and Power for FM, Pre-emphasis and De-emphasis, Illustrative Problems. **PM:** Introduction, Narrow Band PM, Phase Modulation and Indirect FM; FM demodulators, Slope detector, Balanced slope discriminators, Phase difference discriminators, Ratio detector, PLL Detectors, Distortion and Transmission estimates.

Receivers: Super Heterodyne Receiver, Double Conversion Receiver and Independent Sideband Receiver.**FM Transmitters:** Direct FM and VCO's, Mixer, Divider, Multiplier. **Receivers:** Local Oscillator, Slope Detector, Phase Locked Loop, Introduction to IC 565 applications, FM demodulator.

UNIT IV: NOISE IN ANALOG COMMUNICATION SYSTEMS: Introduction, Noise in Baseband Systems, System Model and Parameter, SNR at the output of a Base band System. Noise in AM systems: System model and parameter, Noise in DSB and SSB Systems. Noise in Angle modulation Systems: Output SNR in Angle Modulation, Threshold effects in Angle Modulation Systems. Improvement of SNR using Pre-emphasis and De-emphasis, Comparison of Continuous Wave Modulation.

UNIT V : PULSE MODULATION TECHNIQUES: Definition, Types: PAM, PWM, PPM, Sampling, Nyquist rate, Flat top sampling, Generation and Detection of PAM, PWM, PPM.

TEXT BOOKS:

1. A.Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.

2. “Electronic Communications systems” Modulation and Transmission-Robert Schoenbeck, UBS Publications, New Delhi.

REFERENCES:

1. Simon Haykin, “Communication Systems”, Wiley-India edition, 3rd edition, 2010
2. Sham Shanmugam, “Digital and Analog Communication Systems”, Wiley-India edition, 2006.
3. B.P. Lathi, & Zhi Ding, “Modern Digital & Analog Communication Systems”, Oxford University Press, International 4th edition, 2010.
4. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2003.

REFERENCE SITES:

- 1) <http://nptel.ac.in/courses/117105143/>

III B.Tech I Sem

CONTROL SYSTEMS

L	T	C
3	1	3

UNIT I:

INTRODUCTION: Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Examples-Types of feedback control systems. Mathematical modelling of Electrical & Mechanical (Translational & rotational) systems – Differential equations, Electrical analogous (F-V, F-I) of mechanical system-Use of Laplace transforms in control systems- Transfer function: Concepts, features-Transfer functions of above systems.

UNIT II:

BLOCK DIAGRAM & SIGNAL FLOW GRAPH REPRESENTATION: Block diagram representation of electrical systems and reduction techniques-Signal flow graphs and reduction using mason’s gain formula-Transfer function of DC servomotor, AC servomotor.

UNIT-III:

TIME RESPONSE ANALYSIS: Definition & classification of time response-Standard test signals- Type & order of a system-Transient response of first order and second order systems for step input-Transient response specifications-Steady state response-Steady state errors and error constants-Effects of PD, PI & PID controllers.

FREQUENCY RESPONSE ANALYSIS: Introduction – Steady state response to sinusoidal input (frequency response) – Bode diagrams – Phase margin and gain margin – Stability analysis from bode plots –Determination of transfer function from Bode diagram

UNIT IV:

STABILITY ANALYSIS IN S-DOMAIN: The concept of stability – Routh’s stability criterion,special, special cases, advantages and limitations. Root locus technique: The root locus concept, construction of root loci-Effects of adding poles and zero’s to $G(s)$ $H(s)$ on the root loci.

UNIT V:

POLAR AND NYQUIST PLOTS: Polar plots – Nyquist plots – Stability analysis.

TEXT BOOKS:

- 1) Control systems – U.A. Bakshi&V.U.Bakshi, Technical publications, Pune.
- 2) Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, 2nd edition.

REFERENCES:

- 1) Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., edition 1998.
- 2) Automatic Control Systems by B. C. Kuo, John Wiley and Sons, 2003.
- 3) Control Systems Engg. by NISE 3rd Edition – John Wiley

REFERENCE SITES:

- 1) <http://nptel.ac.in/courses/108101037/>.
- 2) <https://www.youtube.com/playlist?list=PL42816CBDEAC1E82E>

III B.Tech I Sem ANTENNAS AND WAVE PROPAGATION

L	T	C
3	1	3

UNIT I ANTENNA FUNDAMENTALS: Introduction, Radiation Mechanism

– single wire, Two-wire, Current Distribution on a thin wire antenna of different lengths. Antenna Parameters - Radiation Patterns, Patterns in Principal Planes, Main Lobe and Side Lobes, Beam width, Beam Area, Radiation Intensity, Radiation Resistance, Beam Efficiency, Directivity, Gain and Resolution, Antenna Apertures, Aperture Efficiency, Effective Height. Near-field and Far-field regions.

UNIT II BASIC ANTENNA ELEMENTS: Retarded Potentials (Vector and Scalar Descriptions), Hertzian Dipole, Half-wave Dipole, Quarter-wave Monopole; Current Distribution, Evaluation of Field Components, Expression for Radiated Power and antenna parameters for Alternating Current-carrying Element, Half-wave Dipole and Quarter-wave Monopole; Small Loop Antenna, Comparison between Loop Antenna and Dipole, Illustrative problems.

Antenna Arrays: Introduction to Antenna Arrays, Purpose of antenna arrays; N-element Uniform Linear Arrays – Broadside Arrays (BSA), End-fire Arrays (EFA), Derivation of their characteristics, EFA with Increased Directivity, Comparison of BSA and EFA. Related Problems.

UNIT III HF, VHF ANTENNAS: Classification of antennas based on different characteristics. HF, VHF Antennas: V-antennas, Rhombic Antennas and Design Relations, Helical Antennas – Significance, Geometry, basic properties; Design considerations, Modes of Helical antennas- Axial Mode and Normal Mode. Yagi-Uda Antenna Arrays, Folded Dipoles & their characteristics, Principle of Pattern Multiplication, Binomial Arrays; Effects of Uniform and Non-Uniform Amplitude Distributions.

UNIT IV UHF AND MICRO-WAVE FREQUENCY ANTENNAS: Reflector Antennas: Flat Sheet and Corner Reflectors; Paraboloidal Reflectors – Geometry, Characteristics, Types of feeds. Cassegrain feed system. Horn Antennas – Types, Optimum Horns, Design Characteristics of Pyramidal Horns; Lens Antennas – Geometry, Features, Types- Non-metallic & Metallic lens and Zoning, Patch and slot Antennas. Applications of all antennas, Antenna Measurements - Introduction, Co-Ordinate System, Patterns to be measured, Pattern Measurement arrangement, Directivity and Gain Measurements (Comparison, Absolute and 3-Antenna Methods).

UNIT V WAVE PROPAGATION: Introduction-Frequency ranges and modes of propagations. Ground Wave Propagation – Characteristics, Parameters, Wave Tilt, Flat and Spherical Earth Considerations and Roughness Calculations. Sky Wave Propagation – Formation of Ionosphere

Layers and their Characteristics, Mechanism of Reflection and Refraction, Critical Frequency, MUF & Skip Distance –Optimum Frequency, LUHF, Virtual Height, Ionospheric Abnormalities, Ionospheric Absorption. Space wave propagation -Introduction, field strength variation with distance and height, effect of earth's curvature, M-curves and Duct propagation, scattering phenomena, fading path loss calculations.

TEXT BOOKS

1. Antennas and Wave Propagation- John D. Krauss and Ronald J. Marhefka and Ahmad S. Khan, 3rd Edition, TMH, New Delhi.
2. Antenna Theory - C.A. Balanis, John Wiley & Sons, 2nd ed., 2001.

REFERENCE

1. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.
2. Antennas and Wave Propagation - GSN Raju, Pearson Education India, 2009.
3. Antennas and Wave Propagation – K.D. Prasad, SatyaPrakashan, Tech India Publications, New Delhi, 2001.
4. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
5. Antennas and Wave Propagation by V.Soundararajan, SCITECH Publications.

REFERENCE SITES:

- 1) <http://nptel.ac.in/courses/108101092/>

III B.Tech I Sem

ANALOG IC APPLICATIONS

L	T	C
3	1	3

UNIT-I

INTRODUCTION TO OP-AMPS: Integrated circuits-types, classification, package types and temperature ranges, power supplies, OP-Amp Block diagram, Differential amplifier circuit configurations, Characteristics of OP-Amps, ideal and practical OP-Amp specifications, DC and AC characteristics, 741 OP-Amp and its features, OP-Amp parameters, input and output offset voltages and currents, slew rate, CMRR, PSRR.

UNIT-II

LINEAR AND NON LINEAR APPLICATIONS OF OP-AMPS: Inverting and non-inverting amplifier, integrator and differentiator, difference amplifier, instrumentation amplifier, AC amplifier, Voltage to Current, Current to Voltage converters, Buffers. Non-linear function generation, comparators, Multivibrators, Triangular and square wave generators, Log and antilog amplifiers, precision rectifiers, IC 723 voltage regulators.

UNIT-III

ANALOG FILTERS: Introduction, Butterworth filters-first order, second order LPF, HPF filters. Band pass, Band reject and all pass filters.

UNIT-IV

TIMERS AND 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, Introduction to IC 566, VCO applications and details.

UNIT-V

D/A AND A/D CONVERTERS: Introduction, Basic DAC techniques, weighted resistor DAC, R-2R Ladder DAC, Inverted R-2R DAC and different types of ADCs-parallel comparator type ADC, counter type ADC, successive approximation ADC and Dual slope ADC. DAC and ADC specifications

TEXT BOOKS:

1. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, 4th edition, PHI, 1987.
2. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2003.

REFERENCES:

1. Operational Amplifiers & Linear ICs by David A. Bell, 2nd edition, Oxford University Press, 2010.
2. Design with Operational Amplifiers & Analog Integrated Circuits - Sergio Franco, McGraw Hill, 1988.

REFERENCE SITES:

- 1) www.youtube.com/playlist?list=PLBlnK6fEyqRiw-GZRqfnlVIBz9dxrqHJS2
www.nesoacademy.org/electronics

III B.Tech I Sem DIGITAL IC APPLICATIONS

L	T	C
3	1	3

UNIT I

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

UNIT II

BIPOLAR LOGIC AND INTERFACING: 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

THE VHDL HARDWARE DESCRIPTION LANGUAGE: Design flow, program structure, types and constants, functions and procedures, libraries and packages. **THE VHDL DESIGN ELEMENTS:** Structural design elements, data flow design elements, behavioral design elements, and time dimension and simulation synthesis.

UNIT IV

COMBINATIONAL LOGIC DESIGN: Decoders, encoders, three state devices, multiplexers and demultiplexers, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, VHDL modes for the above ICs

SEQUENTIAL LOGIC DESIGN: Latches and flip-flops, counters, shift register, and their VHDL models.

UNIT V

DESIGN EXAMPLES (USING VHDL): Barrel shifter, comparators, floating-point encoder, dual parity encoder, designing with ROM.

TEXT BOOKS:

1. Digital Design Principles & Practices – John F. Wakerly, PHI/ Pearson Education Asia, 3rd Ed., 2005.
2. Fundamentals of Digital Logic with VHDL Design – Stephen Brown and Zvonko Vranesic, McGraw Hill, 2nd Edition., 2005.

REFERENCES:

1. Digital System Design Using VHDL – Charles H. Roth Jr., PWS Publications, 2nd edition, 2008.
2. A VHDL Primer – J. Bhasker, Pearson Education/ PHI, 3rd Edition.

REFERENCE SITES:

1) nptel.ac.in/courses/108106069/

III B.Tech I Sem MICROPROCESSORS & MICROCONTROLLERS

L	T	C
3	1	3

UNIT-I

8086 MICROPROCESSOR: Evaluation of microprocessors. Overview of 8085. Register organization of 8086, architecture, signal description of 8086, physical memory organization, general bus operations, I/O addressing capability, special processor activities, 8086-Minimum mode and maximum mode of operation, Timing diagram.

UNIT-II

8086 INSTRUCTION SET AND ASSEMBLER DIRECTIVES: Addressing modes of 8086, Instruction set of 8086, Assembler Directives and operators. 8086 Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III

PROGRAMMABLE PERIPHERAL DEVICES AND THEIR INTERFACING: Memory interfacing to 8086 (static RAM and EPROM). 8255 PPI-various modes of operation and interfacing to 8086. D/A and A/D converter interfacing, Stepper motor interfacing. Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing cascading of interrupt controller and its importance

UNIT-IV

8051 MICROCONTROLLER: Architecture of 8051 microcontroller. Pin Diagram of 8051, and external memories, counters and timers, serial communication, interrupts.

UNIT-V

8051 ASSEMBLY LANGUAGE PROGRAMMING: Instruction set of 8051, Addressing modes of 8051, Assembly Language Programming examples using 8051. Interfacing to LCD, Keyboard, ADC & DAC.

TEXT BOOKS:

1. Microprocessor Architecture, Programming and Applications with 8085 By Ramesh S Gaonkar.
2. Advanced microprocessor and peripherals-A.K. Ray and K.M. Bhurchandi, 2nd edition, TMH, 2000.
3. 8051 microcontroller and embedded systems by Mazidi and Mazidi, Pearson Education 2000.

REFERENCES:

1. Microprocessors Interfacing-Douglas V. Hall, Revised 2nd edition, 2007.
2. The 8088 and 8086 Microprocessors- Walter A. Triebel, Avtar Singh, PHI, 4th Edition, 2003.
3. 8051 Microcontroller-Internals, Instructions, Programming and Interfacing by Subrata Ghoshal,

REFERENCE SITES:

- 1) nptel.ac.in/courses/108107029/
- 2) nptel.ac.in/courses/106108100/

III Year II Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	DSP	Digital Signal Processing	3	1	-	3
2.	EMI	Electronic Measurements & Instrumentation	3	1	-	3
3.	DC	Digital Communications	3	1	-	3
4.	MWE	Microwave Engineering	3	1	-	3
5.	CO	Computer Organization	3	1	-	3
6.	OE	Open Elective 1. Embedded Systems 2. E-Waste Management 3. Industrial Electronics	3	1	-	3
7.	AC&DCL	Analog & Digital Communications Lab	-	-	4	2
8.	DSPL	Digital Signal Processing Lab	-	-	4	2
9.	COE-II	Comprehensive Online Examination-II	-	-	-	-
TOTAL			18	6	8	22

L-Lecture, T-Tutorial, P-Practical

III B.Tech II Sem DIGITAL SIGNAL PROCESSING (DSP)

L	T	C
3	1	3

UNIT-I

INTRODUCTION: Review of Discrete time signals and sequences, Frequency domain representation of Discrete time signals and systems.

DISCRETE FOURIER SERIES: Properties of discrete Fourier series, DFS representation of periodic sequences, discrete Fourier transforms: properties of DFT, linear convolution of sequences using DFT, computation of DFT. Relation between Z-Transform and DFS.

UNIT-II

FAST FOURIER TRANSFORM: Radix-2, Decimation in Time and Frequency algorithms, Comparison of DFT & FFT computations, In-place computation, an bit reversal, Finite Word lengths in FFT algorithms, Realization of Digital Filters – Direct forum I & II cascade, parallel.

UNIT-III

IIR DIGITAL FILTERS: Analog filter approximations-Butterworth and chebyshev, design of IIR digital filters from analog filters, design examples: analog-digital transformations, Illustrative Problems.

UNIT-IV

FIR DIGITAL FILTERS: Characteristics of FIR digital filters, frequency response. Design of FIR digital filters using window techniques, frequency sampling technique, comparison of IIR and FIR filters, Illustrative Problems.

UNIT-V

MULTIRATE DIGITAL SIGNAL PROCESSING FUNDAMENTALS: Basic sample rate alteration devices, Multirate Structures for sampling rate Converters, Multistage design of decimator and Interpolator, Polyphase Decomposition, Nyquist filters, Applications of DSP.

Text Books:

1. Discrete Time Signal Processing - Allan V.Oppenheim & Ronald W.Schafer – Pearson, 2nd Ed. 1989.
2. DSP A Practical Approach by Emmanuel C.Ifearchar, Barrie W.Jervis, Pearson, 2rd Edition, 2002.
- 3 DSP by S.Salivakanana, Avallavaraj, C.Gnanapriya, TMH, 2000

Reference Books:

1. DSP, Algorithms and applications – Proakis John G, Pearson, 3rd Edition, 2003.
- 2 Digital Signal Processing by P.Ramesh Babu, Scitech Publications, 3rd Edition, 2007.

REFERENCE SITES:

1)https://www.youtube.com/watch?v=6dFnpz_AEyA

L	T	C
3	1	3

III B.Tech II Sem ELECTRONIC MEASUREMENTS & INSTRUMENTATION

UNIT I: ELECTRICAL MEASUREMENTS: Electrical standards: ampere, voltage, resistance, capacitance & inductance standards-Suspension Galvanometer-Torque & deflection of the galvanometer-PMMC mechanism -DC Ammeters-DC voltmeters-Voltmeter sensitivity-Series and Shunt type ohm meters-Multimeters-Alternating current indicating instruments: electro-dynamometer, rectifier type-Thermo instruments-Electro-dynamometers in power measurements-Watt hour meter-Power factor meter.

UNIT II: BRIDGE MEASUREMENTS: Resistance Measurement: Wheat stone bridge, Kelvin bridge- AC bridges: Condition for bridge balance- Inductance measurement: Maxwell Bridge, Hay Bridge- Capacitance measurement: Schering Bridge- Frequency measurement: Wein Bridge- Problems of shielding and grounding.

UNIT III: ELECTRONIC MEASUREMENTS: FET input electronic volt-ohm-ammeters- AC voltmeters: rectifier type, true RMS type- Digital voltmeters: Ramp, Dual slope integration & SAR types – Q meter- Vector impedance meter-Vector volt meter- RF power and voltage measurement

UNIT IV: OSCILLOSCOPES: Oscilloscope block diagram- Vertical deflection system-Delay line-Horizontal deflection system-Vertical I/p and sweep generator signal synchronization- Oscilloscope probes: 1:1 probes, attenuator probes, active probes, current probes- Oscilloscope controls-Measurement of voltage, frequency, phase and pulse- Multi I/p oscilloscopes: dual beam, dual trace- Sampling oscilloscopes- Digital storage oscilloscopes.

UNIT V: SIGNAL GENERATORS AND ANALYZERS: Low-frequency signal generators-Function generators- Pulse generators- RF signal generators- Frequency synthesized signal generator- Heterodyne wave analyzer- Harmonic distortion analyzers- Spectrum analyzer (Basics SKUCET, S.K University Anantapuramu

only)- Time & frequency standards – Frequency measurement - time base - Period measurement - Measurement errors.

TEXT BOOKS:

1. Modern Electronic Instrumentation and Measurement Techniques- Albert D. Helfrick, William D. Cooper- PHI-2002
2. Electronic Instrumentation and Measurements- David A. Bell-PHI-2nd edition-2003

REFERENCES:

1. A course in Electrical and Electronic Measurements and Instrumentation- A.K. Sawhney-Dhanapati Rai&CO- 7th edition-2005
2. Electronic Instrumentation- H Kalsi- TMH-3rd edition
3. Electronic Measurements and Instrumentation- Oliver and Cage- TMH

REFERENCE SITES:

- 1) nptel.ac.in/courses/108106070/

III B.Tech II Sem DIGITAL COMMUNICATIONS

L	T	C
3	1	3

UNIT I: DIGITIZATION TECHNIQUES FOR ANALOG MESSAGES-I: Introduction - Importance of Digitization Techniques, Elements of Pulse Code Modulation (PCM) - Generation and Reconstruction, Quantization and coding, Quantization error, PCM with Noise, Companding in PCM

DIGITIZATION TECHNIQUES FOR ANALOG MESSAGES-II: Delta modulation, Adaptive Delta Modulation, Differential PCM systems (DPCM)

UNIT II: BASE BAND DIGITAL TRANSMISSION: Digital Signals and Systems – Digital PAM Signals, Transmission Limitations, Power Spectra of Digital PAM, Noise and Errors – Binary Error Probabilities, Matched Filtering, Optimum filtering.

UNIT III: DIGITAL MODULATION TECHNIQUES: Introduction, ASK, FSK, PSK, DPSK, QPSK, M-ary PSK Systems calculation of error probability of ASK, BPSK, BFSK, QPSK, Coherent AND Non-Coherent ASK (OOK (on-off keying)

Band Pass Digital Transmission: Introduction, Signal Space, Coherent Binary Systems – Optimum Binary Detection.

UNIT IV: INFORMATION THEORY: Introduction, Information Measure and Encoding, Entropy and Information Rate, Coding for a Discrete Memory Less Channel, Binary Symmetric Channel, Discrete Channel Capacity, Coding for the Binary Symmetric Channels.

UNIT V: CHANNEL CODING: Error Detection & Correction of Linear Block Codes Hamming Codes, Forward Error Correction (FEC) Systems, Automatic Retransmission Query (ARQ)

Systems, Matrix Representation of Block Codes, Convolutional Codes, Syndrome calculation, M-ary modulation techniques.

TEXT BOOKS:

1. A. Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.
2. Sam Shanmugam, "Digital and Analog Communication Systems", John Wiley, 2005

REFERENCES:

1. Digital communications - Simon Haykin, John Wiley, 2005
2. Herbert Taub & Donald L Schilling, "Principles of Communication Systems", Tata McGraw-Hill, 3rd Edition, 2009.
3. Digital Communications – John Proakis, TMH, 1983. Communication Systems Analog & Digital – Singh & Sapre, TMH, 2004.

REFERENCE SITES:

- 1) www.nptelvideos.in/2012/12/digital-communication.html
- 2) freevideolectures.com › Signals Systems › IIT Bombay

III B.Tech I Sem MICROWAVE ENGINEERING

L	T	C
3	1	3

UNIT – I

GUIDED WAVES: Microwave frequencies and Uses, Waves between parallel conducting planes, Waveguides: TE & TM waves in rectangular and circular wave guides, TE, TM, TEM waves characteristics, velocity of propagation, group and phase velocity, Wave impedance, Attenuation in Parallel plate guides, Attenuation and Q of wave guides, wave guide resonators, power handling capability, transmission line analogy.

UNIT – II

PASSIVE MICROWAVE DEVICES: Terminations, attenuators, Phase changes, Introduction to scattering parameters, Unitary property, derivation of s-matrix for directional couples, E-Plane, H-Plane, E-H Plane (magic Tee), Hybrid ring, microwave propagation in ferrites, faraday rotation, circulators and Isolators, matched termination.

UNIT – III

MICROWAVE TUBES : Velocity modulation, operation and performance of two cavity klystron, reflex klystron oscillator, TWT amplifier, magnetron, mode separation and applications. Introduction to PIN diode, GUNN diode, IMPATT diode, TRAPATT diode.

UNIT - IV

M-TYPE TUBES: Introduction, Cross-field effects, Magnetrons – Different Types, 8-Cavity Cylindrical Travelling Wave Magnetron – Hull Cut-off and Hartree Conditions, Modes of Resonance and PI-Mode of Operation, Separation of PI-Mode, o/p characteristics.

UNIT – V

MICROWAVE MEASUREMENTS: Bolometric and Thermocouple methods of measurement of power, frequency attenuation, VSWR, impedance measurements and measurement of scattering parameters for 2,3 and 4 port devices. Principle of Microwave communication, Link design, LOS, Microwave Repeaters

TEXT BOOKS

1. Microwave Devices and Circuits – Samuel Y.Liao, Pearson, 3rd Edition, 1990
2. Microwave & Radar Engineering's –M.Kulkarni
3. EM fields, waves and Radiating Systems – EC Jordan and Balamain, Pearson

REFERENCE BOOKS

1. Microwave Engineering and Applications –O.P.Goundhi–Progamon PR
2. Foundations for Microwave Engineering's –R.E.Collies, McGraw Hill.

REFERENCE SITES: nptel.ac.in/courses/117105130/

III B.Tech II Sem COMPUTER ORGANIZATION

L	T	C
3	1	3

UNIT I

REGISTER TRANSFER AND MICRO-OPERATIONS: Register transfer, Bus and Memory transfers, Arithmetic, Logic and Shift micro-operations, Arithmetic logic shift unit.

UNIT II

BASIC COMPUTER ORGANIZATION AND DESIGN – Instruction codes, Computer registers, computer instructions, timing and control, Instruction cycle, Memory reference instructions, Input/output and Interrupt.

Micro-programmed control: control memory, address sequencing, micro-program example, design of control unit, micro-program sequencer.

UNIT III

CENTRAL PROCESSING UNIT : General register organization, stack organization, Instruction formats, Addressing modes, data transfer and manipulation, program control.

Computer Arithmetic : Algorithms for fixed point and signed 2's complement binary arithmetic operations, floating point arithmetic operations.

UNIT IV

INPUT/OUTPUT ORGANIZATION : Peripheral devices, input/output interface, asynchronous Data transfer, modes of transfer, priority interrupt, DMA.

MEMORY ORGANIZATION: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory.

UNIT V

PIPELINE AND VECTOR PROCESSING: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC pipeline, vector processing and Array Processing, Multiprocessing.

TEXT BOOKS:

1. Computer System Architecture – M. Morris Mano – 3rd Edition., Pearson, 1993.

Reference Books:

1. Computer Architecture and Organization – John P. Hayes – McGraw Hill
2. Computer Organization – Hemachar – 5th Edition – TMH, 2002

REFERENCE SITES:

1) <http://nptel.ac.in/courses/106106166/3>

III B.Tech II Sem

EMBEDDED SYSTEMS

L	T	C
3	1	3

UNIT-I

INTRODUCTION: Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

UNIT-II

GENERAL PURPOSE PROCESSORS : Basic architecture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – MicroControllers and Digital Signal Processors.

UNIT-III

STATE MACHINE AND CONCURRENT PROCESS MODELS: Introduction, models Vs. languages, Finite state machines with data path model (FSMD), using state machines, program state Machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT-IV

INTRODUCTION TO REAL – TIME OPERATING SYSTEMS : Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT-V

BASIC DESIGN USING A REAL-TIME OPERATING SYSTEM : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software

TEXT BOOKS

1. Embedded System Design – A Unified Hardware / Software Introduction – Frank Vahid, Tony
2. Computers as Components-principles of Embedded computer system design, Wayne Wolf, Elsevier.
3. Microcontrollers, Raj kamal, Pearson Education.
4. An Embedded Software Primer, David E. Simon, Pearson Education

REFERENCE SITES:

1) nptel.ac.in/courses/108102045/

2) www.youtube.com/playlist?list=PL84637AA7125111CB

B.Tech II Sem E-WASTE MANAGEMENT

L	T	C
3	1	3

Unit –I

Overview of the course: Electronic Waste Management in India Overview E-Waste Recyclers in India Digital India Initiative Corporate Management Plans Electronic Waste Management Global Issues including Exports to Poor Countries

Unit –II

Environmental and Public Health Issues of Electronic Waste Management :Exposure pathway of pollutants emitted from Recycling of E-Waste & Quantification of Pollutants in Dust, Air and Water & Risk Assessment (According to USEPA method) of Recycling of E-Waste Recovery of Valuable Rare-Earth metals from E-Waste

Unit –III

Global Scenario: E-waste Quantum and Regulations Global Scenario, Policies and Regulations

Unit-IV

E-Waste Management Rules of India (2011 and 2016 Rules): E-waste Regulations from around the World (European, North America etc.) WEEE rules, EPR concepts, Compare and Contrast with Indian E-waste rules

Unit-V

E-waste recycling in India: Waste Recycling Practices in India

E-waste Management: Case Studies and Unique Initiatives from around the World Concept of Life Cycle Analysis and Sustainable Engineering especially from an Electrical and Electronics industry Perspectives Socio-Economic Life Cycle Analysis (SLCA) of E-Waste Management in Developing countries

Text Books

Johri R., “E-waste: implications, regulations, and management in India and current global best practices”, TERI Press, New Delhi

B.Tech III Year II Sem INDUSTRIAL ELECTRONICS

L	T	C
3	1	3

UNIT-I. Semiconductor Power Devices: - Characteristics of power diodes, power transistors, power MOSFET, IGBT, SCRs, TRIACs, DIAC

UNIT-II Turn ON and Turn OFF Circuits: - Turn ON Methods- study of single phase firing circuits using UJT, PUT, Turn OFF Methods- Forced commutation circuits- Parallel Capacitance, resonant turn off, external pulse commutation, auxiliary thyristors and load commutation. (Class A to F)

UNIT-III. Applications of Thyristors: - Static circuit breakers, over voltage protectors, zero voltage switch, integral cycle triggering, time delay method, soft start method.

UNIT-IV Controlled Rectifier Circuits:

- a) Single Phase: - Half wave, full wave, half controlled and full controlled converters with R & RL Load, effect of Freewheeling Diode. Calculations of performance parameters expected.
- b) Three Phase: - Half wave, full wave, fully controlled converters with Resistive Load only.

UNIT-V. SCR Choppers: - Introduction to DC-to-DC converters, Basic chopper circuits, Voltage control methods- Jones chopper, Morgan's chopper, Introduction to multiphase choppers. Step up chopper.

Text Books: -

- 1. P.C.Sen: Power electronics ; TMH
- 2. Chute and Chute: Electronics in industry; MGH
- 3. General Electric: SCR manual, PH
- 4. Ned Mohan: Power electronics; John Willey Pub

B.Tech :IV- Year, I- Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1.	OC	Optical Communications	3	1	-	3
2.	VLSI	VLSI System Design	3	1	-	3
3.	MS	Management Science	3	1	-	3
4.	CN	Computer Networks	3	1	-	3
5.	E-I	Elective-I 1.Digital Image Processing 2.DSP Processors& Architecture 3. Biomedical Instrumentation	3	1	-	3
6.	E-II	Elective-II 1.WirelessSensorNetworks 2.ArtificialNeuralNetworks 3.Celluler & Mobile Communication	3	1	-	3
7.	MW&OCL	Microwave &Optical Communications Lab	-	-	3	2
8.	VLSIL	VLSI Design Lab	-	-	3	2
	MP	Mini Project	-	-	-	2
		TOTAL	18	6	6	24

L–Lecture, T–Tutorial, P -Practical

UNIT I:

OVERVIEW OF OPTICAL FIBER COMMUNICATION - Historical development, The general system, advantages of optical fiber communications. Optical fiber wave guides- Introduction, Ray theory transmission, Total Internal Reflection, Acceptance angle, Numerical Aperture, Skew rays, Modes, Vnumber, Mode coupling.

UNIT II:

CYLINDRICAL FIBERS- Step Index fibers, Graded Index fibers. Single mode fibers- Cut off wavelength, Mode Field Diameter, Effective Refractive Index.

Fiber materials —Glass, Halide, Active glass, Chalcogenide glass, Plastic optical fibers. Signal distortion in optical fibers- Attenuation, Absorption, Scattering and Bending losses, Core and Cladding losses. Material dispersion, Wave-guide dispersion, Polarization mode dispersion, Intermodal dispersion. Pulse broadening

UNIT III:

OPTICAL SOURCES AND DETECTORS: Optical sources- LEDs, Structures, Materials, Quantum efficiency, Power, Modulation, Power bandwidth product. Injection Laser Diodes- Modes, Threshold conditions, External quantum efficiency, Laser diode rate equations, Resonant frequencies. Reliability of LED&ILD. Optical detectors- Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparison of Photo detectors

UNIT IV:

OPTICAL FIBER CONNECTORS- Connector types, Single mode fiber connectors, Connector return loss. Fiber Splicing- Splicing techniques, Splicing single mode fibers. Fiber alignment and joint loss- Multimode fiber joints, single mode fiber joints.

UNIT V:

OPTICAL SYSTEM DESIGN — Considerations, Component choice, Multiplexing. Point-to-point links, System considerations, Link power budget with examples. Overall fiber dispersion in Multi mode and Single mode fibers, Rise time budget with examples. WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion

TEXT BOOKS:

1. Optical Fiber Communications –Gerd Keiser, McGraw-Hill International edition, 3rd Edition, 2000.
2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002.

REFERENCES :

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

REFERENCE SITES:

- 1) nptel.ac.in/courses/117101002/

UNIT I

INTRODUCTION AND BASIC ELECTRICAL PROPERTIES : Introduction to IC Technology – MOS, PMOS, NMOS, CMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Basic Electrical Properties of MOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT II

VLSI CIRCUIT DESIGN PROCESSES: MOS Layers, Stick Diagrams, Design Rules and Layout: Lambda based CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates.

UNIT III

BASIC CIRCUIT CONCEPTS: Sheet Resistance RS and its concept to MOS, Area Capacitances of layers, standard unit of capacitance C_g , area capacitance calculations, The Delay unit, Inverter delays, estimation of MOS inverter delay, Wiring Capacitances, Choice of layers.

UNIT IV

DESIGNING ARITHMETIC BUILDING BLOCKS: Introduction; The Adders: Definition, The Full adder Circuit design consideration, The Binary adder: Logic design consideration; The Multiplier: Definition, Partial product generation, Partial product accumulation, Final addition, Multiplier summary. Introduction to FPGAs, CPLDs architectures and Standard Cells.

UNIT V

INTRODUCTION TO LOW POWER VLSI: Introduction, over view of power consumption, low power design through voltage scaling, estimation and optimization of switching activity.

TEXTBOOKS:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, PHI, 2005 Edition.
2. CMOS digital integrated circuits analysis and design by Sung-Mo Kang and Yusuf Leblebici, Tata McGraw Hill, 3rd edition.

REFERENCES:

1. Introduction to VLSI Circuits and Systems - John .P. Uyemura, John Wiley, 2003.
2. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
3. VLSI Technology – S.M. SZE, 2nd Edition, TMH, 2003.
4. Principles of CMOS VLSI Design - Weste and Eshraghian, Pearson Education, 1999.
5. Digital Integrated Circuits – A design perspective, John M. Rabaey, AnanthaChandrakasan, Borivoje Nikolic Pearson Education, 2nd Edition

REFERENCE SITES: www.nptelvideos.in/2012/12/digital-vlsi-system-design.html

UNIT-I: INTRODUCTION TO MANAGEMENT: Concepts of Management – Nature, Importance and Functions of Management, Taylor’s Scientific Management Theory, Fayol’s Principles of Management, Mayo’s Hawthorne Experiment, Maslow’s Theory of Human Needs, Douglas McGregor’s Theory X and Theory Y, Herzberg’s Two-Factor Theory of Motivation

UNIT-II: BASIC ISSUES IN ORGANIZATION: Designing Organic Structures of Organization (Line organization, Line and staff organization, Functional organization, Committee organization, Matrix organization, Virtual organization, Cellular organization, Team structure, Boundary less organization and Departmentation, Leadership Styles, Social responsibilities of Management

UNIT-III: OPERATIONS MANAGEMENT: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle., Channels of distribution.

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

UNIT-V: PROJECT MANAGEMENT (PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems)

WOMEN ENTREPRENEURSHIP: Scope of Entrepreneurship among women- Promotional efforts supporting Women Entrepreneurs in India – Opportunities for women entrepreneurs – Challenges/Problems of Women Entrepreneurs – Successful cases of Women Entrepreneurs.

TEXT BOOK:

1. Aryasri: Management Science, TMH, New Delhi.

REFERENCE BOOKS:

1. Kotler Philip & Keller Kevin Lane: Marketing Management 12/e, PHI, 2007.

2. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2007.

3. Thomas N.Duening & John M.Ivancevich Management—Principles and Guidelines, Biztantra, 2007.

B.Tech IV Year II Sem COMPUTER NETWORKS

L	T	C
3	1	3

UNIT I

Introduction to Computer networks, OSI and TCP/IP models, Examples of Networks: Novell

Networks, Arpanet. Network Topologies: WAN, LAN, MAN. Physical Layer: Transmission media: copper, twisted pair, fiberoptic. Switching and encoding, Introduction to ISDN and ATM.

UNIT II

DATA LINK LAYER: Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Data link layer in HDLC, Internet, and ATM.

MEDIUM ACCESS CONTROL SUB LAYER: The Channel allocation Problem, Multiple Access protocols: ALOHA, Carrier sense multiple accesses; MAC addresses, IEEE 802.X Standard Ethernet, wireless LANs. Bridges.

UNIT III

NETWORK LAYER-I: Virtual circuit and Datagram subnets; Routing algorithms: shortest path routing, Flooding, Broadcast, Multicast, Dynamic routing: Distance vector routing, Hierarchical routing.

UNIT IV

NETWORK LAYER-II: Congestion, General Principles of Congestion Control, Congestion Control prevention policies, Congestion Control Algorithms. Network layer in the internet: IP addresses, IPv4, IPv6 protocol, interior and exterior routing algorithms. Network layer in the ATM Networks.

UNIT V

TRANSPORT LAYER: Transport Services, Connection management, TCP and UDP protocols; ATM AALLayer Protocol. The Application Layer: Introduction to Network security, Introduction to DNS, Electronic mail, World Wide Web.

TEXT BOOKS:

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

REFERENCES:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education.
 2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson
- B.Tech III Year II Sem INDUSTRIAL ELECTRONICS (CBCC)

IV B.Tech I Sem DIGITAL IMAGE PROCESSING (DIP)

L	T	C
3	1	3

UNIT I

DIGITAL IMAGE FUNDAMENTALS: Introduction, Image sensing & acquisition, Concept of gray levels. Gray level to binary image conversion. Sampling and quantization. Relationship between pixels. Imaging Geometry.

UNIT II

IMAGE TRANSFORMS: 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform

UNIT III

IMAGE ENHANCEMENT: Enhancement in Spatial Domain: Point processing. Histogram processing. Spatial filtering. Enhancement in frequency domain: Image smoothing, Image sharpening, Basics of color image processing.

UNIT IV

IMAGE RESTORATION: Degradation model, Algebraic approach to restoration, Inverse filtering, Least mean square filters, Constrained Least Squares Restoration, Interactive Restoration

UNIT V

IMAGE SEGMENTATION: Introduction, Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.
Image Compression: Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression

TEXT BOOK :

1. Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education, 2nd Edition, 2002.

REFERENCES :

1. Fundamentals of Digital Image processing – A.K.Jain , PHI.
2. Digital Image processing using MATLAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
3. Digital Image Processing – William K. Pratt, John Wiley, 3rd Edition, 2004.
4. Fundamentals of Electronic Image Processing – Weeks Jr., SPIC/IEEE Series, PHI.
5. Digital image processing by S.Jayaraman, S.Esakkirajan&T.Veera Kumar, Tata McGraw Hill,

2010

REFERENCE SITES: nptel.ac.in/courses/117104127/

B.Tech IV Year I Sem DSP PROCESSORS & ARCHITECTURE

L	T	C
3	1	3

UNIT I: ARCHITECTURE OF DSP PROCESSOR (TMS320C5X): Introduction, Bus structure, Central Arithmetic Logic Unit (CALU), Auxiliary Register ALU (ARAU), Index Register (INDX), Auxiliary Register Compare Register (ARCR), Block Move Address Register (BMAR), Block Repeat Registers (RPTC, BRCCR, PASR, PAER), Parallel Logic Unit (PLU), Memory-Mapped Registers, Program Controller, Some flag in the status registers

UNIT II: COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATIONS: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT III: ARCHITECTURES FOR PROGRAMMABLE DSP DEVICES: Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT IV: PROGRAMMABLE DIGITAL SIGNAL PROCESSORS: Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX processors, Pipeline Operation of TMS320C54XX Processors.

UNIT V: IMPLEMENTATIONS OF BASIC DSP ALGORITHMS: The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, IMPLEMENTATION OF FFT ALGORITHMS: An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

TEXT BOOKS:

1. Digital Signal Processing – Avtar Singh and S. Srinivasan, Thomson Publications, 2004.
2. Digital Signal Processors, Architecture, Programming and Applications – B. Venkata Ramani and M. Bhaskar, TMH, 2004.

REFERENCES:

1. Digital Signal Processing – Jonathan Stein, John Wiley, 2005.
2. DSP Processor Fundamentals, Architectures & Features – Lapsley et al. S. Chand & Co, 2000

B.Tech IV Year I Sem BIOMEDICAL INSTRUMENTATION

L	T	C
3	1	3

Introduction to Biomedical Instrumentation: Bioelectric-electrodes and physiological transducers: The age of biomedical engineering, development of biomedical instrumentation, biometrics, introduction to the man instrument system, components of the man instrument system, Physiological system of the body. Recording electrodes, electrodes of ECG, microelectrodes pressure, blood flow, temperature transducers, pulse and respiration sensors.

Unit -II

Recording And Monitoring Instruments: Electrocardiograph, phonocardiograph, electroencephalograph, electromyograph. Oscilloscope for biomedical measurement cardioscope, multichannel displays non-fade display systems. Blood pressure, temperature, respiration rate measurements. Cardiotocograph, methods of monitoring fetal heart rate, fetal heart rate measurement. Interfacing computer with Medical instrumentation and other equipment, computer aided ECG analysis, computerized catheterisation laboratory, computerized patient monitoring system.

Unit -III

Patient Safety, Measurement And Analysis Techniques : Physiological effects of electrical current, shock hazards from electrical equipment, leakage currents, method of accident prevention. Ultrasonic blood flowmeters, Laser Doppler flow-meters, Coulter counter, automatic recognition and differential counting of cells. Function of the kidneys, artificial kidney.

Unit -IV

Biotelemetry And Modern Imaging Systems: Introduction to biotelemetry, physiological parameters adaptable to biotelemetry, the components of biotelemetry systems, implantable units, applications of telemetry in patient care. X-ray machine, X-ray computer topography. Physics of ultrasonic waves, medical ultrasound, A-scan, echocardiograph (M-Mode), B-scan, real-time ultrasonic imaging system, display devices for ultrasonic imaging, biological effects of ultrasound.

Unit-V

Therapeutic Equipment: Cardiac pacemakers: external, implantable, programmable pacemakers, performance aspects of implantable pacemakers, power sources for implantable pacemakers, leads and electrodes.

Text Books:

1. Biomedical Instrumentation and Measurements – Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer - PHI (1991).
2. Hand book of Biomedical Instrumentation – RS Khandpur - TMH (1991).

Reference Books:

1. Transducers of Biomedical Instruments: Principles and applications – Cobbold, R.S.C. John Wiley
2. Introduction to Biomedical Instrumentation – S.K. Guha

L	T	C
3	1	3

B.Tech IV Year I Sem WIRELESS SENSOR NETWORK S

UNIT I

OVERVIEW OF WIRELESS SENSOR NETWORKS :

Challenges for Wireless Sensor Networks, Enabling Technologies For Wireless Sensor Networks.

UNIT II

ARCHITECTURES

Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes , Operating Systems and Execution Environments, Network Architecture - Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT III NETWORKING SENSORS-I

Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor

Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC ,

UNIT IV NETWORKING SENSORS-II

The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing.

UNIT V INFRASTRUCTURE ESTABLISHMENT

Topology Control , Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

TEXT BOOKS

1. Holger Karl & Andreas Willig, " Protocols And Architectures for Wireless Sensor Networks" , John Wiley, 2005.
2. Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.

REFERENCES

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "Wireless Sensor Networks- Technology, Protocols, And Applications", John Wiley, 2007.
2. Anna Hac, "Wireless Sensor Network Designs", John Wiley, 2003

L	T	C
3	1	3

B.Tech IV Year I Sem ARTIFICIAL NEURAL NETWORKS

Unit-I

Biological Neural Network : Organisation of human brain, Neuron functions-cell body, Dendrites, Axon, Cell membrane, computers and human brains.

Artificial Neural Networks : Characteristics, single layer and multi-layer Artificial Neural Networks, Training: objective, supervised and unsupervised training, overview. **Perceptrons**: perceptron representation, learning, training algorithm, advanced algorithms and applications.

Unit - II

Neural Dynamic: Counters propagation Networks: Introduction, Network structure, Normal operation, training the Kohonen and Grossberg layers, full counter propagation network, applications.

Statistical Methods : Training, applications, applications to non-linear optimisation problems, Back propagation and Cauchy training.

Unit - III

Hopfield Networks: Recurrent network configurations, applications. **Bi-directional Associative Memories**: BAM structure, retrieving a stored association, encoding the associations, Memory capability, continuous, adaptive and competitive BAM.

Adaptive Resonance Theory: ART architecture and implementation training example, characteristics.

Unit - IV

Fuzzy sets and membership, classical sets, fuzzy sets, fuzzy set operations, properties of fuzzy sets, lambda cuts for fuzzy sets, fuzzy logic

Unit-V

Fuzzy Relations: cardinality, operations, properties, fuzzy Cartesian product and composition, fuzzy tolerance and equivalence relations

Fuzzy measures: Belief and plausibility, evidence theory, probability measures, possibility and necessity measures

Text Books:

1. Neural Computing, theory and practice - Phillip D. Wasserman – Van Nostrand Reinhold
2. Fuzzy Logic with Engg. Applications – Timothy Ross – TMH, (Unit IV & V).

Reference Books:

1. Fuzzy Set theory and its applications - H.J.Zimmerman -Allied Publishers
- 2 Fundamentals of Neural Networks, Architectures, Algorithms and Applications - LaureneFausett - Pearson, 1994
3. Fuzzy Sets, Uncertainty and Information - George I Klir and Tina A. Folger –PHI

L	T	C
3	1	3

IV B.Tech I Sem CELLULAR AND MOBILE COMMUNICATION

UNIT I

INTRODUCTION TO CELLULAR MOBILE SYSTEMS: Limitations of conventional mobile telephone systems ,A basic cellular system, Performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Elements of mobile radio system design, General description of the problem, concept of frequency channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a omni directional Antenna system, Cell splitting,

UNIT II

INTERFERENCE: Introduction to Co-Channel Interference, real time Co-Channel interference, Co-Channel measurement, design of Antenna system, Antenna parameters and their effects, Non co channel interference.

Cell site and mobile antennas: Omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas, high gain antennas.

UNIT III

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

UNIT IV

FREQUENCY MANAGEMENT, CHANNEL ASSIGNMENT AND HANDOFF: Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells. Handoff :types of handoff, handoff initiation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff

UNIT V

INTRODUCTION TO CELLULAR SYSTEMS: Advantages of digital systems, Introduction to digital technology, ARQ techniques, practical multiple access schemes.

DIGITAL CELLULAR SYSTEMS: Global system for mobile(GSM), GSM architecture, GSM Air specifications , GSM channels.

TEXTBOOKS :

1. Mobile Cellular Telecommunications – W.C.Y. Lee, Tata McGraw Hill, 2nd Edn., 2006.
2. Wireless Communications - Theodore. S. Rappoport, Pearson education, 2nd Edn., 2002.

REFERENCES :

1. Wireless and Mobile Communications – Lee McGraw Hills, 3rd Edition, 2006.
2. Wireless Communication and Networking – Jon W. Mark and Weihua Zhqung, PHI, 2005.

REFERENCE SITES:

1) nptel.ac.in/courses/117104127

IV- Year, II- Semester

S.No.	Course Code	Subject	Periods/Week			Credits
			L	T	P	
1	SC	Satellite Communication	3	1	-	3
2	RE	Radar Engineering	3	1	-	3
3		Massive Open Online Courses-I 1.Digital Design Through Verilog 2. MEMS and Micro Systems 3. Information Theory and Coding	3	-	-	3
4		Massive Open Online Courses-II 1.Real Time Operating Systems 2.Cellular Mobile Communications 3. Digital System Design with PLDs and FPGAs	3	-	-	3
5	PW	Project Work	-	-	-	5
6	SMNR	Seminar	-	-	-	2
7	CV	Comprehensive Viva-Voce	-	-	-	3
		TOTAL	12	2	-	22

L–Lecture, T–Tutorial, P –Practical

L	T	C
3	1	3

B.Tech IV Year II Sem SATELLITE COMMUNICATION

UNIT I

INTRODUCTION: Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications, Modulation Techniques used (Elementary treatment only)

ORBITAL MECHANICS AND LAUNCHERS: Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.

UNIT II

SATELLITE SUBSYSTEMS: Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antennas.

UNIT III

SATELLITE LINK DESIGN: Basic transmission theory, system noise temperature and G/T ratio,

Design of
down link, up link design, Design of satellite links for specified C/N.

UNIT IV

MULTIPLE ACCESS: Frequency division multiple access (FDMA): Intermodulation, Calculation of C/N with intermodulation. Time division Multiple Access (TDMA): Frame structure. Satellite Switched TDMA, Onboard processing, Demand Access Multiple Access (DAMA), Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

UNIT V

EARTH STATION TECHNOLOGY: Introduction, Transmitters, Receivers, Antennas, Tracking systems, Terrestrial interface.

LOW EARTH ORBIT AND NON-GEOSTATIONARY SATELLITE SYSTEMS: Orbit considerations, coverage and frequency considerations.

TEXT BOOKS:

1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE Wiley Publications, 2nd Edition, 2006.
2. Satellite Communications – Dennis Roddy, McGraw Hill, 3rd Edition, 2001.

REFERENCES:

1. Satellite Communications: Design Principles – M. Richharia, BS Publications, 2nd Edition, 2003.
2. Satellite Communication – Dr.D.CAgarwal, Khanna Publications, 5th Ed.

IV B.Tech II Sem RADAR ENGINEERING

L	T	C
3	1	3

UNIT I

INTRODUCTION TO RADAR: Basic Radar, The Simple Form of the Radar Equation, Radar block Diagram, Radar Frequencies, Applications of Radar. **THE RADAR EQUATION:** Introduction, detection of Signals in Noise, Receiver Noise and the Signal-to-Noise Ratio, Probability Density Functions, Probabilities of detection and False Alarm, Integration of radar Pulses, Radar Cross-section of Targets, Radar Cross-section Fluctuations, Transmitter Power, Pulse Repetition Frequency, Antenna Parameters, System Losses.

UNIT II

CW AND FREQUENCY-MODULATED RADAR: The Doppler Effect, CW Radar, Frequency-Modulated CW Radar, Air-Borne Doppler Navigation, Multiple –Frequency CW Radar.

MTI AND PULSE DOPPLER RADAR: Introduction to Doppler and MTI Radar, Delay-line Cancellers, Staggered Pulse-Repetition Frequencies, Doppler Filter Banks, Digital MTI Processing, Moving Target Detector, Limitations of MTI Performance, MTI from a moving Platform(AMTI), Pulse Doppler Radar.

UNIT III

TRACKING RADAR: Tracking with Radar, Monopulse Tracking, Conical Scan and Sequential Lobing, Limitations of Tracking Accuracy, Low-Angle Tracking, Tracking in Range, Other Tracking Radar Topics, and Comparison of Trackers.

UNIT IV

RECEIVERS AND DETECTION OF RADAR SIGNALS IN NOISE: The Radar Receiver, Noise Figure, Mixers, Low-Noise Front-Ends, Displays, Duplexers and Receiver Protectors; Matched-Filter Receiver, Correlation Detection, Detection Criteria, Detector Characteristics, Performance of Radar Operator, Automatic Detection, Constant-False-Alarm-Rate (CFAR) Receiver, ECMS & ECCMS.

UNIT V

INFORMATION FROM RADAR SIGNALS: Introduction, Basic Radar measurements, , Theoretical accuracy of Radar measurements, Ambiguity diagram, Pulse compression, Target recognition.

TEXT BOOKS:

1. Introduction to Radar systems by Merrill I. Skolnik, Second edition, Tata McGraw Hill.
2. Introduction to Radar systems by Merrill I. Skolnik, Third edition, Tata McGraw Hill.

REFERENCE SITES:

- 1) nptel.ac.in/courses/117105131/
- 2) onlinevideolecture.com/?course_id=403&lecture_no=33