

# Study & Evaluation Scheme

of

## Bachelor of Technology (Electronics & Communication)

[Applicable w.e.f. Academic Session 2009-10 till revised]



**TEERTHANKER MAHAVEER UNIVERSITY**

N.H.-24, Delhi Road, Moradabad, Uttar Pradesh-244001

Website: [www.tmu.ac.in](http://www.tmu.ac.in)



# TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)  
Delhi Road, Bagarpur, Moradabad (U.P)

## Study & Evaluation Scheme of Bachelor of Technology SUMMARY

Programme	:	B. Tech. ( Electronics & Communication)						
Duration	:	Four year full time (Eight Semesters)						
Medium	:	English						
Minimum Required Attendance	:	75 percent						
Credit	:							
Maximum Credit	:	264						
Minimum credit required for the degree	:	251						
Assessment	:	<table border="1"> <thead> <tr> <th>Internal</th> <th>External</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>25%</td> <td>75%</td> <td>100%</td> </tr> </tbody> </table>	Internal	External	Total	25%	75%	100%
Internal	External	Total						
25%	75%	100%						

Internal Evaluation (Theory Papers)	Class Test I	Class Test II	Assignment(s)	Other Activity (including attendance)	Total
	7.5 Marks	7.5 Marks	5 Marks	5 Marks	25 Marks

Evaluation of Practical/Dissertations & Project Reports	Internal	External	Total
	50	50	100

Duration of Examination	External	Internal
	3 hrs.	1 ½ hrs

To qualify the course a student is required to secure a minimum of 40 % marks in aggregate including the semester end examination and teachers continuous evaluation.(i.e. both internal and external).

A candidate who secures less than of 40% of marks in a course shall be deemed to have failed in that course. The student should have at least 50% marks in aggregate to clear the semester. In case a student has more than 40% in each course, but less than 50% overall in a semester , he/she shall re-appear in courses where the marks are less than 50% to achieve the required aggregate percentage of 50% in the semester.

### **Question Paper Structure**

- The question paper shall consist of eight questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question No. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer any five (weightage 3 marks each).
- Out of the rest seven questions, student shall be required to attempt any five questions. There will be minimum one and maximum two questions from each unit of the syllabus. The weightage of Question No. 2 to 8 shall be 12 marks each.

**Study & Evaluation Scheme**  
**Programme: B. Tech. (Electronics & Communication)**

**Semester I**

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EAS101	Mathematics-I	3	2	-	4	25	75	100
2	EAS102/	Physics	3	2	-	4	25	75	100
	EAS103	Chemistry							
3	EME101/	Engineering Mechanics	3	2	-	4	25	75	100
	EME102	Manufacturing Science							
4	ECS101	Computer Basics	3	2	-	4	25	75	100
5	EEE101/	Basic Electrical Engineering	3	2	-	4	25	75	100
	EEC101	Basic Electronic Engineering							
6	EHM101	English Communication-I	3	-	-	3	25	75	100
7	EAS151/	Physics (Lab)	-	-	4	2	50	50	100
	EAS152	Chemistry (Lab)							
8	EME151/	Engineering Mechanics(Lab)	-	-	4	2	50	50	100
	EME152	Engineering Drawing (Lab)							
9	ECS151	Computer Basics (Lab)	-	-	4	2	50	50	100
10	EEE151/	Basic Electrical Engineering (Lab)	-	-	4	2	50	50	100
	EEC151	Basic Electronic Engineering (Lab)							
11	ECE171	Discipline & General Proficiency	-	-	-	2	100	-	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>16</b>	<b>33</b>	<b>450</b>	<b>650</b>	<b>1100</b>

**Semester II**

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EAS201	Mathematics-II	3	2	-	4	25	75	100
2	EAS202/	Physics	3	2	-	4	25	75	100
	EAS203	Chemistry							
3	EME201/	Engineering Mechanics	3	2	-	4	25	75	100
	EME202	Manufacturing Science							
4	EAS204	Environmental Studies	3	2	-	4	25	75	100
5	EEE201/	Basic Electrical Engineering	3	2	-	4	25	75	100
	EEC201	Basic Electronic Engineering							
6	EHM201	English Communication-II	3	-	-	3	25	75	100
7	EAS251/	Physics (Lab)	-	-	4	2	50	50	100
	EAS 252	Chemistry (Lab)							
8	EME251/	Engineering Mechanics (Lab)	-	-	4	2	50	50	100
	EME252	Engineering Drawing (Lab)							
9	EME253	Workshop Practice (Lab)	-	-	4	2	50	50	100
10	EEE251/	Basic Electrical Engineering (Lab)	-	-	4	2	50	50	100
	EEC251	Basic Electronic Engineering (Lab)							
11	ECE271	Discipline & General Proficiency	-	-	-	2	100	-	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>16</b>	<b>33</b>	<b>450</b>	<b>650</b>	<b>1100</b>

### Semester III

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EEC301	Digital Logic & Circuits	3	2	-	4	25	75	100
2	EEE301	Circuit Theory	3	2	-	4	25	75	100
3	EEE302	Instruments & Measurements	3	2	-	4	25	75	100
4	ECS301	Discrete Mathematics	3	2	-	4	25	75	100
5	ECS304	Structured Computer Languages	3	2	-	4	25	75	100
6	EHM301	English Communication-III	3	-	-	3	50	50	100
7	EEC351	Digital Logic & Circuits (Lab)	-	-	4	2	50	50	100
8	EEE352	Instruments & Measurements(Lab)	-	-	4	2	50	50	100
9	ECS353	Computer Programming (Lab)	-	-	4	2	50	50	100
10	ECE371	Discipline/General Proficiency	-	-	-	2	100	-	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>12</b>	<b>31</b>	<b>425</b>	<b>575</b>	<b>1000</b>

### Semester IV

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EEC401	Signal and Systems	3	2	-	4	25	75	100
2	EEC402	Network Analysis & Synthesis	3	2	-	4	25	75	100
3	EEC404	Electronic Devices & Circuits	3	2	-	4	25	75	100
4	EEC405	Analog Communication Systems	3	2	-	4	25	75	100
5	EAS401	Mathematics III	3	2	-	4	25	75	100
6	EHM401	English Communication-IV	3	-	-	3	50	50	100
7	EEC451	Network Analysis & Synthesis (Lab)	-	-	4	2	50	50	100
8	EEC452	Electronic Devices & Circuits( Lab)	-	-	4	2	50	50	100
9	EEC453	Analog Communication Systems( Lab)	-	-	4	2	50	50	100
10	ECE471	Discipline/General Proficiency	-	-	-	2	100	0	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>12</b>	<b>31</b>	<b>425</b>	<b>575</b>	<b>1000</b>

### Semester V

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EEE501	Control System	3	2	-	4	25	75	100
2	EEC501	Microprocessor & Application	3	2	-	4	25	75	100
3	EEC502	Microwave Engineering	3	2	-	4	25	75	100
4	EEC503	Linear Integrated Circuits	3	2	-	4	25	75	100
5	EEC504	Digital Communication Systems	3	2	-	4	25	75	100
6	EHM501	English Communication-V	3	-	-	3	50	50	100
7	EEE551	Control System (Lab)	-	-	4	2	50	50	100
8	EEC551	Microwave Engineering (Lab)	-	-	4	2	50	50	100
9	EEC552	Digital Communication Systems (Lab)	-	-	4	2	50	50	100
10	EEC591	Industrial Training	-	-	-	4	100	100	200
11	ECE571	Discipline/ General Proficiency	-	-	-	2	100	-	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>12</b>	<b>35</b>	<b>525</b>	<b>675</b>	<b>1200</b>

### Semester VI

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EEC601	Neural Networks	3	2	-	4	25	75	100
2	EEC602	Antenna & Wave Propagation	3	2	-	4	25	75	100
3	EEC603	Analog Integrated Electronics	3	2	-	4	25	75	100
4	EEC604	Design of Electronic Systems	3	2	-	4	25	75	100
5	EEC605	Telecommunication Switching Systems	3	2	-	4	25	75	100
6	EHM601	English Communication-VI	3	-	-	3	50	50	100
7	EEC651	Neural Networks ( Lab)	-	-	4	2	50	50	100
8	EEC652	Analog Integrated Electronics ( Lab)	-	-	4	2	50	50	100
9	EEC653	Design of Electronic Systems (Lab)	-	-	4	2	50	50	100
10	ECE671	Discipline/ General Proficiency	-	-	-	2	100	-	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>12</b>	<b>31</b>	<b>425</b>	<b>575</b>	<b>1000</b>

## Semester VII

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EEC701	Digital Instrumentation	3	2	-	4	25	75	100
2	EEC702	Digital Signal Processing	3	2	-	4	25	75	100
3	EEC703	Mobile & Cellular Communication	3	2	-	4	25	75	100
<b>Lab</b>									
4	EEC751	Digital Instrumentation(Lab)	-	-	4	2	50	50	100
5	EEC752	Digital Signal Processing (Lab)	-	-	4	2	50	50	100
<b>Elective* I – Select any one course</b>									
7	EEC707	Embedded Systems	3	2	-	4	25	75	100
	ECS715	System Programming	3	2	-	4	25	75	100
<b>Elective* I– Lab- Same one as selected from column above</b>									
8	EEC753	Embedded Systems (Lab)	-	-	4	2	50	50	100
	ECS755	System Programming (Lab)	-	-	4	2	50	50	100
<b>Elective II – Select any one course</b>									
10	ECS704	Information Theory & Coding	3	2	-	4	25	75	100
	ECS705	Artificial Intelligence	3	2	-	4	25	75	100
	EEC706	Data Base Management System	3	2	-	4	25	75	100
11	EHM701	English Communication-VII	3	-	-	3	50	50	100
12	EEE791	Industrial Training			4	4	100	100	200
13	ECE771	Discipline & General Proficiency	-	-	-	2	50	-	50
<b>Total</b>			<b>18</b>	<b>10</b>	<b>16</b>	<b>35</b>	<b>525</b>	<b>675</b>	<b>1200</b>

\* The student has to opt the respective Lab of elective subject.

### Semester VIII

S. No.	Subject Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	EHM804	Principles of Management	3	2	-	4	25	75	100
2	EEC801	VLSI Technology	3	2	-	4	25	75	100
3	EEC803	Television & Consumer Electronics	3	2	-	4	25	75	100
<b>Lab</b>									
4	EEC851	VLSI Technology (Lab)	-	-	4	2	50	50	100
5	EEC852	Television & Consumer Electronics (Lab)	-	-	4	2	50	50	100
<b>Elective* I – Select any one course</b>									
6	EEC805	Optical Fiber Network	3	2	-	4	25	75	100
	ECS 810	Computer Networks	3	2	-	4	25	75	100
<b>Elective* I– Lab- Same one as selected from column above</b>									
7	EEC857	Optical Fiber Network (Lab)	-	-	4	2	50	50	100
	ECS861	Computer Networks (Lab)	-	-	4	2	50	50	100
<b>Elective II – Select any one course</b>									
8	EEC804	Satellite Communication	3	2	-	4	25	75	100
	EEC806	Advance Microprocessor and Microcontroller	3	2	-	4	25	75	100
9	EHM801	English Communication-VIII	3	-	-	3	50	50	100
10	EEE891	Project Work			4	4	100	100	200
11	ECE871	Discipline & General Proficiency	-	-	-	2	100	-	100
<b>Total</b>			<b>18</b>	<b>10</b>	<b>16</b>	<b>35</b>	<b>525</b>	<b>675</b>	<b>1200</b>

\* The student has to opt the respective Lab of elective subject.

## B. Tech. – Semester I MATHEMATICS-I

Course Code: EAS101

L	T	P	C
3	2	0	4

**Objective:** The objective behind the study of this subject is to solve all problems related to matrix, calculus, and vectors.

### Course Contents

#### Unit I

**Matrices:** Elementary row and column transformation, Rank of matrix, Linear dependence, Consistency of linear system of equations, Characteristic equation, Caley- Hamilton Theorem, Eigen values and Eigen vectors, Diagonalisation, Complex and unitary matrices.

(Lectures 08)

#### Unit II

**Differential Calculus-I:** Leibnitz theorem, Partial differentiation, Euler's theorem, Curve tracing, Change of variables, Expansion of function of several variables

(Lectures 08)

#### Unit III

**Differential Calculus-II:** Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (Simple applications).

(Lectures 08)

#### Unit IV

**Multiple Integrals:** Double and triple integral, Change of order, Change of variables, Beta and Gamma functions, Application to area, volume, Dirichlet integral and applications.

(Lectures 08)

#### Unit V

**Vector Calculus:** Point functions, Gradient, divergence and curl of a vector and their physical interpretations, Line, Surface and Volume integrals, Greens, Stokes and Gauss divergence theorem.

(Lectures 08)

### Text Books

1. Narayan Shanti, *A Text Book of Matrices*, S. Chand
2. Prasad C., *Mathematics for Engineers*, Prasad Mudralaya

### Reference Books

1. Kreyszig E., *Advanced Engineering Mathematics*, Wiley Eastern
2. Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers.
3. Piskunov N, *Differential & Integral Calculus*, Moscow Peace Publishers.



## B. Tech. – Semester I/II PHYSICS

Course Code: EAS102/202

L	T	P	C
3	2	0	4

**Objective:** The objective behind this subject is to know about basic physics like interference, diffraction, lasers etc.

### Course Contents

#### Unit I

**Relativistic Mechanics:** Inertial and Non- inertial Frames, Michelson-Morley Experiment, Postulates of Special Theory of Relativity, Galilean and Lorentz Transformation, Length Contraction and Time Dilation, Addition of Velocities, Mass Energy Equivalence and Variation of Mass with Velocity.

(Lectures 08)

#### Unit II

**Interference:** Coherent Sources, Conditions of Interference, Fresnel's Bi-prism Experiment, Displacement of Fringes, Interference in Thin Films – Wedge Shaped Film, Newton's Rings.

**Diffraction:** Single and n-Slit Diffraction, Diffraction Grating, Raleigh's Criterion of Resolution, Resolving Power of Telescope, Microscope and Grating.

(Lectures 08)

#### Unit III

**Polarization:** Phenomenon of Double Refraction, Ordinary and Extra-ordinary Rays, Nicol Prism, Production and Analysis of Plane, Circularly and Elliptically Polarized Light, Fresnel Theory, Optical Activity, Specific Rotation, Polari meter.

**Laser:** Principle of Laser Action, Einstein's Coefficients, Construction and Working of He-Ne and Ruby Laser.

(Lectures 08)

#### Unit IV

**Electromagnetic:** Ampere's Law and Displacement Current, Maxwell's Equations in Integral and Differential Forms, Electromagnetic Wave Propagation in Free Space and Conducting Media, Poynting Theorem.

(Lectures 08)

#### Unit V

**Magnetic Properties of Materials:** Basic Concept of Para- , Dia and Ferro-Magnetism, Langevin's Theory of Diamagnetism, Phenomenon of Hysteresis and Its Applications

**X-Rays:** Diffraction of X-Rays, Bragg's Law, Practical Applications of X-Rays, Compton Effect

(Lectures 08)

#### Text Books

1. Resnick Robert, *Introduction to Special Theory of Relativity*, Wiley
2. Beiser Aurthur, *Perspectives of Modern Physics*.
3. Ghatak A.K., *Optics*.

#### Reference Book

1. Wehr Richards & Adiaiv, *Physics of Atoms*.
2. Svelto O, *Lasers*.
3. Griffith D.J., *Electrodynamics*.

## B. Tech. – Semester I/II CHEMISTRY

Course Code: EAS103/203

L	T	P	C
3	2	0	4

**Objective:** The objective behind this subject is to study about basic chemistry, bonding, pollution etc.

### Course Contents

#### Unit I

Molecular theory of diatomic hetero-molecules, Bond theory of bonding in metals, Hydrogen bonding.

(Lectures 08)

#### Unit II

**Solid state Chemistry:** Radius Ratio Rule, Space lattice (only cubes), Type of unit cell, Bragg's Law, Calculation of Density of unit cell. One & Two Dimensional solids, graphite as two dimensional solid and its conducting properties. Fullerene & its applications. Structures of the following polymers, viz, Natural and synthetic rubbers, Polyamide and Polyester fibers, polymethylmethacrylate, poly acrylonitrile and polystyrene. A brief account of conducting polymers (polypyrrole & polytriphenyl) & their applications. Order & Molecularity of reactions. First & Second order reactions. Energy of activation. Phase Rule: Its application to one component system (Water). Equilibrium Potential, electrochemical cells (galvanic & concentration cells), Electrochemical theory of corrosion & protection of corrosion.

(Lectures 08)

#### Unit III

**Water Chemistry:** Hardness of water, softening of water by Lenny-S process & Reverse osmosis. Treatment of boiler feed water by Calgon process, Zeolites and ion-exchange resins. Classification of fuels, Coal, Biomass & Biogas. Determination of gross and net calorific values using Bomb Calorimeter.

(Lectures 08)

#### Unit IV

**Environmental pollution:** Types of pollution & pollutants, Air Pollution. Formation and depletion of ozone, smog and Acid rain.

**Toxic chemicals in Environment:** Basic concepts, Brief idea about the environmental impact of toxic chemicals specially, CO, NxOx, Sox, O<sub>3</sub>, Pesticides, Environmental Management

(Lectures 08)

#### Unit V

**Lubricants:** Introduction to lubricants, Mechanism of lubrication, Classification of lubricants, Flash and fire points, Selection of lubricants

(Lectures 08)

### Text Books

1. Morrison & Boyd, *Organic Chemistry*
2. Lee I.D., *Inorganic Chemistry*

### Reference Books

1. Barrow, *Physical Chemistry*
2. Manahan, *Environmental Chemistry*

**B. Tech. – Semester I/II**  
**ENGINEERING MECHANICS**

**Course Code: EME101/201**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to study about mechanics, force system, torsion, beams, trusses, frames etc.

**Course Contents**

**Unit I**

**Force system and Analysis:** Basic concept: Laws of motion. Transfer of force to parallel position. Resultant of planer force system. Free Body Diagrams, Equilibrium and its equation.

**Friction:** Introduction, Laws of Coulomb friction, Equilibrium of bodies involving dry fiction-Belt Friction.

**(Lectures 08)**

**Unit II**

**Structure Analysis: Beams;** Introduction, Shear force and Bending Moment, shear force and Bending Moment Diagram for statically determinate beams.

**Trusses:** Introduction, Simple Trusses, Determination of Forces in simple trusses members, methods of joints and method of section.

**(Lectures 08)**

**Unit III**

**Stress and Strain Analysis: Simple stress and strain;** Introduction, Normal shear stresses, stress-strain diagrams for ductile and brittle materials, Elastic constants, one dimensional loading of members of varying cross sections, strain Energy.

**(Lectures 08)**

**Unit IV**

**Compound stress and strains:** Introduction, state of plane stress, Principal stress and strain, Mohr's stress circle.

**Pure Bending of Beams:** Introduction, Simple Bending theory, Stress in Beams of different cross sections.

**(Lectures 08)**

**Unit V**

**Torsion:** Introduction, Torsion of Shafts of circular section, Torque and Twist, Shear stress due to Torque.

**(Lectures 08)**

**Text Books**

1. Ryder G. H., *Strength of Materials*
2. Singer F. L., *Strength of Materials*

**Reference Books**

1. Timoshenko, *Strength of Materials*
2. Shames, *Engineering Mechanics*
3. Schaum, *Outline Series*.

**B. Tech. – Semester I/II**  
**MANUFACTURING SCIENCE**

**Course Code: EME102/202**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** the objective behind this subject is to create awareness among students about manufacturing process like casting, metal forming, welding etc.

**Course Contents**

**Unit I**

**Basic Metals & Alloys:** Properties and Applications, Properties of Materials: Strength, elasticity, stiffness, malleability, ductility, brittleness, toughness, and hardness. Elementary ideas of fracture fatigue & creep

**(Lectures 08)**

**Unit II**

Introduction to Metal Forming & Casting Process and its applications,

**Metal Forming:** basic metal forming operations & uses of such as: Forging, Rolling, Wire & Tube-drawing/making and Extrusion, and its products/application. Press-work & die & punch assembly, cutting and forming, its application. Hot-working versus cold-working.

**Casting:** Pattern & allowance. Molding sands its desirable properties. Mould making with the use of core. Gating system, Casting defects & remedies. Cupola Furnace, Die-casting and its uses.

**(Lectures 08)**

**Unit III**

Introduction to machining & Welding and its applications.

**Machining:** basic principles of Lathe-machine and operations performed on it. Basic description of machines and operations of Shaper-Planner, Drilling, Milling & Grinding.

**Welding:** Importance & basic concepts of welding, classification of welding processes, Gas-welding, types of flames. Electric-Arc welding. Resistance welding, Soldering, & Brazing and its uses.

**(Lectures 08)**

**Unit IV**

**Introduction & Orthographic Projection:** Graphics as a tool to communicate ideas, Lettering and Dimensioning, Construction of geometrical figures like pentagon and hexagon. Principles of orthographic projections, Principal and auxiliary planes, first and third angle projections. Projection of points, Lines and solids.

**(Lectures 08)**

**Unit V**

Principles of isometric projection, Isometric projection using box and offset methods.

**(Lectures 08)**

**Text Books**

1. Hajra & Bose, *Workshop Technology, Vol 1 & 2*, Roy Media Promoters
2. Bhatt, N.D., *Elementary Engineering Drawing*, Charoathar Publishing

**Reference Books**

1. Raghuvanshi, B.S., *Workshop Technology, Vol 1 & 2*, Dhanpat Rai & Sons
2. Laxmi Narayan & Vaish W, *A Text Book of Practical Geometrical Drawing*

## B. Tech. – Semester I COMPUTER BASICS

Course Code: ECS101

L	T	P	C
3	2	0	4

**Objective:** The objective is to know the basics of computers & C programming language.

### Course Contents

#### Unit I

**Concepts in Computer & Programming; Computer Appreciation:** Definition of Electronic Computer, History, Generations, Characteristic and Application of Computers, Classification of Computers, Computer Hardware, CPU, RAM/ROM, Various I/O devices, Peripherals, Storage Media, Software Definition, Role and Categories, Firmware and Human ware.

(Lectures 08)

#### Unit II

**Programming Language Classification & Program Methodology; Computer Languages:** Generation of Languages, Translators, Interpreters, Compilers, Flow Charts, Dataflow Diagram, Assemblers, Introduction to 4GLs, Software Development Methodology, Life Cycles, Software Coding, Testing, maintenance.

**Digital Devices and Basic Network Concepts; Digital Fundamentals:** Various codes, decimal, binary, hexadecimal conversion, floating point numbers, Need for Data Transmission over distances, Types of Data Transmission, Media for Data Transmission (UTP, Optical, and Wireless).

**Data Communication & Networks:** Computer Networks, Networking of computers- Introduction of LAN and WAN. Network Topologies, Basic Concepts in Computer Networks, Client-server Architecture, and Mobile Communication.

(Lectures 08)

#### Unit III

**Internet and Web Technologies; Internet & World Wide Web:** Hypertext Markup Language, DHTML, WWW, Gopher, FTP, Telnet, Web Browsers, Net Surfing, Search Engines, Email.

(Lectures 08)

#### Unit IV

**Concepts in Operating System, Office Tools and Data Management; Introductory concepts in operating system & Data Management:** Elementary Concepts in Operating System, textual Vs GUI Interface, Introduction to DOS, MS Windows, MS office Tools, MS WORD, MS EXCEL, MS Power Point.

(Lectures 08)

#### Unit V

IT Industry Trends, Careers and Applications in India Basic Awareness of NICNET and ERNET. Application of IT to Areas like E Commerce, electronic governance, Multimedia, and Entertainment.

**Information Representation:** Introduction to Information representation in Digital Media, Text, image, graphics, Animation, Audio, Video etc., Introduction to JPEG, MPEG, MHEG, MP3 & AVI

(Lectures 08)

#### Text Books

1. Yadav, D S, *Foundations of IT*, New Age, Delhi
2. Curtin, *Information Technology: Breaking News*, Tata McGraw Hill
3. Rajaraman, *Introduction to Computers*, Prentice-Hall India

#### Reference Books

1. Nelson, *Data Compression*, BPB.
2. Peter Nortans, *Introduction to Computers*, TME
3. Leon & Leon, *Fundamental of Information Technology*, Vikas Publishing
4. Kanter, *Managing Information System*,
5. CIS Tems, *Internet: An Introduction*, Tata McGraw Hill.

**B. Tech. – Semester I/II**  
**BASIC ELECTRICAL ENGINEERING**

Course Code: EEE101/201

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to know the basics of electrical engineering, machines and their applications.

**Course Contents**

**Unit I**

**D.C. Network Theory:** Circuit theory concepts-Mesh and node analysis. Network Theorems- Superposition theorem. Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Star Delta transformation.

**(Lectures 08)**

**Unit II**

**Steady State Analysis of A.C. Circuits:** Sinusoidal and phasor representation of voltage and current: single phase A.C. circuit behaviour of resistance, inductance and capacitance and their combination in series & parallel and power factor, series parallel resonance-band width and quality factor: magnetic circuit.

**(Lectures 08)**

**Unit III**

**Measuring Instruments:** Construction and principle of operation of voltage and current measuring instruments; introduction to power and energy meters.

**Three Phase A.C. Circuits:** Star-Delta connections, line and phase voltage/current relations, three phase power and its measurement.

**(Lectures 08)**

**Unit IV**

**Transformer:** Principle of operation, types of construction, phasor diagram, equivalent circuit, efficiency and voltage regulation of single phase transformer, O.C. and S.C. tests.

**D.C. Machines:** Principle of electromechanical energy conversion, types of D.C. machines, E.M.F. equation, Magnetization and load characteristics, losses and efficiency, Starter and speed control of D.C. Motors, their applications.

**(Lectures 08)**

**Unit V**

**Three phase induction Motor:** Principle of operation, types and methods of starting, slip-torque characteristics, applications.

**Synchronous Machines:** Principle of Operation of Alternator and synchronous motor

**Single phase Motors:** Principle of operation and methods of starting of induction motor, Stepper motor and Universal motor.

**(Lectures 08)**

**Text Books**

1. Toro V. Del, *Principles of Electrical Engineering*, Prentice-Hall International.
2. Hayt W.H. & J.E. Kemmerly, *Engineering Circuit Analysis*, McGraw Hill.

**Reference Books**

1. Nagrath I.J., *Basic Electrical Engineering*, Tata McGraw Hill.
2. Fitzgerald A.E., D.E., Higginbotham & A Grabel, *Basic Electrical Engineering*, McGraw Hill.
3. Cotton H., *Advanced Electrical Technology*, Wheeler Publishing.

**B. Tech. – Semester I/II**  
**BASIC ELECTRONIC ENGINEERING**

**Course Code: EEC101/EEC201**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to know the basics of electronics engineering like components, devices and their applications.

**Course Contents**

**Unit I**

**PN Junction:** Introduction to PN-Junction, depletion layer, v-I characteristics Diode Ratings (average current, peak-inverse voltage) p-n junction as rectifiers (half wave and full wave), filter, calculation of ripple factor and load regulation, clipping and clamping circuits. Zener diode and its application as shunt regulator.

**(Lectures 08)**

**Unit II**

**Bipolar Junction Transistor (BJT):** Basic construction, transistor action, CB, CE and CC configurations, input/output characteristics, Biasing of transistors, Fixed bias, emitter bias, potential divider bias, Graphical analysis of CE amplifier, concept of Voltage gain current gain,  $\lambda$ -parameter model (low frequency). Computation of  $A_i$ ,  $A_v$ ,  $R_i$ ,  $R_o$  of single transistor CE amplifier configuration

**(Lectures 08)**

**Unit III**

**Field Effect Transistor (FET):** Basic construction of JFET, Principle of working, concept of pinch-off maximum drain saturation current, input and transfer characteristics, Characteristics equation, CG, CS and CD Configuration, fixed and self biasing of JFET amplifier Introduction of MOSFET, Depletion and Enhancement type MOSFET- Construction, Operation and Characteristics

**(Lectures 08)**

**Unit IV**

**Operational Amplifier (Op-Amp):** Concept of ideal operational amplifier, ideal and practical Op-Am parameters, inverting, non-inverting and unity gain configurations. Applications of Op-Amp as adders, difference amplifiers, integrators and differentiator.

**(Lectures 08)**

**Unit V**

**Switching Theory:** Number system, conversion of bases(decimal, binary, octal and hexadecimal numbers), Adder & Subtraction, BCD numbers, Seven Segment Display, Boolean Algebra, Logic gates, Concept of universal gates, Canonical forms, minimization using K-Map

**(Lectures 08)**

**Text Books**

1. Millman & Halkias, *Integrated Electronics*, McGraw Hill
2. Millman & Halkias, *Electronics Devices and Circuits*, McGraw Hill
3. Morris Mano M., *Digital Design*.

**Reference Books**

1. Sedra and Smith, *Microelectronic Circuits*
2. Gayakwad, R A, *Operational Amplifiers and Linear Integrated circuits*, PHI
3. Chattopadhyay D and P C Rakshit, *Electronics Fundamentals and Applications*, New Age International.

## B. Tech. – Semester I ENGLISH COMMUNICATION-I

Course Code: EHM101

L	T	P	C
3	0	0	3

**Objective:** The objective is to study the English in professional manner like technical writing, sentence, paragraph, articles etc.

### Course Contents

#### Unit I

**Pre-Requisites of Technical Written Communication:** Vocabulary Building: Homophones (Words Similar in sound but different in Meanings); Word-formation; One-Word substitute; New & Select Vocabulary Building (about 500 words)

(Lectures 06)

#### Unit II

**Functional Grammar:** Patterns and Correct usage (Parts of speech); Syntax Concord; Prepositions; Articles.

(Lectures 06)

#### Unit III

**Requisites of Good Sentence and Paragraph Writing:** Requisites of Good Sentence Writing; Paragraph Writing; Unity, Coherence and Emphasis; Development of Paragraph: Inductive Order, Deductive Order, Spatial, Linear, Chronological Orders etc. with Emphasis on Argumentative & Expository Writing. Language Learning through Thematic and Value based Critical Reading (Non-Detailed Text Study)

(Lectures 06)

#### Unit IV

Study of following Short Stories for making the Students acquaint with the styles of great Writers of World:

**O.H. Henry:** The Last Leaf

**R.N. Tagore:** The Renunciation

**M.R. Anand:** The Barber's Trade Union

(Lectures 06)

#### Unit V

**Dimensions of Spoken English:** Stress, Intonation, Rhythm, Phone, Allophones, Phonetic Transcription, Listening, Reading & Comprehension of Speech and Reproduction of Response.

(Lectures 06)

#### Texts Books

1. Singh R.P, *An Anthology of English Short Stories*, Oxford University Press, New Delhi.
2. Hornby A.S., *Guide to Patterns & Usage in English*, Oxford University Press, New Delhi
3. Martin & Wren, *High I English Grammar & Composition*, S.Chand. Co., Delhi

#### Reference Books

1. Ruther Ford A., *Basic Communication Skills*, Person Education, New Delhi.
2. *Functional Skills in Language & Literature*, Oxford University Press, New Delhi

#### \*Note:

#### Internal Marking

There shall be a continuous evaluation and the marking would be as follows.

#### Marks 50

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks**- Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.



**B. Tech. – Semester I/II  
PHYSICS (LAB)**

**Course Code: EAS151/251**

**L     T     P     C**  
**0     0     4     2**

**List of Experiments**

1. Wave Length of Sodium Lamp by Newton's ring.
2. Determine the wave length of Sodium light by Fresnel's Bi-prism.
3. Determine of the Specific Rotation of the Cane sugar solution with the help of Polari meter.
4. Determine the wave length of the sodium lamp by Michelson interferometer.
5. PN junction characteristic Apparatus
6. High resistance by Leakage method.
7. Energy Band gap by four prove method.
8. Determine Magnetic field using Stewart and Gee's apparatus.
9. Determine the frequency of A.C. mains by means of a Sonometer.
10. Hall Effect experiment.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester I/II  
CHEMISTRY (LAB)**

Course Code: EAS152/252

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

(Any 10 experiments of the following or such experiments suitably designed)

**List of Experiments**

1. Determination of alkalinity in the given water sample.
2. Determination of temporary and permanent hardness in water sample using EDTA as standard solution.
3. Determination of available chlorine in bleaching powder.
4. Determination of chloride content in the given water sample by Mohr's method.
5. To determine pH of the solution using pH meter and pH-metric titration.
6. Determination of Equivalent weight of Iron by the chemical displacement method.
7. Viscosity of an addition polymer like polyester by Viscometer.
8. Determination of the dissolved oxygen present in a water sample.
9. To find the melting and Eutectic Point for a two component system by using method of cooling curve.
10. To determine the viscosity of a given sample of a lubricating oil using Redwood Viscometer.
11. To determine flash point of the given lubricating oil by Penskey –Marten's apparatus.
12. To find chemical oxygen demand of waste water sample by potassium dichromate.
13. Determination of temporary and permanent hardness in water sample using complexometric method.
14. Determination of iron content in the given sample using external indicator.
15. Determination of strength of given HCL solution by titrating against N/10 Standard sodium hydroxide solution.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester I/II**  
**ENGINEERING MECHANICS (LAB)**

**Course Code: EME151/251**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**(Any 10 experiments of the following or such experiments suitably designed)**

**List of Experiments**

1. To conduct the tensile test and determine the ultimate tensile strength, percentage elongation for a steel specimen.
2. To determine the compression test and determine the ultimate compressive strength for a specimen
3. To conduct the Impact-tests (Izod / Charpy) on Impact-testing machine to find the toughness.
4. To determine the hardness of the given specimen using Vicker/ Brinell/Rockwell hardness testing machine.
5. Friction experiment(s) on inclined plane and/or on screw-jack.
6. Worm & worm-wheel experiment for load lifting.
7. Torsion of rod/wire experiment.
8. Experiment on Trusses.
9. Study of 2-stroke and 4 –stroke I.C.E. models.
10. To determine the velocity ratio, mechanical advantage & efficiency of a single purchase crab apparatus & draw a graph of load vs effort, mechanical advantage and efficiency.
11. To determine the velocity ratio, mechanical advantage & efficiency of a double purchase crab apparatus.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester I/II**  
**ENGINEERING DRAWING (LAB)**

**Course Code: EME152/252**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**Course Contents**

**Introduction:** Graphics as a tool to communicate ideas, Lettering and dimensioning, Construction of geometrical figures like pentagon and hexagon.

**Orthographic Projection:** Principles of orthographic projections, Principal and auxiliary planes, First and Third angle projections. Projection of points. Pictorial view. Projection of lines parallel to both the planes. Parallel to one and inclined to other, Inclined to both the planes. Application to practical problems. Projection of solid in simple position, Axis or slant edge inclined to one and parallel to other plane, Solids lying on a face or generator on a plane. Sectioning of solids lying in various positions, True shape of the section. Development of lateral surfaces, sheet metal drawing.

**Isometric Projection:** Principles of isometric projection, Isometric projection using box and offset methods.

**Reference Books**

1. Bhatt. N.D., *Elementary Engineering Drawing*, Charoathar Publishing.
2. Laxmi Narayan V & Vaish W., *A Text Book of Practical Geometry on Geometrical Drawing*.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

## B. Tech. – Semester I COMPUTER BASICS (LAB)

Course Code: ECS151

L	T	P	C
0	0	4	2

### Course Contents

1. Write a Program (WAP) to calculate temperature in Fahrenheit to Celsius using formula  $C = (F - 32) / 1.8$ .
2. WAP to calculate Sum & average of N numbers.
3. WAP to calculate roots of quadratic equation  $ax^2 + bx + c = 0$ .  
 $b^2 - 4ac > 0$  real root  
 $b^2 - 4ac < 0$  imaginary root
4. WAP to convert integer arithmetic to a given number of day and month.
5. WAP to find maximum out of 3 numbers a, b & c.
6. WAP to find minimum out of 3 numbers a, b & c.
7. WAP to find  $e^b$ .
8. WAP to find factorial of positive integer.
9. WAP to find sum of series up to n number,  $2 + 5 + 8 + \dots + n$ .
10. WAP to print all the number between 1 to 100 which are dividing by 7.
11. WAP to generate Fibonacci series up to n.
12. WAP to find position in class first = 360, second = 240, third = 120 otherwise fail. Read marks of 3 subjects.
13. Write a function to calculate area of circle.
14. Write an iterative function to calculate factorial of given number.
15. Write a recursive function to calculate factorial of given number.
16. WAP to find whether number is prime or not.
17. WAP to find even & odd up to a given limit.
18. WAP to find that the enter character is a letter or digit.
19. WAP to find addition of two matrix of n\*n order.
20. WAP to find multiplication of two matrix of n\*n order.
21. WAP to add 6 digit numbers in even case & multiple 6 digit number in odd case.
22. WAP to find even or odd up to a given limit n.
23. WAP to find whether a given no is palindrome or not.
24. WAP that uses a function to sort an array of integer.
25. WAP to illustrate the concept of structure.
26. WAP to joining the 2 string.
27. WAP to comparing of 2 strings.
28. WAP to illustrate the properties of static variable.
29. WAP to find length of string.
30. WAP to illustrate the pointer.

### Evaluation of Practical Examination:

#### Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

#### Evaluation Scheme

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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#### External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester I/II**  
**BASIC ELECTRICAL ENGINEERING (LAB)**

**Course Code: EEE151/251**

**L     T     P     C**  
**0     0     4     2**

**List of Experiments**

1. To study the Super position theorem.
2. To study the reciprocity theorem.
3. To study the Maximum Power theorem.
4. To study the Norton's theorem.
5. To study the Thevenin theorem.
6. To study the KCL & KVL.
7. Determination of Parameter and losses in a Single Phase Transformer OC & SC test.
8. Speed control of D.C Shunt Motor.
9. Block Rotor of test of 3 Ø Induction Motor.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester I/II**  
**BASICS ELECTRONIC ENGINEERING (LAB)**

Course Code: EEC151/251

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

1. V-I characteristics of P-N junction diode
2. Application of diode as clipper clamper
3. Half wave & Full wave rectifier
4. I/P & O/P characteristics of transistor in CB configuration
5. I/P & O/P characteristics of transistor in CE configuration
6. Verify the truth table of half adder & full adder
7. OP-amp as inverting & non Inverting amplifier using IC 741)
8. OP-amp as differentiator & Integrator
9. Zener of diode as a Shunt Regulator

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester I**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE171**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)



## B. Tech. – Semester II MATHEMATICS- II

Course Code: EAS201

L	T	P	C
3	2	0	4

**Objective:** The objective behind the study of this subject is to solve all problems related to Diff. equation, different series.

### Course Contents

#### Unit I

**Differential Equations:** Ordinary differential equations of first order, Exact differential equations, Linear differential equations of first order, Linear differential equations of nth order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solutions of second order differential equations by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation).

(Lectures 08)

#### Unit II

**Series Solutions and Special Functions:** Series solutions of ODE of 2<sup>nd</sup> order with variable coefficients with special emphasis to differential equations of Legendre, and Bessel. Legendre polynomials, Bessel's functions and their properties.

(Lectures 08)

#### Unit III

**Laplace Transform:** Laplace transform, Existence theorem, Laplace transform of derivatives and integrals, Inverse Laplace transform, Unit step function. Dirac delta function, Laplace transform of periodic functions, Convolution theorem, Application to solve simple linear and simultaneous differential equations.

(Lectures 08)

#### Unit IV

**Fourier Series and Partial Differential Equations:** Periodic functions, Trigonometric series, Fourier series of period  $2p$ , Euler's formulae, Functions having arbitrary period, Change of interval, Even and odd functions, Half range sine and cosine series.

Introduction of partial differential equations, Linear partial differential equations with constant coefficients of 2<sup>nd</sup> order and their classifications – parabolic, elliptic and hyperbolic with illustrative examples.

(Lectures 08)

#### Unit V

**Applications of Partial Differential Equations:** Method of separation of variables for solving partial differential equations, Wave equation up to two dimensions, Laplace equation in two-dimensions, Heat conduction equations up to two-dimensions, Equations of transmission Lines.

(Lectures 08)

### Text Books

1. Kreyszig E., *Advanced Engineering Mathematics*, Wiley Eastern
2. Grewal, B.S., *Higher Engineering Mathematics*, Khanna Publication.

### Reference Books

1. Prasad C. *Advanced Mathematics for Engineers*, Prasad Mudralaya
2. *A Textbook of Differential Equations*, Pitamber Publications.

**B. Tech. – Semester II**  
**ENVIRONMENTAL STUDIES**

**Course Code: EAS204**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** To create awareness among students about ecology, environment & various type of pollutions.

**Course Contents**

**Unit I**

**General:** Definition, Scope, Segments of Environment and its Multidisciplinary Nature Some Major Environmental Problems **(Lectures 08)**

**Unit II**

**Ecology And Environment:** Concept of an Ecosystem- its components and functions Tropic Levels- Producer, Consumer and Decomposer Energy and Nutrient Flow in an Ecosystem, Biogeochemical Cycles, Food Chain, Food Web and Ecological Pyramid **(Lectures 08)**

**Unit III**

**Air Pollution:** Various segments of Atmosphere and their Significance Classification of Pollutants in Air – their sources, toxic effects, sampling and analysis, Stationary and Mobile Sources and their Control Photochemical and Sulphurous Smog, Acid Rain Indoor Air Quality Greenhouse Effect and Global Warming Ozone Layer – Its Depletion and Control Measures. **(Lectures 08)**

**Unit IV**

**Water Pollution:** Water Resources of the Earth and Indian Scenario Point and non-Point sources of Pollution; Various Pollutants and their Toxic Effects Water Quality- DO and its significance, BOD and COD and their measurement Water Quality in Rivers and Lakes- DO sag, Eutrophication, Thermal Stratification, Mixing in Lakes and its Consequences, Designated Best Use (CPCB Criteria) Portability of Water- Municipal Water Supply Wastewater – Characteristics, Primary and Secondary Treatment Rainwater Harvesting; Natural Resources and Bio-Diversity, Renewable and non-Renewable Resources, Sustainable Development Forest Resources, Deforestation- causes and effects Bio-Diversity- Its Importance, Threats and Conservation; Dams and Reservoirs- Their Benefits and Problems. **(Lectures 08)**

**Unit V**

A Brief Introduction To Noise Pollution, Soil Pollution And Solid Waste Management Measures for Protection of Environment Development with protection of environment- social issues. Legal frame work for environmental protection in India. Brief introduction to Acts for environmental protection.

**Project Preparation** **(Lectures 08)**

**Text Books**

1. Masters, G.M., *Introduction to Environmental Engineering and Science*, Prentice Hall India Pvt. Ltd.
2. Odem, E.P., *Fundamentals of Ecology*, W. B. Sannders Co.

**Reference Books**

1. Bryant,P.J., *Biodiversity and Conservation*, Hypertext Book
2. Tewari, Khulbe & Tewari, *Textbook of Environment Studies*, I.K. Publication
3. Trivedi R.K., *Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II*, Environment Media

**B. Tech. – Semester II**  
**ENGLISH COMMUNICATION- II**

Course Code: EHM201

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:** The objective of the course is to edify the technical writing skills through writing of official letters and scientific research papers.

**Course Contents**

**Unit I**

Technical Communication Nature; Origin and Scope; Feature and General Writing; Significance; Style: Objective Style as Contrary to Literary Composition. Forms of Technical Communication, Distinction between formal and informal writing. Essay Writing. (Lectures 06)

**Unit II**

**Reports:** Types, Significance, Structure & Style of Report;

**Writing of Reports:** Project, Thesis, Dissertation Writing;

(Lectures 06)

**Unit III**

**Technical Paper & Scientific Article Writing:** Elements, Methods & Technical Objectives; Technical Proposal: Nature, Divisions, Kinds, and Uses. (Lectures 06)

**Unit IV**

**Business Correspondence:** Principles; Features; Sales and Credit Letters: Letters of Enquiry, Quotation, Order, Claim, Complaint and Adjustment letters, Bio-Data Making, Resumes/Job Application Processing.

(Lectures 06)

**Unit V**

Language Learning through Thematic and Value based Critical Reading (Non-Detailed Text Study):

A Study of following Value –Oriented Essays:

S. Radhakrishnan : The Gandhian Outlook

J.B. Priestley : Making Writing Simple

C.E.M. Joad : The Civilization of Today

(Lectures 06)

**Texts Books**

1. Singh R.P, *An Anthology of English Essays*, Oxford University Press, New Delhi
2. Singh R P, *An Anthology Short Stories*, Singh R P, OUP, New Delhi.
3. Krishna Mohan and Mamta Banerjee, *Developing Communication Skills*, Macmillan India Ltd., Delhi.

**Reference Books**

1. Arora V.N. et al, *Improve Your Writing*, OUP, Delhi
2. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi.

**\*Note:**

**Internal Marking**

There shall be a continuous evaluation and the marking would be as follows.

**Marks 50**

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks-** Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

**B. Tech. – Semester II**  
**WORKSHOP PRACTICE (LAB)**

Course Code: EME253

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

**Carpentry Shop:**

1. Study of tools & operations and carpentry joints.
2. Simple exercise using jack plane.
3. To prepare half-lap corner joint, mortise & joints.
4. Simple exercise on woodworking lathe.

**Fitting Bench Working Shop:**

1. Study of tools & operations
2. Simple exercises involving fitting work.
3. Make perfect male-female joint.
4. Simple exercises involving drilling/tapping

**Black Smithy Shop:**

1. Study of tools & operations
2. Simple exercises base on black smithy operations such as upsetting, drawing down, punching, bending & swaging.

**Welding Shop:**

1. Study of tools & operations of Gas welding & Arc welding
2. Simple butt and Lap welded joints.
3. Oxy-acetylene flame cutting.

**Sheet-metal Shop:**

1. Study of tools & operations.
2. Making Funnel complete with ‘soldering’.
3. Fabrication of tool-box, tray, electric panel box etc.

**Machine Shop:**

1. Study of machine tools and operations.
2. Plane turning.
3. Step turning
4. Taper turning.
5. Threading

**Foundry Shop:**

1. Study of tools & operations
2. Pattern making.
3. Mould making with the use of a core.
4. Casting

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE 10 MARKS)</b>	<b>QUIZ ( 5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination.

**B. Tech. – Semester II**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE271**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)

**B. Tech Semester III**  
**DIGITAL LOGIC & CIRCUITS**

**Course Code: EEC301**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to know the basics of digital circuit logic gates and their applications

**Course Contents**

**Unit I**

Introduction to Combinational Logic, Boolean Algebra, Gates, Logic Diagrams NAND & NOR implementations, Simplification of Expressions, Truth Tables, K-maps, Don't cares, Multi-output synthesis and analysis. **(Lectures 08)**

**Unit II**

Introduction to multiplexers, Introduction to CAD tools and VHDL, NMOS and CMOS gates. Transmission Gates, Decoders, Encoders, Multiplexers, Shannon's Expansion VHDL for Combinational Circuits. **(Lectures 08)**

**Unit III**

Electrical Considerations Multi-level logic Arithmetic Logic, Comparators Hazards and Glitches SPRING BREAK ROMs & PROMs Programmable Logic Devices. **(Lectures 08)**

**Unit IV**

Introduction to Sequential Logic Latches and Flip Flops Latches and Flip Flops Continued Registers & Counters, VHDL & CAD tools Analysis of Sequential Logic State, Transition, and Excitation Tables State Diagrams. **(Lectures 08)**

**Unit V**

**Design of Sequential Logic:** Counters, Universal Counters, Sequence Detectors, State Reduction, Binary Assignment, Excitation Equations. **(Lectures 08)**

**Text Book**

1. Morris M. Mano & M. D. Ciletti, *Digital Design*, Pearson Education
2. Anand A., *Fundamental of Logic Circuits*,

**Reference Book**

1. Brown and Vranesic, *Fundamentals of Digital Logic with VHDL Design*, McGraw-Hill.

## B. Tech Semester III CIRCUIT THEORY

Course Code: EEE301

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to study about the basics of circuit theory laws and their applications.

### Course Contents

#### Unit I

**Basic Principles:** Units, definitions and sign conventions. Ideal independent voltage and current sources. Practical voltage and current sources. Kirchoff's voltage and current laws. Current and voltage dividers. The superposition theorem and linearity. Mesh analysis for circuits with voltage sources and resistors. Matrix notation for mesh equations. Gaussian elimination. Nodal analysis for circuits with current sources and resistors. Analysis of circuits with both current and voltage sources  
(Lectures 08)

#### Unit II

**Dependent Sources:** Types of dependent source; the operational amplifier and bipolar transistors as applications of dependent sources; Inverting and non-inverting op amp amplifiers; Mesh and nodal analysis with dependent sources; Superposition with dependent sources .  
(Lectures 08)

#### Unit III

**The venin And Norton Theorems:** The venin's theorem; Source transformation; The venin's theorem with dependent sources; Norton's theorem; Analysis of ladder networks.  
(Lectures 08)

#### Unit IV

**AC Theory:** Inductors and capacitors; Inductors and capacitors in series and parallel; Mutual inductance; Properties of sine waves; Sinusoidal excitation of RL and RC circuits; AC theory; Impedance and admittance; AC analysis of RLC circuits; Resonant RLC circuits; Q factor; Phasor diagrams; Power in AC circuits; Complex power; Nodal and mesh analysis on AC circuits; The venin's theorem on AC circuits.  
(Lectures 08)

#### Unit V

**Step Response of RI And RC Circuits:** Analysis of source-free RC and RL circuits; Time constant of an RC and RL circuit; The unit step forcing function; Step response of RL and RC circuits.  
(Lectures 08)

#### Text Books

1. Dorf R C, Svoboda J, *A Introduction to Electric Circuits*, Wiley, 2006.
2. Nilsson J.W.& Riedel S.A., *Electric Circuits*, Prentice-Hall, 2000.

#### Reference Books

1. Hayt W H & Kemmerly J E, *Engineering Circuit Analysis*, McGraw-Hill, 2002.
2. Senturia S D, Wedlock B.D. *Electronic Circuits and Applications*, Wiley, 1975

## B. Tech Semester III INSTRUMENTS & MEASUREMENTS

Course Code: EEE302

L	T	P	C
3	2	0	4

**Objective:** The main objective of this subject is to study about electrical instruments like ammeter, voltmeter, wattmeter, CRO etc & measurement.

### Course Contents

#### Unit I

**Philosophy of Measurement:** Methods of Measurement, Measurement System, Classification of instrument system, Characteristic of instrument & measurement system, Errors in Measurement & its Analysis, Standards. Analog Measurement of Electrical.

**Quantities:** Electrodynamic, Thermocouple Electrostatic & rectifier type Ammeters & Voltmeters, Electrodynamic Wattmeter, Three Phase Wattmeter, Power in three Phase System, Errors & remedies in Wattmeter and energy meter. (Lectures 08)

#### Unit II

Instrument Transformer and their application in the extension of instrument range, Introduction to measurement of speed, Frequency and Power factor. (Lectures 08)

#### Unit III

**Measurement of Parameter:** Different methods of measuring low, medium and high resistances, Measurement of Inductance & Capacitance with the help of AC Bridge, Q Meter. (Lectures 08)

#### Unit IV

**AC Potentiometer:** Polar type & Co-ordinate type AC potentiometer, Application of AC Potentiometers in Electrical measurement.

**Magnetic Measurement:** Ballistic Galvanometer, Flux meter, Determination of Hysteresis loop, Measurement of iron losses. (Lectures 08)

#### Unit V

**Digital Measurement of Electrical Quantities:** Concept of digital Measurement, Block Diagram Study of digital voltmeter, frequency meter power analyzer and harmonics analyzer; Electronic Multimeter. Cathode Ray Oscilloscope: Electronic multimeter , Power Analyzer, Harmonics analyzer , Electronic multimeter , Power Analyzer, Harmonics analyzer , Basic CRO circuit (Block Diagram), Cathode ray tube (CRT) & its component , Application of CRO in measurement ,Lissajous Pattern., Dual trace & dual beam Oscilloscope. (Lectures 08)

### Text Book

1. Golding E.W. & Widdis F.C., *Electrical Measurement & Measuring Instrument*, A.W. Wheeler & Co. Pvt. Ltd. India.
2. Sawhney A.K., *Electrical & Electronic Measurement & Instrument*, Dhanpat Rai & Sons.

### Reference Books

1. Forest K. Harries, *Electrical Measurement*, Willey Eastern Pvt. Ltd. India.
2. Stout M.B., *Basic Electrical Measurement*, Prentice hall of India, India.
3. Cooper W.D., *Electronic Instrument & Measurement Technique*, Prentice Hall International.
4. Prashad Rajendra, *Electrical Measurement & Measuring Instrument*, Khanna Publisher.
5. Gupta J.B., *Electrical Measurements and Measuring Instruments*, S.K. Kataria & Sons.



## B. Tech Semester III DISCRETE MATHEMATICS

Course Code: ECS301

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** Discrete mathematics has become popular in recent decades because of its applications to computer science. Concepts and notations from discrete mathematics are useful in studying and describing objects and problems in computer algorithms and programming languages, and have applications in cryptography, automated theorem proving, and software development.

### Course Contents

#### Unit I

**Propositional Calculus:** Propositions, Truth tables, Logical Equivalence, Logical implications, Algebra of propositions, Conditional propositions, Converse, Inverse, Contra-positive, Bi conditional statements, Negation of Compound statements, Tautologies and Contradiction, Normal Form, Arguments, Fallacies, Quantifiers, Mathematical Induction. (Lectures 08)

#### Unit II

**Boolean Algebra and Circuits:** Boolean Algebra, Boolean Expression, Logic Gates, Logic Circuits, Boolean Functions, Sum of Product and Product of Sum Forms, Canonical Forms, Simplification of functions using K-Map. (Lectures 08)

#### Unit III

**Set Theory:** Basic concepts of Set theory, some operations on sets, Venn diagram, Basic Set identities, Cartesian product. Relation Definition, Types of relation, Pictorial representation of relation, Composition of Relation, Equivalence relation. Function Definition, Classification of function, Types of function (one to one, many to one, into, onto, objective), Composition of function, Inverse function, Identity function. (Lectures 08)

#### Unit IV

**Combinatorics:** Fundamental principles, Permutation and Combination, Recurrence Relation, Generating Function, Binomial Theorem. (Lectures 08)

#### Unit V

**Graphs and Trees:** Introduction to graphs, Graph terminology, Application of Graphs, Finite and Infinite graphs, Incidence and Degree, Isolated vertex, Pendent Vertex, and Null graph. Trees and their properties, Rooted and Binary trees, Tree traversal (Pre order, Post order, in order). (Lectures 08)

### Text Books

1. Sarkar, *Discrete Mathematics*, S Chand.
2. Deo Narsingh, *Graph Theory with Applications to Engineering and Comp. Science*, PHI.
3. Seymour Lipschutz & Marc Lipson Schaum *Discrete Mathematics*, Outline Series TMH.

### Reference Books

1. Liu C.L., *Elements of Discrete Mathematics*.
2. Dean Neville, *Essence of Discrete Mathematics*, Prentice Hall.
3. Rosen Kenneth H., *Discrete Mathematics and Its Applications*, McGraw Hill.
4. Johnsonbaugh Richard, *Discrete Mathematics*, Macmillan.

**B. Tech Semester III**  
**STRUCTURED COMPUTER LANGUAGES**

Course Code: ECS304

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Course Contents**

**Unit I**

**Data and data types:** definitions, data, data types, integer, character, float, string, etc., constants and variables. Declaration, statement, integer constant, variable, integer, expression, assignment, Boolean type, tokens, keywords, identifiers.

**(Lectures 08)**

**Unit II**

**Control Structure:** while statement, if statement, else statement. Nested logic: for loop, do- while loop, loop inside a loop structure, operators and expressions.

**(Lectures 08)**

**Unit III**

**Arrays and Strings:** declaration, initialization. String handling: comparison, concatenation, copy, finding length of string.

**(Lectures 08)**

**Unit IV**

**Sequence Control:** user defined functions, library functions. Functions: definition, declaration, returns values and their types. Function calls. Recursion, pointers.

**(Lectures 08)**

**Unit V**

Elementary and structure data type. Structures and union, enumerations. File and file structure: opening, closing, input/output operations on file.

**(Lectures 08)**

**Text Books**

1. Balaguru Swamy E., *Programming with ANSI C*, TMH Publications.
2. Yashwant Kantikar, *Let Us C*, BPB Publications.

**Reference Book**

1. John Pratt, *Principle of Programming Languages*, PHI Publications.

## B. Tech. Semester III ENGLISH COMMUNICATION-III

Course Code: EHM301

L	T	P	C
3	0	0	3

**Objective:** The objective behind the course is to improve the Vocabulary skills, conversational skills and business correspondence of students.

### Course Contents

#### Unit I

Vocabulary: Spelling Rules, Vocabulary building, Word Formation, Prefix, Suffix, Compound words.

(Lectures 06)

#### Unit II

Synonyms, Antonyms, Idioms, Phrases, Proverbs, Use of Adverb 'too', Homophones, Homonyms, Paroxysm. One word substitution, Words often confused.

(Lectures 06)

#### Unit III

**Dictionary Elements:** How to look up a dictionary.

Figure of speech: Simile, Metaphor, Personification, Apostrophe, Hyperbole, Onomatopoeia, Oxymoron.

(Lectures 06)

#### Unit IV

Writing skills, Writing Single- sentence Definition. Factual description of Objects, Process, Experiments  
Expansion of (an idea into a) passage, Dialogue Writing.

(Lectures 06)

#### Unit V

Value based Reading

Short Stories: "The Rocking Horse Winner", D.H.Lawrence

"The Capital of the World", Ernest Hemingway

Essay: "Science and Human Life", J.B.S.Haldane

(Lectures 06)

### Texts Books

1. Singh R.P, *An Anthology of English Essay*, Oxford University Press, New Delhi.
2. Singh R P, *An Anthology short stories*, Singh R P, OUP, New Delhi.
3. Ruther Ford A., *Basic Communication Skills*, Person Education, New Delhi.

### Reference Books

1. Arora V.N. et al, *Improve Your Writing*, OUP, Delhi
2. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi

### \*Note:

### Internal Marking

There shall be a continuous evaluation and the marking would be as follows.

### Marks 50

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks-** Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

**B. Tech Semester III**  
**DIGITAL LOGIC & CIRCUITS (LAB)**

Course Code: EEC351

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

1. Study of following combinational circuits: Multiplexer, Demultiplexer and Encoder. Verify truth tables of various logic functions.
2. Study of various combinational circuits based on: AND/NAND Logic blocks and OR/NOR Logic blocks.
3. To study various waveforms at different points of a transistor bistable multivibrator and its frequency variation with different parameters.
4. To design a frequency divider using IC-555 timer.
5. To study various types of registers and counters.
6. To study Schmitt trigger circuit.
7. To study transistor as table multi-vibrator.
8. Experimental study of characteristics of CMOS integrated circuits.
9. Interfacing of CMOS to TTL and TTL to CMOS.
10. BCD to binary conversion on digital IC trainer.
11. Testing of digital IC by automatic digital IC trainer.
12. To study OP-AMP as Current to Voltage & Voltage to Current converters & comparator.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech Semester III**  
**INSTRUMENT & MEASUREMENTS (LAB)**

Course Code: **EEE352**

**L**    **T**    **P**    **C**  
**0**    **0**    **4**    **2**

**List of Experiments**

**Note: Minimum ten experiments should be performed from the following**

1. Measurement of displacement using LVDT.
2. Measurement of displacement using strain gauge based displacement transducer.
3. Measurement of displacement using magnetic pickup.
4. Measurement of load using strain gauge based load cell.
5. Measurement of water level using strain gauge based water level transducer
6. Measurement of flow rate by anemometer
7. Measurement of temperature by RTD.
8. Measurement of temperature by thermocouple
9. Study of P,PI and PID controllers
10. Study of storage oscilloscope and determination of transient response of RLC circuit.
11. Determination of characteristics of a solid state sensor/fibre-optic sensor
12. Design and test a signal conditioning circuit for any transducer
13. Study of data acquisition system using “lab view” software and test all signal points
14. Measurement of sine, triangular, square wave signal of function generator and verify its frequency at 100 Hz tap point using “labview” software.
15. Measurement of voltage and current signal of programmable power supply using

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech Semester III**  
**COMPUTER PROGRAMMING (LAB)**

Course Code: ECS353

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

**Write programs in C/C++ for**

1. Program illustrating overloading of various operators.
2. Program illustrating use of Friend, Inline, Static Member functions, default arguments.
3. Program illustrating use of destructor and various types of constructor.
4. Program illustrating various forms of Inheritance.
5. Program illustrating use of virtual functions, virtual Base Class.
6. Program illustrating how exception handling is done.
7. Program implementing various kinds of sorting algorithms, Search algorithms & Graph algorithms.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech. Semester III**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE371**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)

## B. Tech Semester IV SIGNAL AND SYSTEMS

Course Code: EEC401

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective of this course is to study the techniques and mathematical expressions of signals & system and applications thereof.

### Course Contents

#### Unit I

**Signals:** Definition, types of signals and their representations: continuous-time/discrete-time, periodic/non-periodic, even/odd, energy/power, deterministic/ random, one-dimensional/multi-dimensional; commonly used signals (in continuous-time as well as in discrete-time): unit impulse, unit step, unit ramp (and their inter-relationships), exponential, rectangular pulse, sinusoidal; operations on continuous-time and discrete-time signals (including transformations of independent variables).

**(Lectures 08)**

#### Unit II

**Laplace-Transform (LT) and Z-transform (ZT):** One-sided LT of some common signals, important theorems and properties of LT, inverse LT, solutions of differential equations using LT, Bilateral LT, Regions of convergence (ROC)

(i) One sided and Bilateral Z-transforms, ZT of some common signals, ROC, Properties and theorems, solution of difference equations using one-sided ZT, s- to z-plane mapping.

**(Lectures 08)**

#### Unit III

**Fourier Transforms (FT):** Definition, conditions of existence of FT, properties, magnitude and phase spectra, Some important FT theorems, Parseval's theorem, Inverse FT, relation between LT and FT

(i) Discrete time Fourier transform (DTFT), inverse DTFT, convergence, properties and theorems, Comparison between continuous time FT and DTFT.

**(Lectures 08)**

#### Unit IV

**Systems:** Classification, linearity, time-invariance and causality, impulse response, characterization of linear time-invariant (LTI) systems, unit sample response, convolution summation, step response of discrete time systems, stability.

convolution integral, co-relations, signal energy and energy spectral density, signal power and power spectral density, properties of power spectral density.

**(Lectures 08)**

#### Unit V

**Time and frequency domain analysis of systems:** Analysis of first order and second order systems, continuous-time (CT) system analysis using LT, system functions of CT systems, poles and zeros, block diagram representations; discrete-time system functions, block diagram representation, illustration of the concepts of system bandwidth and rise time through the analysis of a first order CT low pass filter

**(Lectures 08)**

### Text Book

1. Ramakrishna P. Rao, *Signal and Systems*, Tata McGraw Hill, New Delhi

### Reference Books

1. Chi-Tsong Chen, *Signals and Systems*, Oxford University Press, 2004

2. Oppenheim V. & Willsky A.S. & Hamid Nawab S., *Signals & System*, Pearson Education.



**B. Tech Semester IV**  
**NETWORK ANALYSIS AND SYNTHESIS**

**Course Code: EEC402**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The basic objective to study this subject to gain knowledge about network theorems, functions filters etc.

**Course Contents**

**Unit I**

**Graph Theory:** Graph of a Network, definitions, tree, co tree, link, basic loop and basic cut set, Incidence matrix, cut set matrix, Tie set matrix Duality, Loop and Node methods of analysis.

**(Lectures 08)**

**Unit II**

**Network Theorems (Applications to ac networks):** Super-position theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, Reciprocity theorem. Millman's theorem, compensation theorem, Tellegen's theorem.

**(Lectures 08)**

**Unit III**

**Network Functions:** Concept of Complex frequency, Transform Impedances Network functions of one port and two port networks, concept of poles and zeros, properties of driving point and transfer functions, time response and stability from pole zero plot, frequency response and Bode plots.

**(Lectures 08)**

**Unit IV**

**Two Port Networks:** Characterization of LTI two port networks ZY, ABCD and h parameters, reciprocity and symmetry. Inter-relationships between the parameters, inter-connections of two port networks, Ladder and Lattice networks. T & Representation.

**(Lectures 08)**

**Unit V**

**Network Synthesis:** Positive real function; definition and properties; properties of LC, RC and RL driving point functions, synthesis of LC, RC and RL driving point immittance functions using Foster and Cauer first and second forms.

**Filters:** Image parameters and characteristics impedance, passive and active filter fundamentals, low pass, high pass, band pass, band elimination filters.

**(Lectures 08)**

**Text Books**

1. Valkenburg M.E., Van, *Network Analysis*, Prentice Hall of India
2. Choudhary D.Roy, *Networks and Systems*, Wiley Eastern Ltd.
3. Donald E. Scott, *An Introduction to Circuit analysis: A System Approach*, McGraw
4. Chakrabarti A., *Circuit Theory*, Dhanpat Rai & Co.

**Reference Books**

1. Van M.E., *An Introduction to Modern Network Synthesis*, Wiley Eastern Ltd.
2. Hayt W.H. & Kemmerly Jack E., *Engineering Circuit Analysis*, Tata McGraw Hill.
3. Gupta Soni., *Circuit Analysis*, Dhanpat Rai & Sons.

## B. Tech- Semester IV ELECTRONIC DEVICES AND CIRCUITS

Course Code: EEC404

L	T	P	C
3	2	0	4

**Objective:** The objective behind this subject is to know about electronic devices like diodes, LED, LCD, JFET, MOSFET etc.

### Course Contents

#### Unit I

**Electron Dynamics and Properties:** Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT deflection sensitivity (Electrostatic and magnetic deflection), Parallel Electric and Magnetic fields, Perpendicular Electric and Magnetic fields (Lectures 08)

#### Unit II

**Junction diode characteristics:** Review of semi conductor Physics – n and p –type semi conductors, Mass Action Law, Continuity Equation, Hall Effect, Fermi level in intrinsic and extrinsic semiconductors, Open-circuited p-n junction, The p-n junction Energy band diagram of PN diode, PN diode as a rectifier (forward bias and reverse bias), The current components in p-n diode, Law of junction, Diode equation, Volt-ampere characteristics of p-n diode, Temperature dependence of VI characteristic, Transition and Diffusion capacitances, Step graded junction, Breakdown Mechanisms in Semi Conductor (Avalanche and Zener breakdown) Diodes, Zener diode characteristics, Characteristics of Tunnel Diode with the help of energy band diagrams, Varactor Diode, LED, LCD. And photo diode. (Lectures 08)

#### Unit III

**Rectifiers, filters and regulators:** Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter, P- section filter Multiple L-section and Multiple Psection filter, and comparison of various filter circuits? In terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators (Lectures 08)

#### Unit IV

**Transistor and fit Characteristics:** Junction transistor, Transistor current components, Transistor as an amplifier, Transistor construction, Detailed study of currents in a transistor, Transistor alpha, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations, Relation between Alpha and Beta, typical transistor junction voltage values, JFET characteristics (Qualitative and Quantitative discussion), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Comparison of Transistors, Introduction to SCR and UJT. (Lectures 08)

#### Unit V

**Amplifiers:** Small signal low frequency transistor amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of  $A_i$ ,  $R_i$ ,  $A_v$ ,  $R_o$ ,  
**FEEDBACK AMPLIFIERS:** Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on input and output characteristics, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis

**Oscillators:** Condition for oscillations. RC-phase shift oscillators with Transistor and FET, Hartley and Colpitts oscillators, Wein bridge oscillator, Crystal oscillators, Frequency and amplitude stability of oscillators. (Lectures 08)

#### Text Books

1. Millman J., C.C.Halkias & Satyabratha Jit, *Electronic Devices and Circuits*, Tata McGraw Hill.
2. Boylestad R.L. & Louis Nashelsky, *Electronic Devices and Circuits*, Pearson, Prentice Hall.

#### Reference Books

1. Bogart T.F., Jr., J.S.Beasley & G.Rico, *Electronic Devices and Circuits*, Pearson Education.
2. Burns S.G. & P.R.Bond, *Principles of Electronic Circuits*, Galgotia Publications, 1998.
3. Millman & Grabel, *Microelectronics*, Tata McGraw Hill, 1988.
4. Lal Kishore K., *Electronic Devices and Circuits*, B.S. Publications, 2005.

**B. Tech Semester IV**  
**ANALOG COMMUNICATION SYSTEM**

**Course Code: EEC405**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to know about various techniques useful in analog communication and its application thereof.

**Course Contents**

**Unit I**

Introduction and Review of Signals and Systems Introduction to the course. Communication system, modulation, analog vs. digital communication systems. Review of Fourier transform, linear systems, filters, etc. **(Lectures 08)**

**Unit II**

Analog Communication Systems Amplitude modulation (AM) and its variants, frequency-division multiplexing (FDM), angle modulation (FM and PM), phased-locked loop, superheterodyne receiver. Application to broadcast radio and television. Overview of noise effects in AM and FM systems. **(Lectures 08)**

**Unit III**

Digital Communication Systems Sampling, pulse-amplitude modulation, time-division multiplexing (TDM), quantization, pulse-code modulation (PCM), speech coding. (transmission of baseband pulses): matched filter, intersymbol interference, channel equalization, adaptive equalizer. **(Lectures 08)**

**Unit IV**

Digital passband transmission and reception, coherent phase-shift keying (PSK) and frequency-shift keying (FSK) and quadriphase-shift keying (QPSK), noncoherent FSK, quadrature amplitude modulation (QAM). Applications to digital cellular phones and high-speed modems. **(Lectures 08)**

**Unit V**

Introduction to spread-spectrum modulation, frequency-hopping and direct sequence, code-division multiplexing (CDM). Application to CDMA wireless communication systems. **(Lectures 08)**

**Text Books**

1. Haykin Simon John, *Communication Systems*, Wiley & Sons
2. Kennedy G.& B. Davis, *Electronic Communication Systems*, Tata McGraw Hill
3. Haykin Simon, *Digital Communications*, John Wiley & Sons

**Reference Books**

1. Lathi B.P., *Modern Analog & Digital Communication Systems*, Oxford University Press.
2. Taub & Schilling, *Communication System: Analog and Digital*, Tata Mc Graw Hill
3. Singh R.P. & S.D. Sapre, *Communication Systems Analog and Digital*, Tata McGraw Hill.

## B. Tech- Semester IV MATHEMATICS –III

Course Code: EAS401

L	T	P	C
3	2	0	4

**Objective:** The basic objective to study statistical & numerical techniques and its application to engineering.

### Course Contents

#### Unit I

**Function of Complex variable:** Analytic function, C-R equations, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic function, Taylor's and Laurent's series, singularities, Residue theorem, Evaluation of real integrals of the type and 10. **(Lectures 08)**

#### Unit II

**Statistical Techniques – I:** Moments, Moment generating functions, Skewness, Kurtosis, Curve fitting, Method of least squares, Fitting of straight lines, Polynomials, Exponential curves etc., Correlation, Linear, non-linear and multiple regression analysis, Probability theory. **(Lectures 08)**

#### Unit III

**Statistical Techniques – II:** Binomial, Poisson and Normal distributions, Sampling theory (small and large), Tests of significations: Chisquare test, t-test, Analysis of variance (one way) , Application to engineering, medicine, agriculture etc. Time series and forecasting (moving and semi-averages), Statistical quality control methods, Control charts, R, p, np, and c charts. **(Lectures 08)**

#### Unit IV

**Numerical Techniques – I:** Zeroes of transcendental and polynomial equation using Bisection method, Regula-falsi method and Newton-Raphson method, Rate of convergence of above methods. Interpolation: Finite differences, difference tables, Newton's forward and backward interpolation , Lagrange's and Newton's divided difference formula for unequal intervals. **(Lectures 08)**

#### Unit V

**Numerical Techniques –II:** Solution of system of linear equations, Gauss- Seidal method, Crout method. Numerical differentiation, Numerical integration , Trapezoidal , Simpson's one third and three-eight rules, Solution of ordinary differential (first order, second order and simultaneous) equations by Euler's, Picard's and forth-order Runge-Kutta methods. **(Lectures 08)**

### Test Books

1. Peter V. O'Neil, *Advance Engineering Mathematics Thomson (Cenage) Learning*, 2007.
2. Jain, Iyenger & Jain, *Numerical Methods for Scientific and Engineering Computation*, New Age International, New Delhi, 2003.
3. Kapur J.N., *Mathematical Statistics*, S. Chand & Company Ltd.,2000

### Reference Books

1. Jain R.K. & S.R.K. Iyenger, *Advance Engineering Mathematics*, Narosa Publication House, 2002.
2. Chandrika Prasad, *Advanced Mathematics for Engineers*, Prasad Mudralaya, 1996.
3. Kreysig E., *Advanced Engineering Mathematics*, John Wiley & Sons, 2005.
4. Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers, 2005.
5. Prasad Devi, *An introduction to Numerical Analysis*, Narosa Publication house, New Delhi 2006.
6. Veerajan T. & T. Ramchandrandran, *Theory & Problems in Numerical Methods*, TMH, New Delhi, 2004.
7. Gupta S.P., *Statistical Methods*, Sultan and Sons, New Delhi, 2004.
8. Devore, *Probability and Statistics*, Thomson (Cengage) Learning, 2007.

**B. Tech. Semester IV**  
**ENGLISH COMMUNICATION-IV**

**Course Code: EHM401**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Course Contents**

**Unit I**

Communication: Meaning and importance of communication, Essentials of an effective communication, Barriers to effective communication, Channels of communication.

**(Lectures 06)**

**Unit II**

Types of Communication: Written and Verbal communication, Formal and Informal communication (the Grapevine), Upward and Downward communication; Formal and Informal network models.

**(Lectures 06)**

**Unit III**

Advantages and Disadvantages Communication (conversational)-Telephonic conversation, Guidelines for telephonic conversation, How to receive a call, telephone message, How to make a call, emergency calls.

**(Lectures 06)**

**Unit IV**

Writing Skills Summarizing. Reporting events, writing newspaper reports Essential of essay writing-writing an essay of about 300 words on a given topic.

**(Lectures 06)**

**Unit V**

Value Based Reading

Short Stories: "The Fly", Katherine Mansfield

"The Eyes Are Not Here", Ruskin Bond

Essay: "The Gandhian Outlook", Dr.S.Radhakrishnan

**(Lectures06)**

**Texts Books**

1. Singh R.P, *An Anthology of English Essays*, Oxford University Press, New Delhi.
2. Singh R P, *An Anthology short stories*, Singh R P, OUP, New Delhi.
3. Ruther Ford A., *Basic Communication Skills*, Person Education, New Delhi.

**Reference Books**

1. Arora V.N. et al, *Improve Your Writing*, OUP, Delhi.
2. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi.

**\*Note:**

**Internal Marking**

There shall be a continuous evaluation and the marking would be as follows.

**Marks 50**

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks-** Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

**B. Tech Semester IV**  
**NETWORK ANALYSIS & SYNTHESIS (LAB)**

Course Code: EEC451

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

Note: Minimum eight experiments are to be performed from the following list.

1. Verification of principle of superposition with dc and ac sources.
2. Verification of Thevenin, Norton and Maximum power transfer theorems in ac circuits
3. Verification of Tellegen's theorem for two networks of the same topology
4. Determination of transient response of current in RL and RC circuits with step voltage input critically damp and overdamp cases
5. Determination of frequency response of current in RLC circuit with sinusoidal ac input parameters theoretical values.
6. S.C. tests Write Demo for the following (in Ms-Power point) also study loading effect in cascade.
7. Determination of frequency response of a Twin – T notch filter.
8. To determine attenuation characteristics of a low pass/high pass active filters.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech Semester IV**  
**ELECTRONIC DEVICES & CIRCUITS (LAB)**

Course Code: EEC452

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

Note: Select any 10 out of the following:

1. **Study of lab equipments and components:** CRO, Multimeter, Function Generator, Power supply- Active, Passive Components & Bread Board.
2. **Properties of junctions** Zener diode characteristics. Heavy doping alters the reverse characteristics. Graphical measurement of forward and reverse resistance.
3. **Characteristic of BJT:** BJT in CB and CE configuration- Graphical measurement of h parameters from input and output characteristics. Measurement of  $A_v$ ,  $A_i$ ,  $R_o$  and  $R_i$  of CE amplifier with potential divider biasing.
4. **Characteristic of FET:** FET in common source configuration. Graphical measurement of its parameters gm, rd & m from input and output characteristics.
5. **Applications of Op-amp-** Op-amp as summing amplifier, Difference amplifier, Integrator and differentiator
6. **Field Effect Transistors-**Single stage Common source FET amplifier –plot of gain in dB Vs frequency, measurement of, bandwidth, input impedance, maximum signal handling capacity (MSHC) of an amplifier
7. **Bipolar Transistors-** Design of single stage RC coupled amplifier –design of DC biasing circuit using potential divider arrangement –Plot of frequency Vs gain in dB. Measurement of bandwidth of an amplifier, input impedance and Maximum Signal Handling Capacity of an amplifier.
8. **Two stage Amplifier.** Plot of frequency Vs gain. Estimation of Q factor, bandwidth of an amplifier
9. **Common Collector Configuration-Emitter Follower** (using Darlington pair)-Gain and input impedance measurement of the circuit.
10. **Power Amplifiers-**Push pull amplifier in class B mode of operation –measurement of gain.
11. **Differential Amplifier** –Implementation of transistor differential amplifier .Non ideal characteristics of differential amplifier
12. **Oscillators** -Sinusoidal Oscillators- (a) Wein bridge oscillator (b) phase shift oscillator
13. **Simulation of Amplifier** circuits studied in the lab using any available simulation software and measurement of bandwidth and other parameters with the help of simulation software.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ (5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL (50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech Semester IV**  
**ANALOG COMMUNICATION SYSTEMS (LAB)**

Course Code: EEC453

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

1. To study Amplitude modulation using transistor and determine depth of modulation.
2. To develop detector for demodulation of AM signal and observe diagonal peak clipping effect.
3. Frequency modulation using voltage controlled oscillator.
4. Generation of DSB- SC signal using balanced modulator.
5. Generation of side band signal.
6. Study of phase lock loop and detection of FM signal using PLL.
7. Measurement of noise figure using a noise generator.
8. Study of super heterodyne AM receiver and measurement of sensitivity, selectivity and fidelity.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ (5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL (50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination



**B. Tech. Semester IV**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE471**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)

## B. Tech Semester V CONTROL SYSTEM

Course Code: EEE501

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective to study this subject is to know about open and closed systems about synchronous, servo motors design of networks etc.

### Course Contents

#### Unit I

**The Control System:** Open loop & closed control; servomechanism, Physical examples. Transfer functions, Block diagram algebra, Signal flow graph, Mason's gain formula Reduction of parameter variation and effects of disturbance by using negative feedback.

(Lectures 08)

#### Unit II

**Time Response analysis:** Standard test signals, time response of first and second order systems, time response specifications, steady state errors and error constants. Design specifications of second order systems: Derivative error, derivative output, integral error and PID compensations, design considerations for higher order systems, performance indices.

(Lectures 08)

#### Unit III

**Control System Components:** Constructional and working concept of ac servomotor, synchros and stepper motor. Stability an Algebraic Criteria concept of stability and necessary conditions, Routh-Hurwitz criteria and limitations Root Locus Technique: The root locus concepts, construction of root loci.

(Lectures 08)

#### Unit IV

**Frequency response Analysis:** Frequency response, correlation between time and frequency responses, polar and inverse polar plots, Bode plots. Stability in Frequency Domain: Nyquist stability criterion, assessment of relative stability: gain margin and phase margin, constant M&N circles.

(Lectures 08)

#### Unit V

**Introduction to Design:** The design problem and preliminary considerations lead, lag and lead-lag networks, design of closed loop systems using compensation techniques in time domain and frequency domain.

**Review of state variable technique:** Review of state variable technique, conversion of state variable model to transfer function model and vice-versa, diagonalization, Controllability and observability and their testing.

(Lectures 08)

#### Text Book:

1. Nagrath & Gopal, *Control System Engineering*, New age International.
2. Ogata K., *Modern Control Engineering*, Prentice Hall of India.

#### Reference Books:

1. Mise Norman S., *Control System Engineering*, Wiley Publishing Co.
2. Gopal M., *Control System; Principle and Design*, Tata McGraw Hill.
3. Gopal M., *Modern Control System*, Tata McGraw Hill.
4. Choudhary D.Roy, *Modern Control Engineering*, Prentice Hall of India.

## B. Tech Semester V MICROPROCESSORS & APPLICATIONS

Course Code: EEC501

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective to understand microprocessors, assembly language and engineering applications thereof.

### Course Contents

#### Unit I

**Introduction to Microprocessor:** 8085 Evolution of Microprocessor, Register Structure, ALU, Bus Organization, Timing and Control, instruction set. Architecture of 16-bit Microprocessors: Architecture of 8086; (Bus Interface Unit, Execution unit) Register Organization, Bus operation, Memory segmentation.

(Lectures 08)

#### Unit II

**Assembly Language Programming:** Addressing Modes and instruction set of 8086, Arithmetic and Logic instructions, Program Control Instructions (jumps, conditional jumps, subroutine call) Loop and string instructions, Assembler Directives.

(Lectures 08)

#### Unit III

**CPU Module:** Signal Description of pins of 8086 and 8088, Clock generator, Address and Data bus Demultiplexing, Buffering Memory Organization, Read and Write cycle Timings, Interrupt Structures, Minimum Mode, and Maximum Mode Operation.

(Lectures 08)

#### Unit IV

**Peripheral Interfacing:** Programmed I/O, Interrupt Driven, I/O, DMA, Parallel I/O, (8255-PPI, Parallel port), 8253/8254 programmable Timer/Counter Interfacing with ADC.

(Lectures 08)

#### Unit V

Peripheral Interfacing (Contd.): 8259 Programmable Interrupt controller, 8237 DMA controller Concept of Advanced 32 bit Microprocessors: Pentium Processor.

(Lectures 08)

#### Text Books

1. Gaonkar Ramesh S., *Microprocessor Architecture, Programming, and Applications with the 8085*, Pen Ram International Publishing.
2. Ray A.K. & Burchandi, K.M., *Advanced Microprocessors and Peripherals: Architecture Programming and Interfacing*, Tata McGraw Hill.
3. Hall D.V., *Microprocessors Interfacing*, Tata McGraw Hill.
4. Singh B.P. & Renu Singh, *Microprocessors and Microcontrollers*, New Age International.

#### Reference Books

1. Liu & Gibson G.A., *Microcomputer Systems: The 8086/8088 Family*, Prentice Hall (India).
2. Brey, Barry B., *INTEL Microprocessors*, Prentice Hall (India).
3. Ram B., *Advanced Microprocessor & Interfacing*, Tata McGraw Hill.
4. Singh Renu & Singh B.P., *Microprocessors and Interfacing & Applications*, New Age International.

## B. Tech Semester V MICROWAVE ENGINEERING

Course Code: EEC502

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective to understand microwave, and engineering applications thereof.

### Course Contents

#### Unit I

**Transmission Lines:** Basic principles, Structures and Properties of Transmission Lines. Scattering Parameters and Circuit Analysis, Uncertainty and Confidence in measurements, Using Coaxial Connectors in Measurement.

(Lectures 08)

#### Unit II

**Attenuation Measurement:** Basic principles, Measurement systems, important considerations when making attenuation measurements.

(Lectures 08)

#### Unit III

**RF Voltage Measurement:** RF voltage measuring instruments, impedance matching and mismatch errors.

**RF Power Measurement:** Power sensors, power measurements and calibration, calibration and transfer standards, power splitters, couplers and reflect meters.

(Lectures 08)

#### Unit IV

**Noise Measurements:** Types of noise, types of noise source, measuring noise, measurement accuracy, mismatch effects, automated noise measurements.

(Lectures 08)

#### Unit V

**Network Analyzers:** Spectrum Analyzer Measurements and Applications. Elements of network analyser, MMIC measurement techniques, calibration and verification of automatic network analysers, spectrum analyser basic principle, applications of spectrum analyzer.

(Lectures 08)

#### Text Book

1. Liao, S.Y., *Microwave Devices & Circuits*, PHI .
2. Skolnik M.I., *Introduction to Radar Engineering*; THM

#### Reference Book

1. Collin, R.E., *Foundations for Microwave Engineering*; TMH .
2. Rizzi, *Microwave Engineering: Passive Circuits*, PHI.
3. Das A. & Das S.K., *Microwave Engineering*, TMH.
4. Pozar ,*Microwave Engineering* , John Wiley

**B. Tech Semester V**  
**LINEAR INTEGRATED CIRCUITS**

**Course Code: EEC503**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective to study behind this subject is to know about the circuits, transistors, amplifiers, etc.

**Course Contents**

**Unit I**

BJT differential amplifier analysis - concept of CMRR - methods to improve CMRR - constant current source - active load - current mirror - Darlington pair - differential input impedance - various stages of an operational amplifier - simplified schematic circuit of opamp 741 - need for compensation - lead, lag and lead lag compensation schemes - typical opamp parameters - slew rate - power supply rejection ratio - open loop gain - unity gain bandwidth - offset current & offset voltage.

**(Lectures 08)**

**Unit II**

MOS differential amplifier – current mirrors - current source load and cascode loads – wide swing constant transconductance differential amplifier - CMOS opamp with and without compensation - cascode input opamp - typical CMOS opamp parameters.

**(Lectures 08)**

**Unit III**

Linear opamp circuits - inverting and noninverting configurations - analysis for closed loop gain - input and output impedances - virtual short concept - current to voltage and voltage to current converters - instrumentation amplifier - nonlinear opamp circuits - log and antilog amplifiers - 4 quadrant multipliers and dividers - phase shift and wein bridge oscillators - comparators - astable and monostable circuits - linear sweep circuits.

**(Lectures 08)**

**Unit IV**

Butterworth approximation to ideal low pass filter characteristics – features of Chebychev and Bessel approximations - frequency transformations to obtain HPF, BPF and BEF from normalized prototype LPF – Realization of LPF & HPF using Sallen-Key configuration – BPF realization using the Delyannis configuration - BEF using twin T configuration - all pass filter (first & second orders) realizations - inductance simulation using Antoniou's gyrator.

**(Lectures 08)**

**Text Books**

1. Jacob Baker R., Li H.W. & Boyce D.E., *CMOS, Circuit Design, Layout & Simulation*, PHI
2. Sergio Franco, *Design with Operational Amplifiers and Analog Integrated Circuits*, McGraw Hill Book Company
3. Fiore J.M., *Operational Amplifiers and Linear Integrated Circuits*, Jaico Publishing House

**Reference Books**

1. Gobind Daryanani, *Principles of Active Network Synthesis & Design*, John Wiley
2. Sedra A.S. & Smith K.C., *Microelectronic Circuits*, Oxford University Press
3. Coughlin R.F. & Driscoll F.F., *Operational Amplifiers and Linear Integrated Circuits*, Pearson Education
4. Horenstein M.N., *Microelectronic Circuits & Devices*, PHI
5. Gaykward, *Operational Amplifiers*, Pearson Education

**B. Tech Semester V**  
**DIGITAL COMMUNICATION SYSTEM**

Course Code: EEC504

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** the objective behind this subject is to get knowledge about modulation & coding.

**Course Contents**

**Unit I**

**Pulse Digital Modulation:** Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error, compacting in PCM systems. Differential PCM systems (DPCM).

(Lectures 08)

**Unit II**

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

(Lectures 08)

**Unit III**

**Digital Modulation Techniques:** Introduction, ASK, FSK, PSK, DPSK, DEPSK, QPSK, M-ary PSK, ASK, FSK, similarity of BFSK and BPSK.

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

(Lectures 08)

**Unit IV**

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

(Lectures 08)

**Unit V**

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

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

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

(Lectures 08)

**Text Books**

1. Haykin Simon, *Digital Communications*, John Wiley, 2005
2. Taub H. & Schilling D., *Principles of Communication Systems*, TMH, 2003

**Reference Books**

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

## B. Tech. – Semester V ENGLISH COMMUNICATION-V

Course Code: EHM501

L	T	P	C
3	0	0	3

**Objective:** The fundamental objective of this course is to improve the Communicational as well as written skills of students.

### Course Contents

#### Unit I

**Letter Writing:** Informal and Formal letters, Writing Invitations, Letter of acceptance, declining the invitations, Letter-writing skills, Process of letter Writing, Forms, Structure, Style and tone. Letter written to the Editor of a Newspaper.

(Lectures 06)

#### Unit II

**Official Letters:** Essentials for good official correspondence, Different types of official correspondence and their drafting, Drafting D.O.letters, Semi official letters, circulars, Memos, Government Letters, Letters to authorities.

(Lectures 06)

#### Unit III

**Business Communication:** Essentials of good commercial correspondence, components of commercial correspondence, Different types of commercial correspondence and their drafting, Letter of enquiring, Letter of sales, Letter of Credit, Collection of money, order, Complaint, claim and adjustment letter, Letters to insurance companies, banks, etc.

(Lectures 06)

#### Unit IV

Bio-data Making, Resumes, Writing Job Applications.

(Lectures 06)

#### Unit V

Value Based Reading

**Essays:** “A Bookish Topic”, R.K.Narayan

“Of Studies”, Francis Bacon

“The Civilization of Today”, CEM Joad

(Lectures 06)

### Texts Books

1. Singh R.P, *An Anthology of English Essays*, Oxford University Press, New Delhi.
2. Ruther Ford A., *Basic Communication Skills*, Person Education, New Delhi.

### Reference Books

1. Arora V.N. et al, *Improve Your Writing*, OUP, Delhi.
2. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi.

### \*Note:

### Internal Marking

There shall be a continuous evaluation and the marking would be as follows.

### Marks 50

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks-** Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

**B. Tech Semester V  
CONTROL SYSTEM (LAB)**

Course Code: EEE551

**L     T     P     C**  
**0     0     4     2**

**List of Experiments**

**Note: The minimum of 10 experiments are to be performed from the following, out of which at least three should be software based.**

1. To determine response of first order and second order systems for step input for various values of constant 'K' using linear simulator unit and compare theoretical and practical results.
2. To study P, PI and PID temperature controller for an oven and compare their performance.
3. To study and calibrate temperature using resistance temperature detector (RTD)
4. To design Lag, Lead and Lag-Lead compensators using Bode plot.
5. To study DC position control system
6. To study synchro-transmitter and receiver and obtain output V/S input characteristics
7. To determine speed-torque characteristics of an ac servomotor.
8. To study performance of servo voltage stabilizer at various loads using load bank.
9. To study behaviour of separately excited dc motor in open loop and closed loop conditions at various loads.
10. To study PID Controller for simulation proves like transportation lag.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ ( 5MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL ( 50 MARKS)
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination



## **B. Tech Semester V MICROWAVE ENGINEERING (LAB)**

**Course Code: EEC551**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### **List of Experiments**

1. Measurement of guide wavelength and frequency of the signal in a rectangular waveguide.
2. Measurement of VSWR using slotted line.
3. Study of mode characteristics of reflex Klystron and determination of mode number, transit time & electronic tuning sensitivity.
4. Study of characteristics of Gunn oscillator.
5. Study of Gunn diode as modulated source (PIN modulation) and determination of modulation depth.
6. Measurement of coupling coefficient and directivity of a directional coupler.
7. Study of insulation & coupling coefficient of a magic T.
8. Measurement of attenuation using substitution method and plot of attenuation versus frequency characteristics.
9. Study of waveguide horn and its radiation pattern and determination of the beam width.
10. Study of a ferrite circulator and measurement of isolation, insertion loss, cross coupling and input VSWR.
11. Measurement of microwave power using power meter.

### **Evaluation of Practical Examination:**

#### **Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

### **Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ (5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL (50 MARKS)</b>
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#### **External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

## **B. Tech Semester V**

### **DIGITAL COMMUNICATION SYSTEMS (LAB)**

**Course Code: EEC552**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

#### **List of Experiments**

1. Study of Sampling and reconstruction techniques.
2. Study of Pulse code modulation and demodulation.
3. Study of delta modulation and demodulation and observe effect of slope overload DCL-07
4. Study of Adaptive Delta modulation and demodulation
5. Study of data coding techniques.
6. Study of amplitude shift keying modulator and demodulator.
7. Study of frequency shift keying modulator and demodulator.
8. Study of phase shift keying modulator and demodulator.
9. Study of TDM PCM Transmitter and receiver.

#### **Evaluation of Practical Examination:**

##### **Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

#### **Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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##### **External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech. - Semester V**  
**INDUSTRIAL TRAINING**  
**(PRESENTATION BASED ON INDUSTRIAL TRAINING DONE AFTER THE**  
**IV SEMESTER EXAMINATION IN SUMMER)**

**Course Code: EEC591**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>

**Guidelines**

Students will go for Industrial training of four weeks in any industry or reputed organization after the IV semester examination in summer. The evaluation of this training shall be included in the V semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the IV semester and shall be the nodal point for coordination of the training.

Students will also be required to prepare an exhaustive technical report of the training during the V semester which will be duly signed by the officer under whom training was taken in the industry/ organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Director of the college.

The student at the end of the V semester will present his report about the training before a committee constituted by the Director of the College which would comprise of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately to the Director in a sealed envelope.

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

**Internal: 100 marks**

By the Faculty Guide - 50 marks

By Committee appointed by the Director – 50 marks

**External: 100 marks**

By Officer-in-charge trainee in industry – 50 marks

By External examiner appointed by the University – 50 marks

**B. Tech. –Semester V**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE571**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)

## B. Tech. Semester VI NEURAL NETWORKS

Course Code: EEC601

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The object behind this subject is to know about networking system, control information & algorithms.

### Course Contents

#### Unit I

**Introduction to Neural Network:** Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN. (Lectures 08)

#### Unit II

**Essentials of Artificial Neural Networks:** Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules. (Lectures 08)

#### Unit III

**Single Layer Feed Forward Neural Networks:** Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Limitations of the Perceptron Model.

(Lectures 08)

#### Unit IV

**Multilayer Feed forward Neural Networks:** Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements. (Lectures 08)

#### Unit V

**Associative Memorie:** Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function. Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis.

(Lectures 08)

### Text Books

1. Rajasekharan S. & Vijayalakshmi G. A., *Neural Networks, Fuzzy logic, Genetic Algorithms: Synthesis and Applications*, PHI Publication, 2004.
2. John Yen and Reza Langan, *Fuzzy Logic: Intelligence, Control and Information*, Pearson Education, 2004.

### Reference Books

1. Simon Haykin, *Neural Networks- A Comprehensive Foundation*, Pearson Education, 2001.
2. Sivanandam S.N. Sumathi S., *Introduction to Neural Networks using MATLAB 6.0*, TMH, 2006.
3. James A Freeman & Davis Skapura, *Neural Networks Pearson Education*, 2002.
4. Timothy J. Ross, *Fuzzy Logic With Engineering Applications*, McGraw-Hill Inc. 1997

**B. Tech. Semester VI**  
**ANTENNA & WAVE PROPAGATION**

**Course Code: EEC602**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The object behind this subject is to know about different types of antenna and their role in wave propagation.

**Course Contents**

**Unit I**

**Antenna Principles:** Potential Functions & Electromagnetic Field, Current Elements, Radiation from Monopole & Wave Dipole Network Theorems, Directional Properties of Dipole Antenna Antenna gain, effective area, antenna Terminal impedance, antenna as an opened out Transmission Line, Practical Antennas and Methods of Excitation, Transmission Loss between Antennas, Antenna Temperature and Signal to Noise Ratio. **(Lectures 08)**

**Unit II**

**Antennas Arrays:** Two Element Array, Horizontal Patterns in Broadcast Arrays, Linear Arrays, Binomial Array Tchebyscheyff Distribution. **(Lectures 08)**

**Unit III**

**Wave Propagation:** Modes of Propagation, Plane Earth Reflection, Space wave and Surface Wave, Elevated Dipole Antennas above a Plane Earth, Wave Tilt of the Surface Wave, Spherical Earth Propagation. Tropospheric Wave. Ionosphere Propagation, Sky Wave Transmission Calculations, Effects of the Earth's Magnetic Field, Wave Propagation in the Ionosphere, Virtual Height, MUF/LUF, Skip Distance, Duct Propagation, Space wave. **(Lectures 08)**

**Unit IV**

**Wave Guides:** Rectangular, Circular, Transmission Line Analogy for Wave guides, Dielectric Slab Wave guide. **(Lectures 08)**

**Unit V**

**Microwave Generation:** Conventional Vacuum Tubes, Klystrons; Reflex & Multicavity, TWT, Magnetrons, FWCFA, BWCFA & BWO, IMPATT, Parametric Devices, Gunn, InP, CdTe Diodes.

**(Lectures 08)**

**Text Books**

1. Jordan Edwards C. & Balmain Keith G., *Electromagnetic Waves and Radiating Systems*, Prentice Hall of India.
2. Liao S.Y., *Microwave Devices & Circuits*, Prentice Hall of India.

**Reference Books**

1. Kraus, John D. & Mashefka, Ronald J., *Antennas: for All Applications*, Tata McGraw Hill,
2. Prasad, K.D., *Antennas and Wave Propagation*, Khanna Publications
3. Collin, R., *Antennas and Radio Wave Propagation*, Tata Mc Graw-Hill.
4. Hayt Jr. William H., *Engineering Electromagnetic*, Tata McGraw-Hill.
5. Das, Annaparna & Das, Sisir K, *Microwave Engineering*, Tata McGraw Hill.
6. Roy, Suresh Kumar & Mitra, Monojit, *Microwave Semiconductor Devices*, Prentice Hall of India.

**B. Tech.- Semester VI**  
**ANALOG INTEGRATED ELECTRONICS**

Course Code: EEC603

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to study analog integrated circuits, design and analysis method of analog circuits.

**Course Contents**

**Unit I**

**Frequency response & stability of an Op-Amp:** Frequency response, compensating Networks, Frequency response of internally compensated and uncompensated Op-Amps, High frequency Op-Amps. Equivalent circuit, stability in constant GBP Op-Amp. Circuits. **(Lectures 08)**

**Unit II**

**Op-Amp Circuits:** Linear Applications Current to voltage converters, V to I converters, current amplifier, difference Amplifiers, Instrumentation Amplifiers, Integrators & Differentiator. **(Lectures 08)**

**Unit III**

**Active filters & Converters:** First and second order low pass & High pass filters, Band Pass & Band-Reject filters, All-Pass filter, Filter using MATLAB. Voltage to Frequency and Frequency to voltage Converters, Analog to Digital and Digital to Analog Converters. **(Lectures 08)**

**Unit IV**

**Non Linear Circuits & Regulators:** Voltage Comparators, Schmitt Triggers, Precision Rectifiers, Analog Switches Peak detectors, sample and Hold circuit, square and Triangular Wave Generators, Linear Regulators Switching Regulators. **(Lectures 08)**

**Unit V**

**Non linear Amplifiers & Phase-Locked Loops:** Log/Antilog Amplifiers, Analog Multipliers, Operational Trans conductance Amplifiers (OTA), Phase-Locked Loops, Monolithic PLLs, Noise in Integrated Circuits. **(Lectures 08)**

**Text Books**

1. Sergio Franco, *Design with Operational Amplifiers and Analog Integrated Circuits*, Tata McGraw-Hill
2. Ramakant A. Gayakwad, *Op-Amps and Linear Integrated Circuits*, Prentice Hall of India.

**Reference Books**

1. M .Fiore James, *Op-Amps and Linear Integrated Circuits: Theory and Applications*, Thomson Asia Pvt. Ltd. Singapore
2. Millman J. & Halkias C.C., *Integrated Electronics Analog and Digital Circuits & Systems*, Mc Graw Hill.
3. Soclof, S., *Application of Analog Integrated Circuits*, Prentice Hall of India.
4. Bell David A., *Operational Amplifiers & Linear ICS*, Prentice Hall of India.

## B. Tech. Semester VI

### DESIGN OF ELECTRONICS SYSTEMS

Course Code: EEC604

L	T	P	C
3	2	0	4

**Objective:** The objective is to study various tools and techniques useful in designing electronic systems.

#### Course Contents

##### Unit I

**Design of Power Supplies:** Design of Unregulated power supply, selection of transformer, diodes, capacitors, calculation of surge resistance (using bridge rectifier) Design of Discrete series regulated power supply with protection circuit, design of regulated power supply using IC LM-340 series, design of Dual power supply using LM-317 and LM 337 IC's., Design of switching regulators, Buck regulator, Boost regulator, and Buck – Boost using switching regulator IC – LM 1577 / 2577. Heat sink calculations for power supplies. (Lectures 08)

##### Unit II

**Design of Small Signal (Voltage) Amplifier BJT/FET:** Design of Bias circuits (BJT/FET) Design of single stage amplifiers (CE/CS, CG/CB/CC/CD).

**Use of Negative Feedback:** Feedback amplifier design. Designing of negative feedback amplifiers: voltage series, voltage shunt, current series, current shunt. (Lectures 08)

##### Unit III

**Design of Large Signal (power) Amplifiers:** Class - A, class - B, Class - AB , Push-pull amplifier, complementary symmetry amplifiers , Monolithic power amplifier design using IC LM-379. (Lectures 08)

##### Unit IV

**Design of High Frequency Amplifier:** Design of Tuned amplifier BJT/FET single tuned, double tuned. Use of auto transformer (Tapped - inductor) High frequency, cascode amplifier.

**Design of Oscillator Circuits:** Clapp, Colpitt , Hartley oscillator, Design of switching circuits: Astable multivibrator, Monostable multivibrator, Bistable multivibrator. (Lectures 08)

##### Unit V

**Design using Analog Integrated Circuits:** Single supply amplifiers (AC inverting, AC Non inverting amplifiers), instrumentation amplifier AD – 620, V - I converter, I - V converter, V - F, F - V, converters. Current amplifiers.

**Design of Non-linear Circuits:** Voltage comparators, peak detectors, True RMS converter.

**Sallen-key active filter design:** Second order Sallen-key low pass, high pass, band pass, band reject, unity gain and equal component circuit design for Butterworth, Chebyshev response. Higher order filter design. (Lectures 08)

#### Text Books

1. Shah M.M., *Design of Electronics Circuits and Computer Aided Design*, Wiley Eastern
2. Goyal , Khetan, *Monograph on Electronics Design Principles*, Khanna Pub.

#### Reference Books

1. Jacob Michael, *Application and Design with Analog Integrated Circuits*, PHI
2. Franco Sergio, *Design with OP-AMP and Analog Integrated Circuits*, TMH .
3. Bell, *Electronics Devices and Circuits*, PHI .
4. Martin S Roden, Gordon, *Electronics Design*, Shroff Pub.
5. Bell, *Solid State Pulse Circuits*, PHI.
6. Ramanan K.V., *Functional Electronics*, TMH



**B. Tech. Semester VI**  
**TELECOMMUNICATION SWITCHING SYSTEMS**

**Course Code: EEC605**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective behind this subject is to know about telecommunication network which helpful in telecommunication system.

**Course Contents**

**Unit I**

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

**(Lectures 08)**

**Unit II**

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

**SIGNALING TECHNIQUES:** In channel signaling, common channel signaling. Network traffic load and parameters, grade of service and blocking probability.

**(Lectures 08)**

**Unit III**

Data Communication Networks: Introduction, network architecture, layered network architecture, protocols, data communications hardware, data communication circuits.

Public switched data networks, connection oriented & connection less service, Circuit Switching, packet switching and virtual circuit switching concepts, OSI reference model, LAN, WAN, MAN & Internet. Repeaters, Bridges, Routers and gate ways.

**(Lectures 08)**

**Unit IV**

Integrated Services Digital Network (Isdn) : Introduction, motivation, ISDN architecture, ISDN interfaces, functional grouping, reference points, protocol architecture, signaling, numbering, addressing, BISDN.

DSL Technology: ADSL, Cable Modem, Traditional Cable Networks, HFC Networks, Sharing, CM & CMTS and DOCSIS.

SONET: Devices, Frame, Frame Transmission, Synchronous Transport Signals, STS I, Virtual Tributaries and Higher rate of service.

**(Lectures 08)**

**Text Books**

1. Thyagarajan Viswanath, *Tele Communication Switching System and Networks*, PHI, 2000.
2. Wayne Tomasi, *Advanced Electronic Communications Systems*, PHI, 2004.

**Reference Books**

1. Bellamy J., *Digital Telephony*, John Wiley, 2001.
2. Godbole Achyut. S., *Data Communications & Networks*, TMH, 2004.
3. Taub H. & D. Schilling, *Principles of Communication Systems*, TMH, 2003.
4. Forouzan B.A., *Data Communication & Networking*, TMH, 2004.
5. Flood J.E., *Telecommunication switching, Traffic and Networks*, Pearson Education, 2002

**B. Tech. Semester VI**  
**ENGLISH COMMUNICATION- VI**

Course Code: EHM601

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:** the objective behind this subject is to know about telecommunication network which helpful in telecommunication system.

**Course Contents**

**Unit I**

Press Communication: Essentials of Press Communication, Different types of press communication and their drafting. Inviting Tenders, Press- note, Writing advertisements.

**(Lectures 08)**

**Unit II**

Writing Brochures/Pamphlet, Writing Notices, Agenda for the meeting, writing minutes of the meeting, Itinerary Writing.

**(Lectures 08)**

**Unit III**

Note – Making: make notes on a given passage, with the help of prepared notes write a short paragraph, and the conclusion drawn.

**(Lectures 08)**

**Unit IV**

Reading Comprehension- Reading process, reading with a purpose; reading different kinds of texts/messages, reference materials, business documents, scientific and technical texts.

Reading speed, reading skills, word meaning recognition, guessing meaning from word structure and context, Eye reading and visual perception, scanning skimming, identifying central idea, recognizing main ideas, identifying writing patterns, Intensive reading skills, drawing inferences and conclusions.

**(Lectures 08)**

**Unit V**

Value Based Reading

Essays: "Making Writing Simple", J.B.Priestley

"On Style", Jonathan Swift

"How should One Read a Book", Virginia Woolf.

**(Lectures 08)**

**Texts Books**

1. Singh R.P, *An Anthology of English Essays*, Oxford University Press, New Delhi.

2. Ruther Ford A., *Basic Communication Skills*, Person Education, New Delhi.

**Reference Books**

1. Arora V.N. et al, *Improve Your Writing*, OUP, Delhi.

2. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi.

**\*Note:**

**Internal Marking**

There shall be a continuous evaluation and the marking would be as follows.

**Marks 50**

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks**- Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

**B. Tech. Semester VI  
NEURAL NETWORKS (LAB)**

**Course Code: EEC651**

**L      T      P      C**  
**0      0      4      2**

**List of Experiments**

1. Practical: All the Practicals are based on Any Concerns Software.
2. Design and implementation of artificial neural network to compute XOR for two inputs using feedback artificial neural network.
3. Design a perceptron network to solve Classification problem with different classes of input vectors.(Take two or more classes of input vectors)
4. Design the Perceptron model for pattern recognition. ( Take prototype pattern as example)
5. Simulate Adaline algorithm.
6. Implement Back-propagation simulator.
7. Find out the Fuzzy Relation of the given Fuzzy Sets.
8. Verify any one Defuzzification method.
9. Fuzzy pattern recognition.
10. Design any control system using fuzzy logic in simulink

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech.- Semester VI**  
**ANALOG INTEGRATED ELECTRONICS (LAB)**

Course Code: EEC652

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**Note: Select at least any five out of the following:**

**List of Experiments**

1. To Plot V-I characteristics of junction diode and zener diode.
2. To draw wave shape of the electrical signal at input and output points of the half wave, full wave and bridge rectifiers.
3. To Plot input/output characteristics for common base transistor.
4. To Plot input/output characteristics of FET and determine FET parameters at a given operating point.
5. To determine voltage gain, current gain, input impedance and output impedance of common emitter amplifier.
6. To determine voltage gain, current gain, input impedance and output impedance and frequency response of R-C coupled common emitter amplifier.
7. To design R-C Phase shift/Wein Bridge oscillator and verify experimentally the frequency of oscillation.
8. To study transistor as a switch and determine load voltage and load current when the transistor is ON.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ (5 MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL (50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech. Semester VI**  
**DESIGN OF ELECTRONIC SYSTEMS (LAB)**

Course Code: EEC653

**L      T      P      C**  
**0      0      4      2**

**List of Experiments**

1. Op-Amp characteristics and get data for input bias current measure the output-offset voltage and reduce it to zero and calculate slew rate.
2. Op-Amp in inverting and non-inverting modes.
3. Op-Amp as scalar, summer and voltage follower.
4. Op-Amp as differentiator and integrator.
5. Design LPF and HPF using Op-Amp 741
6. Design Band Pass and Band reject Active filters using Op-Amp 741.
7. Design Oscillators using Op-Amp (i) RC phase shift (ii) Hartley (iii) Colpitts
8. Design (i) Astable (ii) Monostable multivibrators using IC-555 timer
9. Design Triangular & square wave generator using 555 timers.
10. Design Amplifier (for given gain) using Bipolar Junction Transistor.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech. – Semester VI**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE671**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI) .

## B. Tech Semester VII

### DIGITAL INSTRUMENTATION

Course Code: EEC701

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective to techniques involved in digital instrumentations and its engineering applications.

#### Course Contents

##### Unit I

**Theory of Measurement:** Introduction, Performance Characteristics: static & dynamic standards, Error analysis: Sources, types and statistical analysis. (Lectures 08)

##### Unit II

**Transducers Passive Transducers:** Resistive, Inductive and capacitive Active transducers: Thermoelectric, piezoelectric & photoelectric Bridges: Direct current and alternating current bridges, LCR bridges (Lectures 08)

##### Unit III

**Analog Meters:** AC analog meters: Average, Peak and RMS responding voltmeters, sampling voltmeters. Electronics Analog meters: Electronics analog DC and AC voltmeter and ammeters, Electronic analog ohmmeter and multimeter (Lectures 08)

##### Unit IV

**Digital Meters:** Analog to digital converter: Transfer characteristics, A/D Conversion techniques: Simple potentiometric & servo method, successive approximation, ramp type, Integrating & dual-slope integrating method. D/A Converter: Transfer characteristics, D/A conversion techniques Digital mode of operation, performance characteristics of D/A converters. Display devices: Decimal, BCD and straight binary number, indicating system, numeric & alpha number display using LCD & LED, specification of digital meters: display digit & counts resolution, sensitivity, accuracy, speed & settling time etc. (Lectures 08)

##### Unit V

**Oscilloscopes & RF Measurements:** Types of oscilloscopes, controls, Measurements voltage, frequency time & Phase. High frequency measurements – RF impedancy.  
**Probes:** Types of probes, probe loading & measurement effect, probe specifications (Lectures 08)

#### Text Books

1. Anand, *Electronic Instruments & Instrumentation Technology*, PHI Pvt. Ltd., New Delhi 2005
2. Kalsi H.S., *Electronics Instrumentation*, TMH Ed. 2004

#### Reference Books

1. Cooper W.D. & Helfrick A.D., *Electronics Instrumentation & Measurement Techniques*, PHI
2. Oliver & Cage, *Electronic Measurement & Instrumentation*, McGraw Hill

**B. Tech.- Semester VII**  
**DIGITAL SIGNAL PROCESSING**

Course Code: EEC702

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective behind this subject is to know about DFT, FIR filters their design.

**Course Contents**

**Unit I**

**Discrete Fourier Transform:** Frequency Domain Sampling: The Discrete Fourier Transform Frequency-Domain Sampling and Reconstruction of Discrete-Time Signals. The Discrete Fourier Transform (DFT). The DFT as a linear Transformation. Relationship of the DFT to Other Transforms. Properties of the DFT. Periodicity, Linearity, and Symmetry Properties. Multiplication of two DFTs and Circular Convolution. Additional DFT Properties. Frequency analysis of signals using the DFT.

**(Lectures 08)**

**Unit II**

**Efficient Computation of DFT** Efficient Computation of the DFT: FFT Algorithms, Direct Computation of the DFT. Radix-2 FFT algorithms. Efficient computation of the DFT of two real sequences, computations, Efficient computation of the DFT of a 2N Point real sequences, Gortzel Algorithm, Chirp Z-transform algorithm.

**(Lectures 08)**

**Unit III**

**Basic IIR Filter Structures:** Direct forms (I & II), cascade and parallel realizations. Signal flow graph, Transposed structure, Basic FIR filter structures-. Direct form structure, frequency sampling structure, Lattice structure, Linear phase FIR structure. FIR structures.

**(Lectures 08)**

**Unit IV**

Symmetric and Anti-symmetric FIR Filters, Design of Linear-Phase FIR Filters Using Windows, Design of Linear-Phase FIR Filters by the Frequency Sampling Method, Design of FIR, Equiripple filter design Differentiators. Design of Hilbert Transformers.

**(Lectures 08)**

**Unit V**

**Design of IIR Filters from Analog Filters:** IIR Filter Design by Approximation of Derivatives, IIR Filter Design by Impulse Invariance. IIR Filter Design by the Bilinear Transformation. The Matched-z Transformation, Characteristics of Commonly Used Analog Filters. Application of above technique to the design of Butterworth & Chebyshev filters.

**(Lectures 08)**

**Text Books**

1. Proakis, J.G. & Manolakis, D.G., *Digital Signal Processing: Principles Algorithms and Applications*, Prentice Hall (India).

**Reference Books**

1. Sanjit K. Mitra, *Digital Signal Processing*, TMH, 2005
2. Oppenheim A.V. & Schafer, Ronald W., *Digital Signal Processing*, Pearson Education.
3. Rabiner, L.R. and Gold B., *Theory and Applications of DSP*, PHI.
4. DeFatta, D.J., Lucas, J.G. & Hodgkiss, W.S., *Digital Signal Processing*, John Wiley & Sons



## B. Tech Semester VII

### MOBILE AND CELLULAR COMMUNICATION

Course Code: EEC703

L	T	P	C
3	2	0	4

**Objective:** The objective is to understand means and methods involved in effective engineering of mobile and cellular communication.

#### Course Contents

##### Unit I

**Introduction:** PCS Architecture, Cellular Telephony, Cordless Telephony and Low-tier PCS, Third Generation wireless system

**Mobility Management:** Handoff, Inter - BS handoff, Intersystem handoff, Roaming management, Roaming management under SS7 and Roaming management for CT2.

**Handoff Management:** Detection and Assignments, Handoff detection, Strategies for handoff detection, Mobile controlled handoff, Network controlled handoff, Mobile assisted handoff, Handoff failure, Channel assignment, Non- prioritized scheme and Reserved channel scheme, Queuing priority scheme, Sub rating scheme, Implementation issues, Hard handoff – MCHO link transfer, MAHO/NCHO link transfer, Sub rating MCHO link transfer, Soft handoff – adding new BS, dropping a BS.

(Lectures 08)

##### Unit II

**GSM Overview:** GSM Architecture, location tracking and call setup, Security, Data Services – HSCSD, GPRS, Unstructured supplementary service data. GSM Network Signaling – GSM MAP service frame work, MAP protocol machine, MAP dialogue. GSM Mobility management – GSM location update, Mobility databases, Failure restoration, VLR Identification algorithm, VLR Overflow control.

(Lectures 08)

##### Unit III

**GSM Short Message Service:** SMS architecture, SMS protocol hierarchy, Mobile originated messaging, Mobile terminated Messaging. International Roaming for GSM – International GSM call setup, Reducing the International call delivery cost GSM Operations, Administration, and Maintenance – Call recording functions, Performance Measurement and Management, Subscriber and Service data Management. Mobile number portability – Fixed network number portability, Number portability for Mobile networks, Mobile number portability mechanism.

(Lectures 08)

##### Unit IV

VoIP Service for mobile networks – GSM on the Net, iGSM wireless VoIP solution, iGSM procedures and Message flows.

General Packet Radio Services – Architecture, Network nodes, Interfaces, Procedures, Billing, Evolving from GSM to GPRS.

(Lectures 08)

##### Unit V

Wireless Application Protocol – WAP Model, WAP Gateway, WAP Protocol – WDP, WTLS, WTP, WSP, WAE, Mobile station Application execution environment. Third Generation Mobile Services – Paradigm shifts in 3G Systems, W-CDMA, cdma 2000, Improvements on core network, Quality of service in 3G, Wireless Operating System for 3G Handset. Paging Systems – Paging Network Architecture, User Access Interface – Telocator Alphanumeric Input Protocol (TAP), Telocator Message Entry Protocol (TME), Intersystem Interface. Wireless Local Loop – WLL Architecture, WLL technologies.

(Lectures 08)

#### Text Book

1. Rappaport T.S., *Wireless Communication-Principles and Practice*, Pearson
2. Haykin S & Moher M., *Modern Wireless Communication*, Pearson, 2005.

#### Reference Books

1. Yi-Bing Lin & Imrich Chlamtac, *Wireless and Mobile Network Architecture*, Wiley Publication.
2. Kasera Sumit, Narang Nishit, *3G Networks: Architecture, Protocols and Procedures*, TMH
3. William C. Y. Lee, *Mobile Communication Design and Fundamentals*.
4. Kamilo Fehar D. R., *Wireless Digital Communication*.

**B. Tech.- Semester VII**  
**DIGITAL INSTRUMENTATION (LAB)**

**Course Code: EEC751**

**L      T      P      C**  
**0      0      4      2**

**Course Content**

1. Identification, Study & Testing of various electronic components:
  - (a) Resistances - Various types, Color coding
  - (b) Capacitors-Variou types, Coding
  - (c) Inductors
  - (d) Diodes
  - (e) Transistors
  - (f) SCRs
  - (g) ICs
  - (h) Photo diode
  - (i) Photo transistor
  - (j) LED
  - (k) LDR
  - (l) Potentiometers
2. Study of symbols for various Electrical & Electronic Components, Devices, Circuit functions etc.
3. To study and perform experiment on CRO demonstration kit.
4. Soldering & desoldering practice.
  - (a) To Design layout & fabricate PCB for a Regulated dc power supply;
  - (b) Assemble the Regulated power supply using PCB and test it.
5. To study and plot the characteristics of following Opto-Electronic devices
  - (a) LED
  - (b) LDR
  - (c) Photovoltaic cell
  - (d) Opto-coupler
  - (e) Photo diode
  - (f) Photo transistor
6. To study the specifications and working of a Transistor radio kit & perform measurements on it.
7. To study the specifications and working of a VCD Player.
8. To study the specifications and working of color TV.
9. To study the specifications and working of a Tape Recorder kit.
10. To prepare design layout of PCBs using software tools.
11. To fabricate PCB and testing of electronics circuit on PCB.

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ ( 5MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL ( 50 MARKS)

**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B.Tech.- Semester VII**  
**DIGITAL SIGNAL PROCESSING (LAB)**

Course Code: EEC752

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

1. Sampling & Waveform Generation.
2. Quantization
3. PCM Encoding
4. Delta Modulation
5. Digital Modulation Schemes (ASK, PSK, FSK)
6. Error Correcting Codes
7. DFT Computation.
8. Fast Fourier Transform.
9. FIR Filter implementation.
10. IIR Filter implementation.
11. DSP Processor Implementation
12. Computational Experiments with Digital Filters

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

## B. Tech Semester VII EMBEDDED SYSTEM

Course Code: EEC707

L	T	P	C
3	2	0	4

**Objective:** The objective is to familiarize with tools and techniques involved in engineering application of embedded system in modern life style.

### Course Contents

#### Unit I

**Embedded system Introduction:** Introduction to Embedded System, History, Design challenges, optimizing design metrics, time to market, applications of embedded systems and recent trends in embedded systems, embedded design concepts and definitions, memory management, hardware and software design and testing, communication protocols like SPI, SCI, I2C, CAN etc.

(Lectures 08)

#### Unit II

**System Architecture:** Introduction to ARM core architecture, ARM extension family, instruction set, thumb Instruction set, Pipeline, memory management, Bus architecture, study of on-chip peripherals like I/O ports, timers, counters, interrupts, on-chip ADC, DAC, RTC modules, WDT, PLL, PWM, USB etc.

(Lectures 08)

#### Unit III

**Interfacing and Programming:** Basic embedded C programs for on-chip peripherals studied in system architecture. Need of interfacing, interfacing techniques, interfacing of different displays including Graphic LCD (320X240), interfacing of input devices including touch screen etc, interfacing of output devices like thermal printer etc., embedded communication using CAN and Ethernet, RF modules, GSM modem for AT command study etc.

(Lectures 08)

#### Unit IV

**Real Time Operating System Concept:** Architecture of kernel, task scheduler, ISR, Semaphores, mailbox, message queues, pipes, events, timers, memory management, RTOS services in contrast with traditional OS. Introduction to Ucos II RTOS, study of kernel structure of Ucos II, synchronization in Ucos II, Inter-task communication in Ucos II, memory management in Ucos II, porting of RTOS.

(Lectures 08)

#### Unit V

**Embedded Linux:** Introduction to the Linux kernel, Configuring and booting the kernel, the root file system, Root file directories, /bin, /lib etc., Linux file systems, Types of file system: Disk, RAM, Flash, Network. Some debug techniques- Syslog and strace, GDB, TCP/IP Networking- Network configuration, Device control from user space- Accessing hardware directly, Multi processing on Linux and Inter Process Communication- Linux process model and IPCs, Multithreading using p Threads - Threads verses Processes and pThreads, Linux and Real-Time Standard kernel problems and patches.

(Lectures 08)

### Text Books

1. Kopetz H., *Real-Time Systems*, Kluwer, 1997.
2. Gupta. R., “*Co-synthesis of Hardware and Software for Embedded Systems*”, Kluwer 1995.

### References Books

1. Rajkamal, *Embedded Systems*, TMH.
2. Simon David, *Embedded Systems Software Primer*, Pearson
3. Furber Steve, *ARM System-on-Chip Architecture*, Pearson
4. Labrose Jean J, *Micro C/OS-II*, Indian Low Price Edition
5. Prasad K.V.K.K., *Embedded/Real Time System*, Dreamtech
6. Gupta Iyer, *Embedded Real Systems Programming*, TMH
7. Heath Steve, *Embedded System Design*, Neuwans

## B. Tech Semester VII SYSTEM PROGRAMMING

Course Code: ECS715

L	T	P	C
3	2	0	4

**Objective:** The objective is to have knowledge of Programming techniques and its application to various systems.

### Course Contents

#### Unit I

**Introduction to System Software:** Types of Software and Application Software Spectrum of system Software, Need of system Software, Assembler, Loader, Compiler. Symbolic Debuggers, Interpreter, Macro, Operating system and its types. Assembler-Structure of Assembler, Basic Functions, Assembler directives, Types of Assembler, General design specification of an Assembler, Purposes of Passes, Databases for Passes, Literals, Design of Pass I and Pass II Assembler. (Lectures 08)

#### Unit II

**Data Structure:** Stack Array, Queue, Link list, Data Structure, Sorting Technique, Linear and binary search. Macro and Microprocessor- Macro definition and call, Features of macro, Macro expansion, Nested Macros, Design of Microprocessor single pass and two pass microprocessor. (Lectures 08)

#### Unit III

**Loader and Linkage editor:** Basic functions of Loader, Relocation and Linking concepts, and different Loader schemes, other Loader schemes, binders, Linking Loaders, overlay Dynamic Binders, Design issue of Direct Linking Loaders. Compiler- Concept, Phases of compiler, Types of compiler, Parser, Parsing technique, Top-down and Bottom-up parsing, Shift reduce and recursive descent parser, Operator precedence parser, Predictive parser, L-R parser. (Lectures 08)

#### Unit IV

**Operating System Concepts:** Need of OS, Types of OS, like Batch, Time sharing, Multiprogramming, Multitasking real time and personal OS.

**Process Concepts and Management:** Process concepts, process state, process state Transition, PCB, operation on process, OS Services for Process Management.

**Deadlocks:** Principals, Detections, Preventions Recovery and Avoidance Algorithm. Scheduling - Process scheduling long term, middle term and short term scheduling CPU burst, scheduling algorithm and performance evolution. (Lectures 08)

#### Unit V

**Memory Management:** Concept of Memory management, Contiguous Memory allocation, paging and segmentation concepts, virtual memory concept. File Management- File concepts, Access Methods, Directory Structure, single, two, three level structure, Protection, file sharing allocation methods. Dynamic Linking In Windows- (Introduction and concepts only) clipboard, OLE terminology and Technology, Dynamic Data Exchange Dynamic Linking Libraries (DLL). (Lectures 08)

### Tedt Books

1. Jhon J. Donovan, *System Programming*, TMH.
2. Dhamdhare, *System Programming and Operating System*, TMH.

### References Books

1. Beck L., *System Software*, Pearson.
2. Ulman Aho, *Complier Construction*, Pearson LPE.
3. Silberschatz, Galvin, Gagne, *Operating System Principles*, John Wiley and Sons, 7th Ed.
4. Tanenbaum , *Modern Operating System*, Pearson.
5. Bennett J.P., *Compiling Technique*, TMH

## B. Tech.- Semester VII EMBEDDED SYSTEM (LAB)

Course Code: EEC753

L	T	P	C
0	0	4	2

### LAB EXERCISE

- Integrated Development Environment Overview (Project creation, download and debug)
- Study of JTAG Debugger/on-board debugger-emulator.
- ARM Instructions execution (Barrel Shifter, LDR / STR, SMT / LDM)

#### List of Experiments:

##### GROUP - A

1. Writing basic C-programs for I/O operations
2. C-Program to explore timers/counter
3. C-programs for interrupts
4. Program to demonstrate UART operation

##### GROUP - B

5. Program to demonstrate I2C Protocol.
6. Program to demonstrate CAN Protocol.

##### GROUP - C

7. Program to interface LCD
8. Program to interface Keyboard and display key pressed on LCD
9. Program to interface stepper motor

##### GROUP - D

10. Program to demonstrate RF communication
11. Program to implement AT commands and interface of GSM modem
12. Implementation of USB protocol and transferring data to PC.
13. Implementation of algorithm /program for the microcontroller for low power modes.
14. COS II / Embedded Linux RTOS Examples

##### GROUP - E

15. Interfacing 4 x 4 matrix keyboards and 16 x 2 characters LCD displays to microcontroller / microprocessor and writing a program using RTOS for displaying a pressed key.
16. Writing a scheduler/working with using RTOS for 4 tasks with priority. The tasks may be keyboard, LCD, LED etc. and porting it on microcontroller/ microprocessor.

##### GROUP - F

17. Implement a semaphore for any given task switching using RTOS on microcontroller board.
18. Create two tasks, which will print some characters on the serial port, Start the scheduler and observe the behavior.

##### GROUP - G

19. RTOS based interrupt handling using Embedded Real Time Linux.
20. Program for exploration of (Process creation, Thread creation) using Embedded Real Time Linux.

##### GROUP - H

21. Program for exploring Message Queues using Embedded Real Time Linux.
22. Ethernet Based Socket Programming using Embedded Real Time Linux.

#### Note:

1. At least ONE practical should be performed from EACH GROUP.
2. Two practical should be performed using the JTAG debugger / on-board Debugger- emulator.

#### Evaluation of Practical Examination:

##### Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

##### Evaluation Scheme

EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)

##### External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

## B. Tech Semester VII SYSTEM PROGRAMMING (LAB)

Course Code: ECS755

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### List of Experiments:

1. Language Programming for 8085 / 8051.
2. Implementation of sorting method (Any two) in C / C++.
3. Implementation of searching methods (Linear and Binary Search) in C / C++.
4. Implementation of stack/queue using linked list data structure in C / C++.
5. Develop an application to simulate first pass of two pass assembler for 8085 Microprocessor.
6. Design of simple Loader.
7. Design of Parser for a subset of C by using C / C++.
8. Design of Line and Screen Editor in C / C++.
9. Design of Microprocessor (Nested Macro Calls within definition) in C / C++.
10. Implementation of CPU Scheduling algorithm,
11. Implementation of memory management algorithm.
12. Implementation of interprocess Communication.

### Evaluation of Practical Examination:

#### Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

#### Evaluation Scheme

EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ ( 5MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL ( 50 MARKS)
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#### External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

## B. Tech Semester VII INFORMATION THEORY & CODING

**Course Code: ECS714**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective to be familiar with information theory and coding for optimize and fast and error-free data exchange between systems.

### Course Contents

#### Unit I

Information theory - information and entropy - properties of entropy of a binary memory less source - extension of a binary memory less source - source coding theorem - Shannon fano coding - Huffman coding – Lempel-Ziv coding - binary symmetric channel – mutual information - properties - channel capacity - channel coding theorem.

**(Lectures 08)**

#### Unit II

Coding - linear block codes - generator matrices - parity check matrices - encoder syndrome and error correction - minimum distance - error correction and error detection capabilities - cyclic codes - coding and decoding.

**(Lectures 08)**

#### Unit III

Introduction to algebra - groups - fields - binary field arithmetic - construction of Galois field - basic properties - computations - vector spaces - matrices - BCH codes - description - decoding - Reed Solomon codes.

**(Lectures 08)**

#### Unit IV

Coding - Convolutional codes - encoder - generator matrix - state diagram – distance properties - maximum likelihood decoding - viterbi decoding - sequential decoding.

**(Lectures 08)**

### Text Books

1. Abramson Norman, *Information Theory*, John Wiley
2. Lin Shu & Costello D.J., *Fundamentals and Applications of Error- Control Coding* PHI

### Reference Books

1. Simon Haykin, *Digital Communications*, John Wiley
2. Taub & Schilling, *Principles of Communication System*, Tata McGraw Hill
3. Tomasi, *Electronic Communication, Fundamentals Through Advanced*, Pearson Education
4. Sklar, *Digital Communication*, Pearson Education
5. Cover T. & Thomas, *Elements of Information Theory*, John Wiley & Sons 1991.



## B. Tech Semester VII ARTIFICIAL INTELLIGENCE

Course Code: ECS705

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to understand computer techniques and simulate artificial intelligence

### Course Contents

#### Unit 1

**Introduction to AI:** Intelligent agents, Perception, Natural language processing, Problem, Solving agents, searching for solutions: Uniformed search strategies, informed search strategies.

**(Lectures 08)**

#### Unit 2

**Knowledge and reasoning:** Adversarial search, Optimal and imperfect decisions, Alpha, Beta pruning.

**Logical agents:** Propositional logic, First order logic, Syntax and semantics, Using first order logic, Inference in first order logic.

**(Lectures 08)**

#### Unit 3

Uncertainty, Acting under uncertainty, Basic probability notation, Axioms of probability, Baye's rule, Probabilistic reasoning, and making simple decisions.

**(Lectures 08)**

#### Unit 4

**Planning:** Planning problem, Partial order planning, Planning and acting in nondeterministic domains.

**Learning:** Learning decision trees, Knowledge in learning, Neural networks, Reinforcement learning, Passive and active.

**(Lectures 08)**

#### Unit 5

**Expert Systems:** Definition, Features of an expert system, Organization, Characteristics, Prospector, Knowledge Representation in expert systems, Expert system tools, MYCIN, EMYCIN.

**(Lectures 08)**

### Text Books

1. Elain Rich & Kevin Knight, *Artificial Intelligence*, Second Edition Tata McGraw Hill, 1995.
2. Patterson W., *Introduction to Artificial Intelligence and Expert Systems*, Prentice Hall of India, 2003

### References Books

1. Russel Stuart & Norvig Peter, *Artificial Intelligence - A Modern Approach*, PHI.
2. Donald A. Waterman, *A Guide to Expert Systems*, PHI.
3. George F. Luger, *Artificial Intelligence – Structures and Strategies for Complex Problem Solving*, Pearson Education, 2002.
4. Janakiraman, K. Sarukesi *Foundations of Artificial Intelligence and Expert Systems*, Macmillan Series in Computer Science

## B. Tech Semester VII DATABASE MANAGEMENT SYSTEM

Course Code: EEC706

L	T	P	C
3	2	0	4

**Objective:** The objective is to understand database optimized management thereof

### Course Contents

#### Unit I

**Introduction to DBMS:** Basic concepts, advantages of a DBMS over file processing system, Data abstraction, Data models and data independence, components of a DBMS and overall structure. Database terminology

**Database Administration issues:** DBA role, indexes. Data dictionary, security, backups, Replication, SQL support for DBA, commercial RDBMS selection

**Data Modeling:** Basic concepts, types of data models, E-R data model and Object oriented data model, relational, network and hierarchical data models and their comparison, E-R and ER diagramming.

(Lectures 08)

#### Unit II

**Relational Model:** Basic concepts, attributes and domains, interaction and extensions of a relation, concept of integrity and referential constraints. Relational query languages (relational algebra, relational calculus), concepts of view and trigger .

(Lectures 08)

#### Unit III

**SQL:** Structure of a SQL query, DDL and DML, SQL queries, set operations. Predicates and join membership, tuple variables, set comparison, ordering of tuples, aggregate functions, nested query. Database modification using SQL, Dynamic and embedded SQL and concepts of stored procedure, Query optimization .

(Lectures 08)

#### Unit IV

**Relational Database Design:** Need of normalization, Notation of a normalized relation, Normalization using functional dependency, Multi-valued dependencies and join dependency, 1NF, 2NF, 3NF, BCNF, 4NF.

**Transaction Management:** Basic concepts of transaction, components of transaction management (concurrency control, Recovery system), Different concurrency control protocols such as Time stamps and locking, different crash recovery such as log based recovery and shadow paging, concepts of cascaded abort, Multi-version concurrency control methods.

(Lectures 08)

#### Unit V

**Object oriented DBMS:** Review of object oriented concepts: Objects, Classes, attributes, Messages, Inheritance, and Polymorphism etc. Object schemas, Class subclass relationships, inter-object relationships, features of object oriented DBMS and ORDBMS, concepts of OID, persistence of objects in OODBMS, Physical organization, object-oriented queries, schemas modifications, Temporal databases, Active databases.

(Lectures 08)

### Text Books

1. Henry F. Korth, Abraham Silberschatz, *Database System Concepts*, McGraw Hill Inc
2. Date, *Introduction to Database Management Systems*, Pearson LPE.

### Reference Books

1. Singh, *Database Systems: Concepts, Design & Application*, Pearson LPE
2. Kahate, *Introduction to Database Management Systems*, Pearson LPE.
3. Narang Rajesh, *Database Management System*, PHI
4. Elmasri, Navathe, Somayajulu, Gupta, *Fundamentals of Database Systems*, Pearson
5. ISRD, *Introduction to Database Management System*, Tata McGraw Hill
6. Connolly, *Database Systems*, Pearson LPE.
7. Desai Bipin, *Introduction to Database Management Systems*, Galgotia.
8. Vig Renu, *Fundamentals of Database Management Systems*, ISTE learning materials centre
9. Phillip Pratt, *Concepts of DBMS*, Thomson Learning.
10. Phillip Pratt, *A Guide to SQL*, Thomson Learning.
11. Jain V.K., *Database Management System*, Dreamtech Press (Wiley India)

**B.Tech.- Semester VII**  
**ENGLISH COMMUNICATION-VII**

Course Code: EHM701

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Objective:** The objective of the course is to perk up the technical writing skills orator skill and public speaking.

**Course Contents**

**Unit I**

**Technical communication:** Nature, origin and scope: Features, difference between technical writing and general writing, Significance, style, Objective style as Contrary to Literary Composition, Forms of Technical communication, Distinction between formal and informal writing.

**(Lectures 06)**

**Unit II**

**Reports:** Types, Significance, Structure, Style of Report, Project report, thesis, Dissertation writing,

**(Lectures 06)**

**Unit III**

**Technical Paper and scientific article writing:** Elements, methods, and technical objectives.

Technical proposal: Nature, division, kinds & uses.

**(Lectures 06)**

**Unit IV**

**Oratory Skills and Public Speaking:** Basic steps in the practice of speech, analyzing audience, kinds of speeches, voice modulations, expressions, Developing the speech, Actual delivery.

**(Lectures 06)**

**Unit V**

Value Based Reading

**Essays:** “The Aims of Science and the Humanities”, ME Prior

“The Language of Literature and Science”, A. Huxley

“Man and Nature”, J. Bronowski.

**(Lectures 06)**

**Texts Books**

1. Singh R.P, *An Anthology of English Essays*, Oxford University Press, New Delhi.

2. Cauvery. B, *Effective English for Engineering students*, Macmillan, New Delhi.

**Reference Books**

1. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi.

2. Chauhan, Abnish Singh, *Speeches of Swami Vivekananda & S.C. Bose: A Comparative Study*, Prakash Book Depot, Bareilly.

3. Krishna Mohan and Mamta Banerjee, *Developing Communication Skills*, Macmillan India Ltd., Delhi.

**\*Note:**

**Internal Marking**

There shall be a continuous evaluation and the marking would be as follows.

**Marks 50**

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** –Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks-** Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

**B. Tech Semester VII  
INDUSTRIAL TRAINING  
(PRESENTATION BASED ON INDUSTRIAL TRAINING DONE AFTER THE  
VI SEMESTER EXAMINATION IN SUMMER)**

**Course Code: EEC791**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>

Students will go for Industrial training of six weeks in any industry or reputed organization after the VI semester examination in summer. The evaluation of this training shall be included in the VII semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the VI semester and shall be the nodal point for coordination of the training.

Students will also be required to prepare an exhaustive technical report of the training during the VII semester which will be duly signed by the officer under whom training was taken in the industry/organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Director of the college.

The student at the end of the VII semester will present his report about the training before a committee constituted by the Director of the College which would comprise of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately to the Director in a sealed envelope.

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

**Internal: 100 marks**

By the Faculty Guide - 50 marks

By Committee appointed by the Director – 50 marks

**External: 50 marks**

By Officer-in-charge trainee in industry – 50 marks

By External examiner appointed by the University – 50 marks

**B. Tech. – Semester VII**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE771**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)

## B. Tech Semester VIII PRINCIPLES OF MANAGEMENT

Course Code: EHM804

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to impart knowledge about management policies, planning, implementation & how to grow an organization.

### Course Contents

#### Unit I

Planning: Planning, types of plans, major steps in managerial planning, Organizing, nature and purpose, process of organization, basic departmentation. Coordination, nature purpose and process of coordination. Supervision, Leadership: purpose, functions, types.

(Lectures 08)

#### Unit II

Communication, process of communication, effective communication, barriers to communication.

**Motivation:** What is motivation, factors involved, theories, motives in organization.

(Lectures 08)

#### Unit III

**Controlling-Nature and purpose:** Management of change: forces of change, strategies of change, resistance to change.

(Lectures 08)

#### Unit IV

**Human elements in management:** Factors in individual behaviour, Perception, Learning, Personality development, Interpersonal relationship & group behaviour, Conflict management Stress management, sources of stress, consequences, strategies of stress management.

(Lectures 08)

### Text Books

1. Gupta CB , *Principles and Practices of Management* .
2. Prasad, L.M., *Principles of Management*” ,

### Reference Books

1. Koontz, H & Weihrich. *H. Management: A Global Perspective*.
2. Robbins, S. P. *Organizational Behaviour*.

## B. Tech Semester VIII VLSI TECHNOLOGY

Course Code: EEC801

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** the objective behind this subject is to know about transistor its working, MOSFET, FET, electric fields etc.

### Course Contents

#### Unit I

Carrier concentration, Fermil level Drift of carrier in electrical and magnetic fields. Carrier life time diffusion of carrier.

**(Lectures 08)**

#### Unit II

**PN Junctions:** Equilibrium condition, forward and reverse bias junction, reverse bias breakdown, Metal semiconductor junction.

**(Lectures 08)**

#### Unit III

**Field Effect Transistor:** Junctions FET, Metal semiconductor FET and MOS FET Transistor.

**(Lectures 08)**

#### Unit IV

Fundamental of BJT operation minority carrier distribution and terminal currents, Secondary effects in transistor, Kirk effect.

**(Lectures 08)**

#### Unit V

Introduction to monolithic integrated circuit, Diffusion, Long implantation, Epitaxy, Oxidation, Photolithography and etching, Metallization, Future trends in VLSI.

**(Lectures 08)**

#### Text Books:

1. Sze S.M., *VLSI Technology*, Mc Graw-Hill.
2. Pucknell D.A. & Eshraghian, *Basic VLSI Design*, PHI
3. Wayne Wolf, *Modern VLSI Design Systems on Silicon*, Pearson Pub.

#### Reference Books

1. Gandhi S., *VLSI Fabrication Principles*, John Willey.
2. Wayne Wolf, *Modern VLSI Design Systems on Silicon*, Pearson Pub.
3. Campbell. S.A., *The Science and Engineering of Microelectronic Fabrication*, Oxford Univ. Press 1996
4. Smith, *Microelectronic Circuits International*, Oxford.
5. Milman & Grabel, *Microelectronics*, McGraw-Hill.

**B.Tech.- Semester VIII**  
**TELEVISION AND CONSUMER ELECTRONICS**

Course Code: EEC803

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is to understand televisions and other consumer electronic gadgets and their role in modern life style.

**Course Contents**

**Unit I**

**Basic concept of Television:** TV broadcasting, Scanning methods, Synchronization, Aspect ratio, Kell factor, Horizontal and Vertical resolution, video bandwidth, positive and negative modulation. Composite video signal.

**Camera Tubes:** Image Orthicon, Vidicon, Plumbicon, Saticon, Silicon diode array, Television transmission: VSB transmission, TV channels, TV standards, TV Channels bands, block diagram of monochrome TV receiver.

**(Lectures 08)**

**Unit II**

**Colour Television Receivers:** Colour fundamentals, compatibility, frequency interleaving, colour mixing. Colour camera tube, picture tubes – static and dynamic convergence, colour purity. PAL, SECAM, NTSC system concept, encoder and decoder and their comparison. Colour TV transmitter and receiver block diagram.

**(Lectures 08)**

**Unit III**

**Advanced TV System and Techniques:** Introduction to digital compression technique: GPEG, MPEG.

**Block diagram of digital TV:** transmitter and receiver, HDTV- transmitter and receiver, DTH system, Video on demand. Introduction of Plasma and LCD TV. Cable TV. Introduction of 3D DTV system. CCTV, digital terrestrial TV (DTT).

**(Lectures 08)**

**Unit IV**

**Methods of sound, video recording and reproduction:** Disc recording, magnetic recording, optical recording- CD and DVD.

**Monophony, stereophony, Hi-Fi system. PA system:** Block diagram, requirement, characteristics, its planning for various uses. Introduction to satellite radio reception (word space).

**(Lectures 08)**

**Unit V**

**Modern Home Appliances:** Block Diagram and working of FAX Machine, Washing Machine, Microwave Oven, Video Games, CD and DVD players, Digital diary. Internet Applications: E-mail, FTP, WWW. Solar Cells and Panels. Introduction to Palm Top, Pen Drive.

**(Lectures 08)**

**Text Books**

1. Dhake A. M., *TV and Video Engineering*, TMH
2. Gupta R. G., *TV Engineering and Video System*, TMH

**Reference Books**

1. Jack Kelth, *Video Demisified*, Penram International
2. Bali S. P., *Colour TV Theory and Practice*, TMH
3. Bernard Grobb, Charles E - *Basic TV and Video System*, TMH (6Th Ed.)
4. Gulati R. R., *Monochrome and Colour TV*, New Age
5. Philips Handbooks on *Audio, Video and Consumer Electronics Application Notes*
6. Olson, *High Quality Sound Recording and Reproduction*



## B. Tech.- Semester VIII VLSI TECHNOLOGY (LAB)

Course Code: EEC851

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### List of Experiments

#### PART-I

Schematic design and make Device Level Layout of following circuits.

1. BJT/FET Amplifier in various configuration.
2. Counters, Shift Registers & Sequence Decoders.
3. Various circuits with Op-Amp.

#### PART-II

Design of following ckt using appropriate software like VHDL/ FPGA.

1. 3-input NAND gate.
2. Half adder
3. D-Latch
4. Serial in-serial out shift register.

#### PART-III

To perform following experiments based on Fiber Optic Trainer.

1. To set up Fiber Optic Analog link.
2. To set up fiber Optic Digital link.
3. Measurement of Propagation loss and numerical aperture.
4. Characterization of laser diode and light emitting diode.

### Evaluation of Practical Examination:

#### Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

#### Evaluation Scheme

EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)	VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
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External Evaluation (50 marks)

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech. - Semester VIII**  
**TELEVISION AND CONSUMER ELECTRONICS (LAB)**

Course Code: EEC852

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

1. Study of colour TV Receiver
2. Voltage and Waveform analysis for colour TV.
3. Alignment and fault finding of colour TV using wobbuloscope and pattern generator (02 Expts.)
4. Study of DTH and Set Top Box.
5. Study of CD / DVD player.
6. Practical Visit to TV transmitter / Studio.
7. Study of PA system with cordless microphone.
8. Study of Audio System, MP3 player, Satellite radio.
9. Study of HDTV.
10. Study of Digital TV.
11. Web page designing.
12. Study of Tape recorder

**Note:** Minimum EIGHT practicals are to be performed

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

## B. Tech. - Semester VIII

### OPTICAL FIBRE NETWORK

Course Code: EEC805

L	T	P	C
3	2	0	4

**Objective:** Optical fibre is changing the speed of data communication in modern life style this subject aims at familiarizing students with the various tools and tackles involved in effective use of optical fibres..

#### Course Contents

##### Unit I

**Introduction to Optical Fiber Communication System:** Block diagram of OFCS, Advantage and Disadvantage of OFCS over other communication systems. Ray theory of transmission and concept of acceptance angle and Numerical Aperture (Numericals based on this), Meridional and skew propagate wave theory of optical propagation: cut – off wavelength. Group velocity and Group delay, Types of fibers (According to materials, Refractive index profile, Mode of propagation ) Fiber Optic Splices, connectors, couplers, Directional Coupler. (Lectures 08)

##### Unit II

**Light Sources and Detectors Sources:** Factors or Characteristics for their selection in OFCS.

**Types:** Light Emitting diodes, Laser diodes, Surface emitter LEDs, Edge emitter LEDs, Super luminescent LEDs, LED operating Characteristics, Modulation Bandwidth: 3-dB electrical bandwidth, 3-dB optical Bandwidth, Radiation patterns of surface and Edge emitters.

**Laser Diode:** Laser principles, semiconductor laser diode, Hetero junction Laser, strip- geometry lasers, Distributed feedback lasers, laser diode operating Characteristics, Radiation patterns.

**Detectors:** Characteristics or factors for their Selection, P-N photo diode, P-I-N Photo diode, Avalanche photodiode, detector parameters: Quantum efficiency, Responsivity, speed of Response (Numericals based on this).

(Lectures 08)

##### Unit III

**Modulation:** Non coherent/Coherent

**Intensity Modulation:** LED Modulation and Circuits (Analog and digital) Analog modulation formats; AM/IM Sub carrier Modulation, FM/IM Sub carrier Modulation. Digital Modulation formats; PCM: RZ, NEZ, Manchester, Bipolar codes, Other digital formats: PPM, PDM, OOK, FSK and PSK.

**Detection:** (Coherent detection/Heterodyne/Homodyne detection): Optical heterodyne receivers, Optic Frequency Division Multiplexing. (Lectures 08)

##### Unit IV

**Losses in Fibers:** Absorption, scattering and bending losses. Signal distortion in optical fiber: Material dispersion, waveguide dispersion, intermodal dispersion. Noise in optical fiber: Thermal Noise, shot noise, S/N Ratio, Noise equivalent power (Numerical based on this)

**Fiber Optics System Design:** Optical power budgeting, Rise-time budget.

**Optical Fiber Measurements:** Measurement of Attenuation, dispersion, refractive index.

**Field Measurements:** Optical time domain reflectometry ( OTDR ) .

(Lectures 08)

##### Unit V

**Advanced Systems and Techniques:** Wavelength Division Multiplexing, DWDM, optical amplifiers, Optical filters, Integrated optics, Optical Networks: SONET/SDH, Photonic switching, Local Area Networks, Optical Sensors. (Lectures 08)

#### Text Books

1. Jonn M. Senior , *Optical Fiber Communication ( Principles and Practice)*, Pearson
2. Pal B.P., *Optical Fiber Systems and Sensors*
3. Agrawal Govind P., *Fiber Optic Communications Systems*, Wiley.

#### References Books

1. Keiser G., *Optical Fiber Communication*, McGraw Hill
2. Joseph Palais, *Fiber Optic Communications*, Pearson
3. Wilson Hawkes , *Opto Electronics*, PHI

# B. Tech - Semester VIII COMPUTER NETWORKS

Course Code: ECS810

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** To familiarize students with the layered design and protocols of computer networks, including the Internet.

## Course Contents

### Unit I

**Introduction Concepts:** Goals and Applications of Networks, Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies – Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics , ISDN.

**(Lectures 08)**

### Unit II

**Medium Access Sub Layer:** Medium Access sub layer - Channel Allocations- ALOHA protocols, Error – detection and correction – Parity – LRC – CRC – Hamming code – flow Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

**(Lectures 08)**

### Unit-III

**Network Layer:** Internet works – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers

**(Lectures 08)**

### Unit IV

**Transport Layer:** Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of Services (QoS) – Integrated Services.

**(Lectures 08)**

### Unit V

**Application Layer:** Domain Name Space (DNS), File Transfer, Access and Management, Electronic mail, Virtual Terminals, WWW – Security – Cryptography.

**(Lectures 08)**

## Text Books

1. Forouzen, *Data Communication and Networking*, TMH
2. Godbole Achyut S, *Data Communicatons & Networks*, TMH
3. Behrouz A.Forouzan, *TCP/IP Protocol Suit*.

## Reference Books

1. Stallings W., *Data and Computer Communication*, Macmillan Press
2. Tanenbaum A.S., *Computer Networks*, Prentice Hall India, 1997.
3. Keshav S., *An Engineering Approach on Computer Networking*, Addison Wesley
4. Larry L.Peterson and Peter S. Davie, *Computer Networks*, Harcourt Asia Pvt. Ltd.

**B.Tech. - Semester VIII**  
**OPTICAL FIBRE NETWORK (LAB)**

**Course Code: EEC857**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

**List of Experiments**

1. Electrical characteristics of (Different type LED)
2. Photometric characteristics of LED / LD ( Polar Plot, Intensity Measurement )
3. NA Measurement for Single / Multi de, Gi / S1, fiber
4. Attenuation Measurement of optical fiber
5. Spectral characteristics of LED / LD
6. Fiber optic Analog/Digital transmitter/receiver parameter measurement
7. Study of fiber optical connectors
8. Spectral response of optical fiber
9. Parameter measurement of opto isolator
10. Study of OTDR.

**Note:** Minimum **EIGHT** practicals are to be performed

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech.- Semester VIII  
COMPUTER NETWORK (LAB)**

Course Code: ECS861

**L      T      P      C**  
**0      0      4      2**

**List of Experiments**

1. Implementation of LAN using star topology and connectivity between two computers using crossover UTP5 cable.
2. To establish internet connectivity using dial up modem on windows system.
3. Study of network components such as Preparation of various cables, information attenuator, hubs, switches, bridges, routers, gateways, color codes of AT and T ( 2 Practicals)
4. Study of MODEM Trainer kit
5. Study of RAM for MODEM
6. Study of CDMA Trainer
7. Study of GSM Trainer

**Evaluation of Practical Examination:**

**Internal Evaluation (50 marks)**

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

**Evaluation Scheme**

<b>EXPERIMENT (25 MARKS)</b>	<b>ATTENDANCE (10 MARKS)</b>	<b>QUIZ ( 5MARKS)</b>	<b>VIVA (10 MARKS)</b>	<b>TOTAL INTERNAL ( 50 MARKS)</b>
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**External Evaluation (50 marks)**

The external evaluation would be done by the external faculty based on the experiment conducted during the examination

**B. Tech. - Semester VIII**  
**SATELLITE COMMUNICATION**

**Course Code: EEC804**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** Satellites have increased the speed of communication in modern times exponentially. This course familiarizes the students with techniques and equipment involved in engineering various satellite communication systems.

**Course Contents**

**Unit I**

**Introduction:** General background, frequency allocations for satellite services, basic satellite system, system design considerations, applications. **Satellite Orbits:** Introduction, laws governing satellite motion, orbital parameters, orbital perturbations, Doppler effects, geostationary orbit, antenna look angles, antenna mount, limits of visibility, Earth eclipse of satellite, sun transit outage, inclined orbits, sun-synchronous orbit, launching of geostationary satellites.

**(Lectures 08)**

**Unit II**

**Wave Propagation and Polarization:** Introduction, atmospheric losses, ionospheric effects, rain attenuation, other impairments, antenna polarization, polarization of satellite signals, cross polarization discrimination, ionospheric depolarization, rain depolarization, ice depolarization. **Satellite Antenna:** Antenna basics, aperture antennas, parabolic reflectors, offset feed, double reflector antenna shaped reflector systems.

**(Lectures 08)**

**Unit III**

**Link Design:** Introduction, transmission losses, link power budget equation, system noise, carrier to noise ratio for uplink and downlink, combined uplink and downlink carrier to noise ratio, inter modulation noise.

**Multiple Access Techniques:** Introduction, FDMA, TDMA, FDMA / DMA, operation in a multiple beam environment, CDMA, multiple access examples.

**(Lectures 08)**

**Unit IV**

**Satellite Transponder:** Transponder Model, Satellite front end, RF filtering of digital carrier, Satellite signal processing Transponder limiting. **Communication Satellites:** Introduction, design considerations, lifetime and reliability, spacecraft sub systems, spacecraft mass and power estimations, space segment cost estimates. **Earth Stations:** Introduction, design considerations, general configuration and characteristics.

**(Lectures 08)**

**Unit V**

**Non Geostationary Orbit Satellite Systems:** Introduction, reasons, design considerations, case study, example of systems.

**Satellite Applications:** INTELSAT Series, INSAT, VSAT, DBS Television and Radio, Remote sensing, Mobile satellite services: GSM and GPS, Satellite navigation system, DTH, Internet Connectivity, Video Conferencing.

**(Lectures 08)**

**Text book:**

1. Timothy Pratt, Charles Bostian, Jeremy Allnut - *Satellite Communications*, John Wiley & Sons,
2. Martin J., *Communication Satellite Systems*, PHI Publication.

**Reference Books**

1. Richharia M., *Satellite Communications Systems*, Mc Millan Publication.
2. Roddy Dennis, *Satellite Communications*, Mc-Graw Hill publication.
3. Robert M. Gagliardi, *Satellite Communication*, CBS Publishers and Distributors,

**B. Tech Semester VIII**  
**ADVANCED MICROPROCESSORS AND MICROCONTROLLERS**

**Course Code: EEC806**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>0</b>	<b>4</b>

**Objective:** The objective is in-depth study of microprocessors, assembly language and engineering applications thereof.

**Course Contents**

**Unit I**

**Mode of Operation of Higher Order Processors:** Real mode and protected mode Real mode and protected mode memory addressing, access right byte, Memory paging, System descriptors, Multi Tasking & TSS. **(Lectures 08)**

**Unit II**

**Instruction Set of higher order processors (8086 to Pentium):** Comparison with 8086 in real mode: Generalized instruction set format Addressing Mode: DRAM & BRAM Categorization of instruction set of INTEL processors.

**Integer instructions:** Data transfer instructions, arithmetic and logical operations, string instructions, branch control instructions, procedure call instruction and return instruction.

**(Lectures 08)**

**Unit III**

**Processing of CALLS, INTERRUPTS & EXCEPTIONS:** Privilege levels; ENTER and LEAVE Instructions, INT N. IRET. Interrupt processing sequence, Protected mode interrupts. **(Lectures 08)**

**Unit IV**

**Assembly Level Programming:** ROM BIOS Routines, MS DOS BIOS Routines, Assembling a program using Assembler, exe and. com programs. Mixed Language Programming: using Assembly with C/C ++. **(Lectures 08)**

**Unit V**

**Microcontrollers:** Introduction, basic functions, applications of 8-bit and 16-bit microcontrollers.

**8-bit microcontrollers INTEL 8051:** Internal Architecture, signals, memory organization and interfacing, Timing and control, port operations, interrupts and I/O addressing. Instruction Set and programming.

**16-bit microcontrollers INTEL 8096:** Architectural description, memory Organization and interfacing, I/O addressing, Interrupts, instruction set and programming. **(Lectures 08)**

**Text Books**

1. Ray, A.K. & Burchandi, K.m., *Advanced Microprocessors and Peripherals: Architecture, Programming and Interfacing*, Tata Mc.Graw Hill.
2. Sing Renu & Singh B.P., *Advanced Microprocessors and Microcontrollers*, New Age International.
3. Kant Krishna, *Microprocessors and Microcontrollers*, PHI Learning.
4. Brey, Barry B., *The INTEL Microprocessors*, Pearson Education.

**Reference Books**

1. Ayala, *The 8051 Micro Controller*, Centage Learning.
2. Mazidi M.A., Maizidi J.G. Mckinlay R.D., *The 8051 Microcontroller and Embedded Systems*, Pearson Education.
3. Rajkamal, *The Concept and Feature of Microcontrollers 68HC11, 8051 and 8096*, S. Chand
4. Peatman John, *Design with Microcontroller*, Mc.-Graw Hill Publishing.



**B. Tech. - Semester VIII**  
**ENGLISH COMMUNICATION VIII**

Course Code: EHM801

L	T	P	C
3	0	0	3

**Objective:** The objective behind the course is to develop the professionalism in students through teaching the listening comprehension, Presentation strategies, and the skills of good speaking.

**Course Contents**

**Unit I**

**Spoken English:** Phonemes, Allophones, Phonetic Symbols, Phonetic transcription, Vowel, Consonants sounds, Stress, rhythm, intonation. (Lectures 06)

**Unit II**

**Listening Comprehension:** The Listening process, Hearing and Listening, Types of Listening, Listening with a purpose, Barriers to Listening, Effective Listening Strategies, Comprehension of Speech, Reproduction of response, Note-taking. (Lectures 06)

**Unit III**

**Presentation Strategies:** Defining Purpose, Audience and locale, Audio- visual aids, Preparing outline, Time dimension, organizing, Nuances and delivery, Body Language- space, Setting nuances of voice dynamics. (Lectures 06)

**Unit IV**

**The Skills of Good Speaking:** Improving voice and Speech, Art of public speaking/conversation, Using visual aids, Job Interviews, Being interviewed by the media, Dealing with the Boss, Dealing with Subordinates, How to run a meeting. (Lectures 06)

**Unit V**

Value Based Reading

**Essay:** "The Mother of Sciences", A.J.Bahm

"Science and Survival", Barry Commoner

"The Effect of Scientific Temper", Bertrand Russel. (Lectures 06)

**\*Note: At the end of the eighth semester there will be a viva – voce of 50 Marks**

**Texts Books**

1. Cauvery. B, *Effective English for Engineering students*, Macmillan, New Delh
2. Sethi and Dhamija, *A Course in Phonetics and Written English*, Prentice Hall, New Delhi.

**Reference Books**

1. Arora V.N. et al, *Improve Your Writing*, OUP, Delhi.
2. Mohan K. & Sharma R.C, *Business Correspondence of Report Writing*, TMH, New Delhi.

**\*Note:**

**Internal Marking**

There shall be a continuous evaluation and the marking would be as follows.

**Marks 50**

**Part A – 25 marks** Would be based on the pattern of internal evaluation of all theory papers viz two internal examinations of 7.5 marks each, regular assessment through tutorials and class assignments – 5 marks and attendance -5 marks.

**Part B – 25 marks** Students are required to read the daily word and sentence written on the White Board at the entrance of the college along with its meaning.

**10 marks** -Random class test would be held in the Classes which will be based on the words and sentences written on the white board only.

**15 marks**- Would be based on a project report that the student would write and would present the same to the committee comprising of three members to be appointed by the Director of the college.

The committee will assess the performance of the student on the basis of project done and presentation made before committee.

## **B. Tech.- Semester VIII PROJECT WORK**

**Course Code: EEC891**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>

Students based on their subject of choice should devote themselves to make a project which preferably should be a working model of their thoughts.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the VI semester.

The project shall be finalized by the students before the start of the VII semester and shall be completed and submitted at least one month before the last teaching day of the VIII semester, date of which shall be notified in the academic calendar.

The assessment of performance of students should be made at least twice in each semester i.e. VII and VIII and each internal assessment shall be for 25 marks. The student shall present the final project live as also using overheads project or power point presentation on LCD to the internal committee as also the external examiner.

The evaluation committee shall consist of faculty members constituted by the college which would comprise of at-least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Director. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately to the Director in a sealed envelope.

Not more than three students would form a group for such industrial training/ project submission.

The marking shall be as follows.

**Internal: 100 marks**

By the Faculty Guide - 50 marks

By Committee appointed by the Director – 50 marks

**External: 50 marks**

By External examiner appointed by the University – 100 marks

**B. Tech. – Semester VIII**  
**DISCIPLINE & GENERAL PROFICIENCY**

**Course Code: ECE871**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Guidelines**

There shall be continuous evaluation of the student on the following broad parameters:

1. Observance of dress code
2. Participation in Conferences /Workshops / Seminars
3. Attendance in guest lectures, invited talks and special technical sessions organized from time to time..
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule & regulations in the College/University.
7. Behaviour in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behaviour

The above is an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of cumulative Performance Index (CPI)