COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS AND COMMUNICATION ENGINEERING

For
B.TECH FOUR YEAR DEGREE PROGRAMME
(Applicable for the batches admitted from 2020-2021)

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
Bollikunta, Warangal-506 005
Telangana State, India.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

B.TECH. ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE

(R20 Regulations applicable for the batches admitted from Academic Year 2020-21)

I SEMESTER

S.No.	Course Code	Title of the Course	L	T	P	Credits
1	B20MA01	Linear Algebra & Calculus	3	1	0	4
2	B20CS01	Programming for Problem Solving	4	0	0	4
3	B20PH01	Modern Physics	3	0	0	3
4	B20CH02	Chemistry	3	0	0	3
5	B20ME01	Engineering Drawing	0	0	4	2
6	B20PH05	Physics Lab	0	0	3	1.5
7	B20CS02	Programming for Problem Solving Lab	0	0	3	1.5
8	B20MC01	Induction Program				
		Total Credits	**13**	**01**	**10**	**19**

II SEMESTER

S.No.	Course Code	Title of the Course	L	T	P	Credits
1	B20MA02	Differential Equations & Vector Calculus	3	1	0	4
2	B20EC01	Basic Electronic devices	3	1	0	4
3	B20EE03	Electrical Circuits	3	0	0	3
4	B20CS05	Basic Python programming	3	0	0	3
5	B20EN02	English Language and Interactive Communication Skills Lab	0	0	3	1.5
6	B20EC02	Basic Electronic Devices Lab	0	0	3	1.5
7	B20CS09	Basic Python programming Lab	0	0	3	1.5
8	B20ME03	Engineering & IT Workshop	0	0	3	1.5
9	B20MC02	Sports				
		Total Credits	12	02	12	20

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(R20 Regulations applicable for the batches admitted from Academic Year 2020-21)

III SEMESTER

S.No.	Subject code	Subject	L	T	P	Credits
1	B20MA09	Numerical Methods and Complex Variables	3	1	0	4
2	B20EC03	Signals and Systems	3	0	0	3
3	B20EC04	Electronic Circuits Analysis	3	0	0	3
4	B20EC05	Switching Theory and Logic Design	3	0	0	3
5	B20EE10	Electrical Technology	3	0	0	3
6	B20EN01	English for Effective Communication	2	0	0	2
7	B20EC06	Electronic Circuits Analysis Lab	0	0	3	1.5
8	B20EC07	Electronic Simulation EDA Tools Lab	0	0	3	1.5
9	B20EC08	Project Based Learning-1	0	0	2	1
10	B20MC03	NSS/NCC	0	0	2	0
		Total Credits	**17**	**01**	**10**	**22**

IV SEMESTER

S.No.	Subject code	Subject	L	T	P	Credits
1	B20EC12	Pulse and Digital Circuits	3	0	0	3
2	B20EC13	Analog and Digital Communications	3	0	0	3
3	B20EC14	Electromagnetic Theory and Transmission Lines.	3	0	0	3
4	B20EC15	Probability Theory and Stochastic Process	3	0	0	3
5	B20EC16	Computer Organization	3	0	0	3
6	B20EC17	Pulse and Digital Circuits Lab	0	0	3	1.5
7	B20EC18	Analog and Digital Communications lab	0	0	3	1.5
8	B20EC19	Hardware Design Lab	0	0	2	1
9	B20EC20	Project Based Learning-2	0	0	2	1
		Total Credits	**15**	**00**	**10**	**20**

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V SEMESTER

S.No.	Subject code	Subject	L	T	P	Credits
1	B20EC23	Linear & Digital IC Applications	3	0	0	3
2	B20EC24	Digital Signal Processing	3	0	0	3
3	B20EC25	Control Systems	3	0	0	3
4	B20EC26 B20EC27 B20EC28	**Professional Elective-I** Electronic Measurements and Instrumentation Computer Networks Basic JAVA Programming	3	0	0	3
5	B20MB01	Managerial Economics & Financial Analysis	3	0	0	3
6	B20EC29	Linear & Digital IC Applications Lab	0	0	2	1
7	B20EC30	Digital Signal Processing Lab	0	0	3	1.5
8	B20EN03	Advanced English Communication skills lab	0	0	3	1.5
9	B20EC31	Project Based Learning-3	0	0	2	1
		Total Credits	**15**	**0**	**10**	**20**

VI SEMESTER

S.No.	Subject code	Subject	L	T	P	Credits
1	B20EC32	Microprocessors & Microcontrollers	3	0	0	3
2	B20EC33	VLSI Design	3	0	0	3
3	B20EC34	Antennas & Wave Propagation	3	0	0	3
4	B20EC35 B20EC36 B20EC37	**Professional Elective-II** Design of Fault Tolerant Systems Fiber Optical Communications Digital Image Processing	3	0	0	3
5	B20EC38 B20EC39 B20EC40	**Professional Elective-III** Radar Systems Speech Processing Machine learning	3	0	0	3
6	B20EC41	VLSI & e-CAD Lab	0	0	2	1
7	B20EC42	Microprocessors & Microcontrollers Lab	0	0	2	1
8	B20EC43	Project Based Learning-4	0	0	2	1
9	B20MC05	Logical Reasoning and Quantative Aptitude	2	0	0	0
		Total Credits	**15**	**0**	**6**	**18**

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VII SEMESTER

S.No.	Subject code	Subject	L	T	P	Credits
1	B20EC44	Microwave Engineering	3	0	0	3
2	B20EC45	Embedded Systems	3	0	0	3
3	B20EC46 B20EC47 B20EC48	**Professional Elective-IV** Wireless and Mobile Communication CMOS Circuit Design Artificial Intelligence	3	0	0	3
4	B20EC49 B20EC50 B20EC51	**Professional Elective-V** Sensor Networks Satellite Communication Robotics and Automation	3	0	0	3
5		Open Elective – I	3	0	0	3
6	B20EC52	Microwave Engineering Lab	0	0	2	1
7	B20EC53	Embedded Systems Lab	0	0	2	1
8	B20EC54	Mini Project & Internship	0	0	0	2
9	B20EC55	Project Phase – I	0	0	8	4
		Total Credits	**15**	**0**	**12**	**23**

VIII SEMESTER

S.No.	Subject code	Subject	L	T	P	Credits
1	B20EC56 B20EC57 B20EC58	**Professional Elective-VI** Digital Signal Processor & Architecture FPGA Architecture & Applications Internet of Things	3	0	0	3
2		Open Elective – II	3	0	0	3
3		Open Elective – III	3	0	0	3
4	B20EC59	Technical Seminar	0	0	2	1
5	B20EC60	Project Phase – II	0	0	16	8
		Total Credits	9	0	18	18

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B.TECH. ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE
(R20 Regulations applicable for the batches admitted from Academic Year 2020-21)

R20 B.Tech list of open electives. (Applicable form 2020-2021 admitted batch)

S.No.	Subject code	Subject	L	T	P	Credits	Offered Dept
1	B20CE55	Disaster Preparedness & Planning Management	3	0	0	3	CIVIL
2	B20CE56	Environmental Management	3	0	0	3	CIVIL
3	B20CE57	Urban Planning	3	0	0	3	CIVIL
4	B20EE54	Electrical Power Utilisation and Safety	3	0	0	3	EEE
5	B20EE55	Concepts of Control systems	3	0	0	3	EEE
6	B20EE56	Renewable Energy Sources	3	0	0	3	EEE
7	B20ME59	Non-Conventional Energy Sources	3	0	0	3	MECH
8	B20ME45	Robotics	3	0	0	3	MECH
9	B20ME33	Mechatronics	3	0	0	3	MECH
10	B20EC37	Digital Image Processing	3	0	0	3	ECE
11	B20EC46	Wireless and Mobile Communication	3	0	0	3	ECE
12	B20EC49	Sensor Networks	3	0	0	3	ECE
13	B20EC61	Biomedical Instrumentation	3	0	0	3	ECE
14	B20CS19	Data base Management Systems	3	0	0	3	CSE
15	B20CS12	Java Programming	3	0	0	3	CSE
16	B20CS55	Introduction to Network Security	3	0	0	3	CSE
17	B20CS56	Introduction to Cloud Computing	3	0	0	3	CSE
18	B20CS37	Internet of Things	3	0	0	3	CSE
19	B20CS04	Data Structures and Algorithms	3	0	0	3	CSE
20	B20AI03	Artificial Intelligence	3	0	0	3	CSE(AI&ML)
21	B20AI29	Introduction to Machine Learning	3	0	0	3	CSE(AI&ML)
22	B20AI30	Neural Networks	3	0	0	3	CSE(AI&ML)
23	B20AI31	Introduction to Cyber Security	3	0	0	3	CSE(AI&ML)
24	B20DS24	Introduction to Data science	3	0	0	3	CSE(DS)
25	B20DS25	Data Handling and Visualization	3	0	0	3	CSE(DS)
26	B20DS26	Introduction to Big Data	3	0	0	3	CSE(DS)
27	B20DS27	Introduction to Computer Forensics	3	0	0	3	CSE(DS)
28	B20MB02	Management Science	3	0	0	3	MBA
29	B20MB03	Entrepreneurship Development	3	0	0	3	MBA
30	B20MB06	Intellectual Property Rights	3	0	0	3	MBA

Note: Students should take open electives from the list of open electives offered by the other departments/branches only.

VAAGDEVI COLLEGE OF ENGINEERING
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LINEAR ALGEBRA & CALCULUS

B. TECH- I Semester **L/T/P/C**
3/1 /0 /4

Pre-requisites: None

Course Objectives:

To learn

- Concept of rank of matrix and apply to find the consistency of system of linear equations.
- To determine Eigen values, Eigen vectors of matrices.
- Analyze the nature of sequence and series.
- Geometrical approach to the mean value theorems and their applications.
- To find extreme value of function of two and three variables.

UNIT-I

Matrices: Types of Matrices: Symmetric, Skew-symmetric, orthogonal, Hermitian,Skew-Hermitian, Unitary matrices, Rank of a matrix by Echelon form and Normal form, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations.

UNIT-II

Eigen Values and Eigen vectors: Linear Transformation and Orthogonal Transformation: Eigen values, Eigen vectors and their properties, Diagonalization of a matrix, Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem;

UNIT-III

Sequences and Series: Definitions, limit, Convergent, Divergent and Oscillatory sequences and Series. Comparison test, p-test, D-Alembert's ratio test; Cauchy's Integral test; Cauchy's n^{th} root test. Alternating series: Leibnitz test, Absolute and Conditionally Convergence.

UNIT-IV

Calculus: Mean value theorems: Rolle 's Theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's mean value Theorem. Taylor's Series. Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT-V

Multivariable calculus (Partial Differentiation and applications): Definitions of Limit and continuity. Partial Differentiation, Total derivative; Jacobian, Functional dependence and independence, Maxima and Minima of functions of two and three variables using method of Lagrange's method of undetermined multipliers.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 42nd Edition, 2012.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley& Sons, 2006.
3. T.K.V. Iyengar, Engineering Mathematics-I, S. Chand, 2018.

References:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

Course Outcomes:

On successful completion of this course, students will be able to:

CO1: Understand the principles of matrix to calculate the characteristics of system of linear equations using multiple methods.
CO2: Determine Eigen values, Eigenvectors of matrices.
CO3: Analyse the nature of sequence and series to identify the convergence.
CO4: Evaluate limits of single-variable functions graphically and computationally.
CO5: Calculate Partial derivatives, extreme of functions of multiple variables.

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VAAGDEVI COLLEGE OF ENGINEERING
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PROGRAMMING FOR PROBLEM SOLVING

B. TECH- I Semester **L/T/P/C**
4/0 /0 /4

Pre-requisites: None

Course Objectives:

- To provide the necessary knowledge on general engineering problem solving methodologies.
- To provide necessary foundations for step by step computer program development and to present the basic concepts in C programming language.
- To prepare the students to write modular and readable C Programs.
- The Course introduces the essential concepts like abstract data types, user defined data types.
- To analyze the performance of algorithms and how to use such knowledge for later processing with the help of files.
- Aims to train the students to write working programs to solve problems.

Unit -I

Introduction: Steps in Problem Solving, Algorithms, Flowcharts, Pseudo code, Types of Programming Languages, Introduction to C, History of C, Structure of a C Program.

Introduction to C Programming: The C Character Set, Identifiers and - Keywords, Data Types, Constants and Variables, Declarations, Expressions & Statements, Input / Output Statements (Formatted and Unformatted), Creating and Running a C program.

Operators and Expressions : Unary Operators, Arithmetic Operators, Relational and Logical Operators, Assignment Operators, Conditional operator, Bitwise Operators, special operators, Precedence & Associativity, Type Casting and Type Conversion.

Unit – II

Control Statements: Branching Statements – if, if-else, else- if, nested-if. Switch statement. Un - conditional Branching Statement- goto. Looping Statements- while, do-while, for, nested loops. Break & Continue.

Functions : Introduction, Defining a Function, Types of Functions, Accessing a Function, Function Prototypes, Passing Arguments to a Function – call by value, Recursion.

Storage Classes: Automatic Variables, External (Global) Variables, Static Variables, Register.

Unit – III

Arrays: Definition - Single Dimensional Arrays, Multi Dimensional Arrays, Declaration, Initialization, Reading & Writing elements in to an Array, Passing Arrays to Functions. Linear Search, Binary search, Bubble sort.

Strings: Declaration and Initialization of Strings, Reading and Writing a String, String Manipulation Functions, String as Array of Characters, Array of strings, Sorting of Strings.

Structures and Unions: User-Defined Data Types, Defining a Structure, Processing a Structure, Array of Structures, Nested Structures, Passing Structures To Functions.
Unions. Typedef, Enumerated types - enum.

Unit – IV

Pointers: Introduction, Pointer Declarations, Pointer to Pointer, Operations on Pointers -Pointer Arithmetic, Dynamic Memory Allocation – Malloc(), Calloc(), Realloc(), Free(). Pointers and Functions - call by Reference, Pointers and Arrays (one dimensional, two dimensional), Array of Pointers. Structures and Pointers, Self-Referential Structures.

Unit- V

File Handling: Introduction, Text Files and Binary Files, File Handling Functions-Opening and Closing a File, File Opening Modes, Reading and Writing a File. Random Access File Functions – fseek() , rewind(), ftell(). Command Line Arguments, C Preprocessor Directives.

Text Book:

1. Byron Gottfried, **"Programming with C"** . Third Edition(Schaum's Outlines) McGraw Hill.

Reference Books:

1. B.A. Forouzan and R.F. Gilberg ,"C Programming and Data Structures" , Cengage Learning (3rd Edition)
2. Pradip Dey & Manas Ghosh, "Programming in C", 2nd Edition , Oxford University Press,2013.
3. E. Balaguruswamy , "Programming in ANSI C " ,McGraw-Hill Education, 2008.

Course Outcomes:

CO1: Understanding how problems are posed and how they can be analyzed for obtaining solutions.
CO2: Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
CO3: Implementing different operations on arrays and creating and using of functions to solve problems.
CO4: Understanding and exploring the various methods of memory allocations.
CO5: Ability to design and implement different types of file structures using standard methodology.

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VAAGDEVI COLLEGE OF ENGINEERING
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MODERN PHYSICS

B. TECH- I Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To provide sufficient depth in the concepts of Quantum mechanics and their applications
- To impart a thorough knowledge in Wave optics for engineering applications.
- To enrich the fundamental concepts and working principles of lasers in advancement of technology and research.
- To understand the concepts in semiconductor physics to develop various devices
- To study the concepts , working principles of optical fibres and their applications in various fields

Unit I

Quantum Mechanics

Introduction to Quantum mechanics, Waves and Particles, de-Broglie's hypothesis, Davisson and Germer's Experiment, Uncertainty principle, Time- Independent Schrodinger equation, Significance of Wave function, Particle in one dimension box.

Unit II

Wave Optics

Introduction to wave optics, Huygens's principle, superposition of waves, interference of light by division of wave front and division of amplitude; Thin film interference due to reflected light, Newton's rings (qualitative). Farunhofer diffraction due to a single slit, double slit and circular aperture, Diffraction gratings and their resolving power

Unit III

Lasers

Characteristics of lasers, Interaction of light with matter (absorption, spontaneous emission, stimulated emission). Relation between Einstein's Coefficients; Principle and working of lasers, population inversion, Pumping mechanism, Types of Lasers- Ruby laser, He-Ne laser, CO_2 laser and semiconductor diode laser, applications of lasers in the field of science, Engineering and Medicine.

Unit IV

Physics of Semiconductors and devices

Classification of materials: conductors, semi- conductors and insulators, calculation of carrier concentration in intrinsic and extrinsic (N-type) semiconductors, carrier generation and recombination, Direct and indirect band gap semiconductors. Formation of P-N junction, Energy diagram of P-N diode, LED, Types of semiconductor photo detectors, working principles and characteristics of PIN diode, Solar Cell.

Unit V

Optical Fibres

Introduction, principle behind optical fibres, Acceptance angle and Cone, Numerical aperture, Types of Optical Fibres, step and graded index fibres, losses in optical fibres, applications of optical fibres.

Text Books:

1. A Text Book of Engineering Physics, Dr. M.N. Avadhanulu, Dr. P.G. Kshrisagar-S.Chand.
2. Modern Engineering Physics (Vol-I & II), Dr. K. Vijaya Kumar, Dr. S. Chandralingam – S.Chand.
3. Engineering Physics, P.K.Palani Swamy, Scitech Publications.
4. Electric Devices & Circuits – Millman&Halkies.

References Books:

1. Haliday and Resnick, Physics-Wiley
2. J. Singh Semiconductor Optoelectronics: Physics and Technology, Mc. Graw-Hill inc(1995).

Course Outcomes:

On successful completion of this course, students are able to:

CO1: Understands the basic principles and hypothesis of quantum mechanics

CO2: Analyze and apply the concepts of wave optics for accurate determination of the interference in thin films, Newton's rings and the diffraction in single slit etc.

CO3: Describes the characteristics and working of lasers and their applications in various fields.

CO4: Classify the materials on the basis of energy band gap, and evaluates the carrier concentration of given semiconductors for device applications

CO5: Apply the concepts of the light propagation in optical fibres in optical communication systems

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VAAGDEVI COLLEGE OF ENGINEERING
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CHEMISTRY

B. TECH- I Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
- To acquire the knowledge of electrochemistry, different batteries.
- To acquire the knowledge of corrosion and it's control methods which are essential for the Engineers and in industry.
- To acquire the knowledge of water treatment which is essential for the Engineers in industry.
- To acquire the knowledge of resistors and capacitors.
- To acquire the skills and knowledge to organic reactions and importance of polymers in engineering and everyday life.

Unit I Electrochemistry & Batteries

Introduction to electrochemistry, conductance-specific, equivalent and molar conductance, units and their relation. Electrochemical and Electrolytic cells, Galvanic cell, measurement of e.m.f. and single electrode potential, Nernst's equation and its applications, Electro chemical series-applications.
Batteries: primary cells-lithium cells. Secondary cells – Pb-acid storage cell, lithium-ion cells, Fuel cells-hydrogen-oxygen fuel cell. Methanol-oxygen fuel cell-advantages and applications, Reserve batteries - silver peroxide-zinc alkaline cell.

Unit II Water Technology

Introduction, types of hardness, units and Numerical problems. Estimation of hardness of water-EDTA method. Boiler troubles-scales and sludges. Treatment of Boiler feed water-Ion-exchange process. De-salination of brackish water-Reverse Osmosis. Domestic water treatment-specifications and steps involved in the treatment of potable water.

Unit III Corrosion & It's Control Methods

Corrosion: Introduction, causes of corrosion, types of corrosion-dry and wet corrosion-mechanism of electrochemical corrosion. Caustic embrittlement and boiler corrosion. Factors affecting on corrosion and corrosion control methods- cathodic protection (sacrificial anodic protection and impressive current cathodic protection) and surface coatings (anodic and cathodic), Methods of application of metal coatings-Hot dipping (galvanization and tinning) and electroplating of copper.

Unit IV Polymers

Polymers: Introduction to polymers, classification of polymers, mechanism of free radical addition polymerization, properties of polymers-crystalline, melting point, boiling point and glass transition temperature. Conducting polymers-classification, mechanism of conduction in conducting polymers-poly acetylene and ploy aniline, applications.

Unit VChemistry of Passive Devices

Resistors: Types of resistors, colour codes, composition resistors-carbon resistor, film type resistor, wire -wound resistor**.**

Capacitors: Electrolytic capacitors family tree, Charge principle, Basic materials and construction.

Suggested Reading:

1. Text book of Engineering Chemistry by Jain & Jain.
2. Text book of Engineering Chemistry, CENGAGE learning by Prasanta Rath, B. Ramadevi, Ch. Venkata
3. Ramana Reddy & Subhendu Chakroborty.
4. University chemistry, by B. H. Mahan
5. Engineering Chemistry by Shashi Ch

Course Outcomes:

The basic concepts included in this course will help the student to gain:

CO1: The knowledge of electrochemical cells, different batteries

CO2: The required principles and concepts of corrosion, control methods.

CO3: The knowledge of water treatment.

CO4: The knowledge of polymers and their importance in day to day life.

CO5: The required principles and concepts of passive devices.

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VAAGDEVI COLLEGE OF ENGINEERING
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ENGINEERING DRAWING

B. TECH- I Semester **L/T/P/C**
0/0 /4 /2

Pre-requisites: None

Course Objectives:

- Use of various command, object properties in AUTOCAD.
- Learn the basic convention of drawings, dimensioning, scales and conic sections like ellipse, parabola and hyperbola.
- Learn projection of points, lines viewed in different positions.
- Learn projections of plane surfaces and solids viewed in different positions.
- Gain knowledge of sections of solids and their usage in real time applications and conversion of orthographic projection to isometric projection vice-versa.

Unit I

Chapter-I Introduction to Computer Graphics: Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software -The Menu System, Toolbars Standard, Object Properties, Draw, Modify and Dimension.

Chapter-II Introduction to Engineering Drawing:

Principles of Engineering Graphics and their significance, ISO and ANSI standards for coordinate dimensioning- usage of Drawing instruments, lettering

a. Conic sections including the Rectangular Hyperbola (General method only);
b. Roulettes-Cycloid, Epicycloid, Hypocycloid
c. Involute
d. Scales – Plain, Diagonal and Vernier Scales.

Unit II

Principles of Orthographic Projections in First Angle Projection- Conventions

Projections of Points

Projection of lines: Parallel, Perpendicular inclined to one plane and inclined to both the planes.

Unit-III

Projection of planes: Plane parallel, perpendicular and inclined to one reference plane. Planes inclined to both the reference planes.

Projection of Regular Solids-Projection of regular solids, Cube, prisms, pyramids, tetrahedron, Cylinder and cone, axis inclined to one plane and both planes, Projections of Regular Solids.

Unit-IV

Projections of Sections and sectional views of right angular solid-Prism, Cylinder, Pyramid, Cone.

Development of surfaces of Right Regular Solids – Prism, Pyramid, Cylinder and Cone.

Unit-V

Isometric Projections:

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric views to Orthographic views and Vice-versa, Conventions.

Text Books:

1. Agrawal B & Agrawal C.M. (2012), Engineering Graphics, TMH Publications.
2. Bhatt N.D., Panchal V.M. & Ingke P.R., (2014), Engineering Drawing, Charotar Publishing House.

References:

1. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, SciTech Publishers.
2. (Corresponding set of) CAD Software Theory and User Manuals.
3. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
4. Engineering Drawing – P.J.Shan S.Chand Publishers.
5. Engineering Drawing – Johle/Tata McGraw Hill Book Publishers.

Course Outcomes:

On successful completion of this course, students are able to:

CO1: Understand various commands, modify the applications and object properties in AUTOCAD

CO2: Analyze the Projections of Points and solids

CO3: Estimate the use of drawings, dimensioning, scales and conic sections

CO4: Compare the Conversion of Isometric views to Orthographic views

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VAAGDEVI COLLEGE OF ENGINEERING
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PHYSICS LAB

B. TECH- I Semester **L/T/P/C**
0/0 /3 /1.5

Pre-requisites: None

Course Objectives:

The laboratory course will develop student's knowledge in/on...

- Determination of frequency of AC supply by Sonometer
- Determination of the wavelengths, slit widths with high degree of accuracy from diffraction phenomena using conventional light and laser light
- Determination of time constant of RC circuit and optical fibre characteristics.
- Determination of Solar cell, LED and LASER diode etc. characteristics
- Determination of the wavelength and radius of curvature of Plano convex lens using Newton's rings

Name of the Experiment

1	Torsional Pendulum- Determination of rigidity modulus of materials of a wire
2	Determination of energy gap of material of a p-n junction
3	Study of LED diode V-I & P-I characteristics
4	Determination of dispersive power of a material of a prism-spectrometer.
5	Bending losses of optical fibres and evaluation of numerical aperture of a given optical fibre
6	Study of decay charge & determination of time constant of RC circuit
7	Study of characteristics of Solar cell
8	Determination of wavelength of laser source- Diffraction grating
9	Determination of frequency of AC supply - Sonometer
10	Study of LASER diode V-I & L-I characteristics
11	Determination of wavelength and radius of curvature of Plano convex lens using Newton Rings Experiment.
12	Study of P-N diode Characteristics.

Course Outcomes:

On successful completion of this Lab, students are able to:

CO1: Estimate the frequency of tuning for and AC supply with the help of stretched strings
CO2: Analyze as well as compare the intensity distribution of interference and diffraction patterns
CO3: Draw the characteristics of electrical and electronic circuits and evaluate the dependent parameters
CO4: Explore and understand the applications of semiconducting devices
CO5: Evaluates the wavelength and radius of curvature of Plano convex lens by Newton's rings

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROGRAMMING FOR PROBLEM SOLVING LAB

B. TECH- I Semester **L/T/P/C**
0/0 /3 /1.5

Pre-requisites: None

Course Objectives:

- To provide the necessary knowledge on general engineering problem solving methodologies.
- To provide necessary foundations for step by step computer program development and to present the basic concepts in C programming language.
- To prepare the students to write modular and readable C Programs.
- The Course introduces the essential concepts like abstract data types, user defined data types.
- To analyze the performance of algorithms and how to use such knowledge for later processing with the help of files.
- Aims to train the students to write working programs to solve problems.

WEEK-1

1. a) Write a C program to find the areas of shapes like circle, square, rectangle and triangle

1.b) write a C program to demonstrate Type Casting and Type Conversion.

WEEK-2

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

2. b) Write a C program to find greatest of any 3 numbers.

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

WEEK-3

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

3. b) A positive integer d is said to be a factor of another positive integer N if when N is divided by d, the remainder obtained is zero. For example, for number 12, there are 6 factors 1, 2, 3, 4, 6, 12. Every positive integer k has at least two factors, 1 and the number k itself. Given two positive integers N and k, write a program to print the k^{th} largest factor of N.

Input Format: The input is a comma-separated list of positive integer pairs (N, k).

Output Format: The k^{th} highest factor of N. If N does not have k factors, the output should be 1.

Constraints:

- 1<N<10000000000
- 1<k<600.

You can assume that N will have no prime factors which are larger than 13.

Example

- **Input**: 12,3
- **Output**: 4

3.c) Write a C program to find the second largest number in a set of n numbers.

WEEK-4

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

4. b) Write a C program to find the LCM(Least Common Multiple) and GCD (greatest common divisor) of two given integers.

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

WEEK-5

5.a) Write a C program to find sum of series 1+x^1+x^2+x^3+.....+x^n using functions.

5. b) Write a C program to find factorial of a given number using Recursion.
5. c) Write a C program to demonstrate the use of Storage Classes

WEEK-6

6. a) Write a C program to find both the largest and smallest number in a list of integers.
6. b) N monkeys are invited to a party where they start dancing. They dance in a circular formation, very similar to a Gujarati Garba or a Drum Circle. The dance requires the monkeys to constantly change positions after every 1 second.

The change of position is not random & you, in the audience, observe a pattern. Monkeys are very disciplined & follow a specific pattern while dancing.

Consider N = 6, and an array monkeys = {3, 6, 5, 4, 1, 2}.

This array (1-indexed) is the dancing pattern. The value at monkeys[i], indicates the new of position of the monkey who is standing at the ith position.

Given N & the array monkeys[ ], find the time after which all monkeys are in the initial positions for the 1st time.

Constraints

1<=t<=10 (test cases)

1<=N<=10000 (Number of monkeys)

Input Format

First line contains single integer t, denoting the number of test cases.

Each test case is as follows -

Integer N denoting the number of monkeys.

Next line contains N integer denoting the dancing pattern array, monkeys [].

Output

t lines,

Each line must contain a single integer T, where T is the minimum number of seconds after which all the monkeys are in their initial position

6.c) Write a C program to insert an element at a given position in an Array using functions.

WEEK-7

7. Write a C program to perform all of the following:
   a) Matrix Addition and subtraction
   b) Matrix Multiplication
   c) Find Transpose and test if a matrix is symmetric or not
   d) A traditional chess board consists of 8 rows and 8 columns. Write a program to count the number of safest places that a King can be positioned when 3 queens (ministers) are placed at different positions on the chess board.

WEEK-8

8. a) Write a C program to perform linear search
8. b) Write a C program to perform binary search
8. c) Write a C program to sort the elements using bubble sort

WEEK-9

9. a)Write a C program to insert a sub-string in to a given main string at a given position.
9. b) Write a C program to count number of characters, words and sentences in a given text.
9. c) Write a C program to determine if the given string is a palindrome or not.
9. d) Write a C program to sort the given names in alphabetical order.

WEEK-10

10. a) Write a C program to implement array of structures.(use student structure) and write functions to
    i. to search student data using hall ticket number.
    ii. to sort the student records based on the total marks.

10. b) Write a menu driven C program that uses functions to perform the following operations on complex numbers stored in a structure:

i.Reading a complex number

ii.Writing a complex number

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

10. c) Write a C program to demonstrate Unions and enum.

WEEK-11

11.a) Write a C program for Pointer Arithmetic.
11.b) Write a C program to swap two numbers using Call by value and Call by reference.
11.c) Write a C program to demonstrate calling of a function (like add, subtract, multiply) using a function pointer.

WEEK-12

12.a) Write a C program using pointer to create a two dimensional matrix, to input values in to the matrix and to display the matrix and its transpose. Free the memory properly.
12.b)Write a C program to demonstrate on structures and pointers.
12.c) Write a C program for dynamic creation of structures using pointers

WEEK-13

13.a)Write a C program to count no of alphabets, no of digits, no of special symbols, no of white spaces and no of tabs in a given text file.

13.b) Write a C program which copies one text file to another text file and verify the correctness.
13.c) Write a C program which copies one binary file to another binary file and verify the correctness.

WEEK-14

14.a) Write a C program to produce reverse of the content of a text fie into another text file and verify the result.
14.b) Write a C program to merge two text files into a third text file (i.e., the contents of the first file followed by those of the second are put in the third file) and verify the correctness.

WEEK-15

15.a) Write a command-line C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)
15.b)Write a C Program that removes all comment lines from a C source file.

Text Book:

1. Byron Gottfried, **"Programming with C"** . Third Edition(Schaum's Outlines) McGraw Hill.

Reference Books:

1. B.A. Forouzan and R.F. Gilberg ,"C Programming and Data Structures" , Cengage Learning (3rd Edition)
2. Pradip Dey & Manas Ghosh, "Programming in C", 2nd Edition , Oxford University Press,2013.
3. E. Balaguruswamy , "Programming in ANSI C " ,McGraw-Hill Education, 2008.

Course Outcomes:

On successful completion of this course, students are able to:

CO1: Understand basic structure of the C Programming, data types, declaration and usage of variables, control structures and all related concepts.
CO2: Ability to understand any algorithm and Write the C programming code in executable form.
CO3: Implement Programs using functions, pointers and arrays, and use the pre-processors to solve real time problems.
CO4: Ability to use file structures and implement programs on files.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DIFFERENTIAL EQUATIONS & VECTOR CALCULUS

B. TECH- II Semester **L/T/P/C**
3/1 /0 /4

Pre-requisites: None

Course Objectives:

To learn

- Methods of solving the applications of differential equations.
- To solve initial value problems using differential equations.
- Evaluation of multiple integrations and their applications
- The physical quantity involved in Engineering field related to vector field.
- To apply fundamental theorems of vectors integrations in their applications.

Unit I

Ordinary Differential Equations of First Order: Exact, Non-Exact differential equations, linear and Bernoulli's differential equations, Applications: Newton's law of cooling, Law of Natural growth and decay.

Unit II

Ordinary Differential Equations of Higher Order: Second order linear differential equations with constant coefficients, Non-Homogeneous terms of the type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax} V(x), Method of variation of parameters.

Unit III

Multivariable Calculus (Integration): Evaluation of Double Integrals (Cartesian and polar coordinates), Change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double.

Unit IV

Vector Differentiation: Vector point functions and scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Tangent plane and normal line. Scalar potential functions. Solenoidal and Irrotational vectors.

Unit V

Vector Integration: Line Integrals, Surface Integrals and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 42nd Editions, 2012.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. T.K.V. Iyengar, Engineering Mathematics-II, S. Chand, 2018.

References:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. Paras Ram, Engineering Mathematics, 2nd Edition, CBS Publishers
3. S.L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

Course Outcomes:

On successful completion of this course, students will be able to:

CO1: Apply the fundamental concepts of ordinary differential equations to real time problems.

CO2: Find the complete solution of a non homogeneous differential equations and applying its concepts in Engineering problems.

CO3: Evaluate the multiple integrals in various coordinate systems.

CO4: Apply the concepts of gradient, divergence and curl to formulate Engineering problems.

CO5: Analyse line, surface and volume integrals using fundamental theorems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

BASIC ELECTRONIC DEVICES
(common to ECE & EEE)

B. TECH- II Semester **L/T/P/C**
3/1 /0 /4

Pre-requisites: None

Course Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

- To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT,UJT and FET.
- To understand diode as a rectifier.
- To understand biasing of BJT.
- To study various types of filter circuits.

Unit I

P-N Junction Diode: Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), define Transition and Diffusion Capacitances, varactor diode, photo diode, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

Unit II

Rectifiers and Filters : The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Inductor Filters, Capacitor Filters, L- Section Filters,π- Section Filters, zener diode as a voltage regulator.

Unit III

Bipolar Junction Transistor: The Junction Transistor, Transistor Construction, BJT Operation, Transistor Current Components, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Transistor as an Amplifier, UJT construction and V-I characteristics.

Unit IV

Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE} and β, Fixed Bias, Voltage Divider Bias, Thermal Runaway, Thermal Stability.

Unit V

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

Text Books:

1. Millman's Electronic Devices and Circuits – J. Millman, C.C. Halkias, and Satyabrata Jit, 2 Ed.,1998, TMH.
2. Electronic Devices and Circuits – Mohammad Rashid, Cengage Learing, 2013
3. Electronic Devices and Circuits – David A. Bell, 5 Ed, Oxford University Press.

Reference Books:

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP.
4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Analyze the characteristics of the PN junction diode and Zener diode.

CO2: Design the rectifiers with and without filters for specified DC voltage.

CO3: Illustrate the voltage- current characteristics of Junction Transistor and different configurations of Transistor

CO4: Design and analyze the different biasing circuits and amplifier circuits.

CO5: Acquire knowledge about the construction, theory and characteristics of FET and MOSFET.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
ELECTRICAL CIRCUITS

B. TECH- II Semester **L/T/P/C**
3/0/0 /3

Pre-requisites: None

Course Objectives:

- Designs of this subject to students to have a firm grasp the basics of electrical circuits.
- Emphasis on the basic theorems & network reduction techniques of analysis which helps to develop the ability to design practical circuits used for real time applications.
- A comprehensive coverage topic on single-phase & three-phase AC circuits provides a quick understanding of the concepts underlying the electrical machines analysis.
- Understanding the behavior of networks containing R, L, & C elements, when they suddenly switched on to a source in several practical conditions.
- Detail average of topics relative to filters & attenuators emphasis the students to have best knowledge in electronics circuits.
- Study of 2-port networks in detail, helps the students to analyze the problems in electronic circuits & Signals..

Unit I

Introduction to Electrical Circuits: : Basic definitions, types of elements, types of sources, circuit components, ohm's law, Kirchhoff's laws, inductive networks, capacitive networks, and Network reduction techniques- series, parallel resistive networks and star to delta and delta to star transformation, Source transformation Mesh and Nodal analysis and Simple problems.

Network theorems: Superposition, Reciprocity, Thevenins's, Norton's, Maximum power transfer theorems and simple problems.

Unit II

Alternating Quantities: Principle of ac voltage waveforms and basic definition, root mean square and average value of alternating current and voltage, form factor and peak factor, Concept of reactance, Impedance, susceptance and admittance, Phase and phase difference phasor algebra of ac circuits, j-operator, singe phase series and parallel circuits, power in ac circuits, series and parallel Resonance, concept of Band width and Q-factor and illustrative Problems.

Unit III

Two-port networks: Z, Y, ABCD and H parameters, Conversion from one parameter to other parameters & their relations, Series, Parallel and Cascaded Networks, Characteristic impedance, Image Parameters and illustrative Problems.

Unit IV

Steady state and transient analysis: Steady state and transient analysis of series RL, RC & RLC Circuits and parallel RL, RC & RLC Circuits for DC and AC excitation and illustrative Problems.

Unit V

Filters: Classification of Filters, Filter Networks, Classification of Pass band and Stop band, Characteristic Impedance in the Pass and stop bands, Constant k Low Pass Filter, High Pass Filter m-derived T-Section Band Pass filter and Band Elimination filter illustrative Problems. Attenuators: Symmetrical Attenuators: T-Type Attenuator, Π (pi) Type Attenuator, Bridged T type Attenuator, Lattice Attenuator and illustrative Problems.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerlly McGraw Hill Company.
2. Circuits & Networks by A.Sudhakar and Shyammohan S .Palli, Tata McGraw Hill.
3. Electric circuits by A. Chakrabarthy, Dhanipat Rai & Sons.

References:

1. Network analysis by ME Van Valkenberg.
2. Engineering circuits analysis by C.L.Wadhwa, New Age International.
3. Electrical circuits by David A.Bell, Oxford University Press
4. Electric circuits theory by K.Rajeswaran, Pearson Education 2004.
5. Electrical Circuit Analysis by Roy Chowdhary

Course Outcomes:

After the course completion, the students are able to:

CO1: Learn basics of electrical circuits such as laws, transformation and network theorems and network reduction techniques.

CO2: Generate voltage and current waveforms for 3phase AC circuits and study the relationship between Voltage and current in star and delta connections

CO3: Analyze two port networks with ABCD parameters.

CO4: Analyze the steady state and transient operation of series and parallel RLC circuits

CO5: Classify various types for filters and attenuators and study their characteristics

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

BASIC PYTHON PROGRAMMING

B. TECH- II Semester **L/T/P/C**
3/0/0 /3

Pre-requisites: None

Course Objectives:

The purpose of the course is to make students

- To develop Python programs with conditionals and loops.
- To develop Python functions and call them.
- To develop and use Python data structures – lists, tuples, dictionaries.
- To do input/output with files in Python.
- To get exposure to various problems solving approaches of computer science

Unit I

Introduction to Python: What is Python?, What is Python Good For?, Python History, How does Python Execute a Program, Review of a Simple Program, Some of the Basic Commands, Variables, Statements, Input/Output Operations, Keywords, Variables, Assigning values, Standard Data Types, Strings, Operands and operators.

Unit II

Understanding the Decision Control Structures: The if Statement, A Word on Indentation, The if … else Statement, The if … elif … else Statement,

Loop Control Statements: The while Loop, The for Loop, Infinite Loops, Nested Loops.

The break Statement, The continue Statement, The pass Statement, The assert Statement, The return Statement.

Unit III

Functions- Function Definition and Execution, Scoping, Arguments: Arguments are Objects, Argument Calling by Keywords, Default Arguments, Function Rules, Return Values.

Advanced Function Calling: The apply Statement, The map Statement, Indirect Function Calls.

Unit IV

Lists: List, Creating List, Updating the Elements of a List, Sorting the List Elements. Storing Different Types of Data in a List, Nested Lists, Nested Lists as Matrices.

Tuples: Creating Tuple, Accessing the Tuple Elements, Basic Operations on Tuples, Functions to Process Tuples, Inserting Elements in a Tuple, Modifying Elements of a Tuple, Deleting Elements from a Tuple.

Sets: Creating Set, Basic Operations on Sets, Methods of Set.

Dictionaries: Operations on Dictionaries, Dictionary Methods, Using for Loop with Dictionaries, Sorting the Elements of a Dictionary using Lambdas, Converting Lists into Dictionary.

Unit V

Modules: Importing a Module, Tricks for Importing Modules, Packages.

Exceptions and Error Trapping: What is an Exception?, Exception Handling: try..except..else.., try..finally.., Exceptions Nest, Raising Exceptions, Built-In Exceptions.

Text Books:

1. The Complete Reference-Python by Martin C. Brown, Mc Graw Hill
2. Python Bible- Complete Python Language Reference by Dave Brueck and Stephen Tanner

Reference Books:

1. Python Programming for Beginners by Adam Stewart

2. Python Essential Reference (3rd Edition) by David M. Beazleyf

Course Outcomes:

CO1: Defining the fundamentals of writing Python scripts
CO2: Expressing the Core Python scripting elements such as variables and flow control structures
CO3: Apply Python functions to facilitate code reuse
CO4: Extending how to work with lists and sequence data
CO5: Adapting the code robust by handling errors and exceptions properly

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGLISH LANGUAGE AND INTERACTIVE COMMUNICATION SKILLS LAB

B. TECH- II Semester **L/T/P/C**
0/0/3 /1.5

Pre-requisites: None

The ELICS Lab focuses on the production and practice of sounds of language to familiarize the students with the use of English in everyday situations both in formal and informal contexts.

Course Objectives:

- To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning.
- To sensitize students to the nuances of English speech sounds, stress and intonation.
- To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking.
- To improve the fluency of students in spoken English and neutralize the influence of the sounds of their mother tongue.
- To train students to use language appropriately for public speaking and interviews.

English Language and Interactive Communication Skills Lab (ELICS) shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab
b. Interactive Communication Skills (ICS) Lab

Module - I

CALL Lab: Understand the essentials of English pronunciation through dialogues and conversations: Listening skill- its importance – purpose- process- types- barriers. Practice: introduction to phonetics – speech sounds – vowels and consonantal phonemes.

ICS Lab: Understand the practicalities in using English in formal contexts: Communication at workplace– spoken vs. written language. Practice: Ice-breaking activity and JAM session– situational dialogues – greetings – taking leave – introducing oneself and others.

Module - II

CALL Lab: Understand the fundamentals of English pronunciation though expressions used in day to day situations: Structure of syllables – word stress and rhythm– weak forms and strong forms in context. Practice: Basic rules of word accent – stress shift – weak forms and strong forms in context.

ICS Lab: Understand and practice non-verbal cues in various situations: Features of good conversation – non-verbal communication. Practice: Situational dialogues – roleplay– expressions in various situations – making requests and seeking permissions – telephone etiquette.

Module - III

CALL Lab: Understand the importance of e-correspondence: The basics– general format –drafting –features of good e-mails– do's and don'ts of e-mail etiquette. Practice: Assignments through e-mails observing e-mail etiquette.

ICS Lab: Apply the strategies of browsing to make effective oral presentations: Understanding text features, print features – collecting data needed for the presentation – how to make formal presentations. Practice: Formal presentations.

Module – IV
CALL Lab: Identify and differentiate audio text from the given source while listening to authentic material: Listening for general details about an event / object/ person or a piece of art. Practice: Listening descriptions / discussions / interpretations / comments/ analysis/ evaluations / summaries.

ICS Lab: Understand: Public speaking – exposure to structured talks. Practice: To make an academic talk – extempore.

Module – V
CALL Lab: Understand: Listening for specific details of a survey to fill up the survey sheet.
Practice: Listening to comprehension texts to understand the gist.

ICS Lab: Understand: Debate/group discussion based on contemporary topic/survey report, interview skills.
Practice: Mock group discussion/mock interviews.

Minimum Requirement of infrastructural facilities for ELICS Lab:
1. Computer Assisted Language Learning (CALL) Lab:
The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.
System Requirement (Hardware component): Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:
i) Computers with Suitable Configuration
ii) High Fidelity Headphones

2. Interactive Communication Skills (ICS) Lab:
The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public-Address System, an LCD and a projector etc.

References:
1. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford University Press.
2. Spoken English: A self-learning guide to conversation practice by V Sasikumar and P V Dhamija, Tata McGraw-Hill, 2008.
3. Fundamentals of English Grammar, Third Edition by Betty Schrampfer Azar, Barbara F. Matthies and Shelley Hartle, Longman.
4. Handbook for Technical Writing by David A Mc Murrey & Joanne Buckely CENGAGE Learning 2008.

Course Outcomes:
After the completion of this course, students will be able to –
CO1: Uunderstand the nuances of English language through audio-visual experience and group activities.
CO2: Speak with clarity and confidence which in turn enhances their employability skills.
CO3: Develop their listening skills so that they may appreciate its role in developing LSRW skills language and improve their pronunciation.
CO4: Involve the students in speaking activities in various contexts

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

BASIC ELECTRONIC DEVICES LAB
(Common to ECE & EEE)

B.Tech II Semester **L/T/P/C**
0 /0 /3 /1.5

Course objectives

- This course intends to provide an overview of the principles and operation of electronic components.
- To understand the operation of power supply circuits, rectifiers and voltage regulators.
- To understand the characteristics of the active devices.
- To understand the construction of simple electronic circuits.

Part A (For Laboratory Examination – Minimum of 8 experiments)

1. Forward & Reverse Bias Characteristics of PN Junction Diode
2. Zener diode characteristics & Zener voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration.
6. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
7. FET characteristics.
8. UJT characteristics.
9. Design of self bias circuit
10. Comparison of performance of self bias and fixed bias circuits.

Part B

Design of any simple real time circuits for example Doorbell, Water level indicator, Timer circuit, waveform generator etc..

Course Outcomes.

After completion of this course Student able

CO1: Demonstrate the characteristics and operation of Semiconductor diodes..
CO2: Analyze different rectifier circuits.
CO3: Demonstrate V-I characteristics of BJT, FET and UJT.
CO4: Design simple electronic circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

BASIC PYTHON PROGRAMMING LAB

B. Tech: II- Semester **L/T/P/C**
0/0/3/1.5

Course Objectives:

The purpose of the course is to make students

- To develop Python programs with conditionals and loops.
- To develop Python functions and call them.
- To develop and use Python data structures – lists, tuples, dictionaries.
- To do input/output with files in Python.
- To get exposure to various problems solving approaches of computer science

Week 1:

a. Write a program to perform the arithmetic operators. Find out the student total marks and average
b. Write a program to apply type conversion techniques in python. Convert from string to int, int to float, float to string

Week 2:

a. Write a program to display whether a student passed in a single subject or not using if statement
b. Write a program to display the grade of a student based on the average of 3 subject marks using if-elif statement

Week 3:

a. Write a program to display the reverse of a given number using while loop and for loop
b. Write a program to display the factorial of a given number using while loop and for loop

Week 4:

a. Write a program to display the prime numbers between 2 and n using while loop and for loop
b. Write a program to print the average marks of 10 students using loops(input 3 subjects for each student)

Week 5:

a. Write a program to define a function to display the grade of a student by using positional arguments(rno, sub1,sub2,sub3)
b. Write a program to define a function to display total bill for a shopping by taking customer name and number of items as keyword arguments.

Week 6:

a. Write a program to define a function to calculate the area of a circle using default arguments
b. Write a program to display the reverse of a given number using recursive function.

Week 7:

a. Write a program to convert a decimal number to binary number using recursive function.
b. Write a program to perform the arithmetic operations using the functions to each opearation.(add(),sub(),mul(),div())

Week 8:

a. Write a program to perform bubble sort on a list without using the sort().
b. Write a program to display the elements of a list in reverse order without using the reverse()

Week 9:

a. Write a program to find a student name from the list of students
b. Write a program to perform addition of 2 matrices using nested lists

Week 10:

a. Write a program to perform multiplication of 2 matrices using nested lists
b. Write a program to demonstrate the tuple operations

Week 11:

a. Write a program to create a list and eliminate the duplicate values from the list
b. Write a program to crate 2 sets and perform union, intersection, set difference and symmetric difference operations on sets.

Week 12:

a. Write a program to create a students dictionary with the rno as key and a list as the values of a key (name,sub1,sub2,sub3) and display a memo with total, avg, result and grade
b. Write a program to create a package Shapes and perform the area calculation for different shapes(use one function for each shape)

Week 13:

a. Write a program to create a package Calculator and perform various arithmetic operations (use one function for each operation like add(),mul(),sub(),div())
b. Write a program to create module with packages like Shapes and Calculator and import the module into program, access the functions defined the in the module.

Week 14:

a. Write a program to create a file and save the details of a students (rno,name,sub1,sub2,sub3)
b. Write a program to open a file of students and display the students details in tabular format like rno,name,sub1,sub2,sub3,total,avg,result,grade

Week 15:

a. Write a program to demonstrate the variable not available exception

Week 16:

a. Write a program to demonstrate arithmetic exception
b. Write a program to create a lambda function to display whether a person is eligible for voting or not

Text Books:

1. The Complete Reference-Python by Martin C. Brown, Mc Graw Hill
2. Python Bible- Complete Python Language Reference by Dave Brueck and Stephen Tanner

Reference Books:

1. Python Programming for Beginners by Adam Stewart
2. Python Essential Reference (3rd Edition) by David M. Beazleyf

Course Outcomes:

CO1: Expressing the Core Python scripting elements such as variables and flow control structures.
CO2: Apply Python functions to facilitate code reuse.
CO3: Extending how to work with lists and sequence data.
CO4: Adapting the code robust by handling errors and exceptions properly.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING & IT WORKSHOP

B. Tech: II- Semester (common for ECE, EEE, CSE, CSD, & CSM) **L/T/P/C**
0/0/3/1.5

Pre-requisites: None

Course Objectives:

- Know the usage of various tools and their application in house wiring and Soldering.
- Identify a particular component from the given group of passive electronic components.
- Know the usage of various Voltage sources and equipment.
- Know the concepts of hardware and assemble and dissemble of computer.
- Know the installation of XP and Linux software.
- Overview of Microsoft word and table formats, Mail-merge concepts, Hyperlink concepts.
- Overview of Microsoft Excel, Functions and formulas.
- Overview of Microsoft PowerPoint , Slides creation, Layouts and insert images
- Overview of Microsoft Access , Creation of Tables , data base
- Information of data analysis functions and concatenate functions.

Unit I

Trades For Exercises:

1. House – wiring
2. Soldering

Unit II

Electronic Components and Equipments

1. Passive components: Different types of: resistors, inductors, capacitors, potentiometers, Thermistor, Transformers.
2. Active components: Diode, Zener diode, Varactor diode, LED, Photo diode, BJT, Photo transistor, FET, LDR, Solar cell, Photocell, Optocoupler.
3. Voltage Sources: DC battery,. AC power supply, DC power supply.
4. Measuring Instruments: Different types of Voltmeters, Ammeters, Multimeter, CRO, DSO and Function Generator.

Unit III

Introduction to Computers

Block diagram of computer – Memory functions of the CPU along with the configuration of each peripheral. Identify the peripherals of a computer, components in a CPU and its functions. Disassemble and assemble the PC back to working condition. Every student should individually install MS windows and Linux on the personal computer. Students should get connected to their Local Area Network and access the Internet.

Unit IV

Introduction to Ms Office

Overview of Microsoft Word, Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Mail-merge concepts. Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Overview of Microsoft Excel, Description about Spread Sheet, Gridlines, Format Cells, Summation, auto fill, Formatting Text, Cell Referencing, Filters, Formulae in excel – average, std deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function.

Overview of Microsoft PowerPoint, PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting – Images, Clip Art.
Overview of Microsoft Access, Creation of Tables, creation of data base, import or export the data base, hyperlinks to another tools.

Unit V
Data Analysis
Insert tables, Draw the column chart, Pie chart, Line chart, bar Diagrams and also insert Auto functions.
Data analysis functions: Concatenate, Len, Count of sell, sum if function, average if condition, find/search techniques, if error function, count ifs function.

Text Books:
1. Workshop Manual – P.Kannaiah / K.L.Narayana/Scitech Publishers.
2. Workshop Manual – Venkat Reddy/BS Publication / 6th Edition.

Course Outcomes:
CO1: Know the fundamental knowledge of House wiring and soldering and their usage in real time Applications.
CO2: Gain knowledge on electronic components and measuring instruments.
CO3: Use basic concepts of computer hardware for assembly and disassembly.
CO4: Use Microsoft tools for exercise.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

SPORTS

B. Tech: II- Semester **L/T/P/C**
0/ 0/ 0/ 0

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

NUMERICAL METHODS AND COMPLEX VARIABLES

B. TECH- III Semester **L/T/P/C**
3/1 /0 /4

Pre Requisites:

Course Objectives:

To learn

- The importance of numerical methods to identifying the root of an equation and finding its approximate value by different techniques.
- Solving initial value problems using numerical methods.
- Differentiation and integration of complex valued functions.
- Expansion of complex functions using Taylor's and Laurent's series.
- Evaluation of integrals using Cauchy's residue theorem

Unit I

Solutions of algebraic and transcendental equations: Introduction, Numerical solution of algebraic and transcendental equations by Bisection method, Regula-Falsi method, Newton-Raphson's method.

Unit II

Numerical Integration & solutions of ordinary Differential Equations:
Numerical Integration with Trapezoidal rule, Simpson's 1/3rd rule, Simpson's (3/8) rule Solutions of first order ordinary differential equations by Taylor's series, Euler's method, Euler's -modified method, Runge-kutta methods.

Unit III

Functions of Complex Variables: Limit, Continuity and Differentiability, Analyticity, properties. Cauchy-Riemann equations in Cartesian & polar coordinates (without proof), Harmonic and conjugate harmonic functions, Milne-Thompson method.

Unit IV

Complex Integration: Line integral, Cauchy's integral theorem, Cauchy's integral formula. **power series:** Taylors Series, Laurent's series, singular points, isolated singular point, pole of order m, essential singularity. (All Theorems without proof).

Unit V

Residue & Evaluation of Integrals: Residues, Cauchy's residue theorem (without proof), evaluation of real integrals: (a) $\int_0^{2\pi} f(sin\theta, cos\theta)\, d\theta$, (b) $\int_{-\infty}^{\infty} f(x)dx$, Bilinear transformation, fixed points, cross ratio properties, invariance of circles.

Text Books:

1. Higher Engineering Mathematics:B.S. Grewal, Khanna Publishers,36th Edition, 2010.
2. Introductory methods of numerical analysis:S.S. Sastry, PHI, 4th Edition, 2005.
3. Complex Variables and Applications:. W. Brown and R. V. Churchill ,7th Ed., Mc-Graw Hill, 2004.

References:

1. Numerical Methods for Scientific and Engineering Computations: M. K. Jain, SRK Iyengar, R.K. Jain, New Age International publishers.
2. Advanced Engineering Mathematics:Erwin kreyszig, 9th Edition, John Wiley & Sons,2006.
3. Fundamentals of Complex Analysis: Saff E.B and A.D snider Pearson.
4. Advanced Engineering Mathematics: Louis C.Barrett, Mc. Graw Hill.

Course Outcomes:

On successful completion of this course, students will be able to:

CO1: Find a better approximate root of a given equation using appropriate iterative method.
CO2: Evaluate the integration to solve the differential equations using numerical techniques.
CO3: Analyse the complex function with reference to their analyticity.
CO4: Expand the complex functions by using Taylor's and Laurent's series
CO5: Evaluate the real integrals and transforms the functions from one plane to another plane.

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VAAGDEVI COLLEGE OF ENGINEERING
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SIGNALS AND SYSTEMS

B. TECH- III Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objective:

- This is a core subject, basic knowledge of which is required by all the engineers. This course focuses on:
- To get an in-depth knowledge about signals, systems and analysis of the same using various transforms.

Unit I

Signal Analysis and Fourier Series Signal Analysis: Analogy between Vectors and Signals, Orthogonal Signal Space, Mean Square Error, Orthogonality in Complex functions, Concepts of Basic signals. Signum and Sinc function.
Introduction to MATLAB and generation of Basic signals using MATLAB

Unit II

Introduction to Fourier series: Representation of Fourier series, Continuous time periodic signals, Properties of Fourier Series, Dirichlet 's conditions, Trigonometric Fourier Series and Exponential Fourier Series.
Fourier Transforms: Deriving Fourier Transform from Fourier Series, Fourier Transform of arbitrary signal, Fourier Transform of standard signals, Fourier Transform of Periodic Signals, Properties of Fourier Transform, Introduction to Hilbert Transform, and implementation of Fourier transforms using MATLAB

Unit III

Laplace Transforms: Introduction to Laplace Transforms, Concept of Region of Convergence (ROC) for Laplace Transforms, Partial fraction expansion, Inverse Laplace Transform, Properties of L.T, Relation between L.T and F.T of a signal, Solution of Differential Equation Using Laplace Transform, and implementation of Laplace Transforms using MATLAB

Unit IV

Signal Transmission Through Linear Systems: Classification of Systems, Impulse response, Response of a Linear System, Linear Time Variant (LTV) System, Transfer function of a LTI system, Signal bandwidth, System bandwidth, Causality and Paley-Wiener criterion for physical realization, Relationship between Bandwidth and Rise time, and verification of linearity and time invariance of the systems using MATLAB

Unit V

Convolution and Correlation of Signals: Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Cross Correlation and Auto Correlation of functions, Properties of Correlation function, Energy density spectrum, Parseval 's Theorem, Power density spectrum, Relation between Auto Correlation function and Energy/Power spectral density function, Relation between Convolution and Correlation. Convolution and Correlation of signals using MATLAB.

Text Books:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.

Reference Books:

1. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2 Ed.
2. Signals and Systems – Iyer and K. Satya Prasad, Cengage Learning

3. Signals and Systems – A.Rama Krishna Rao – 2008, TMH.
4. Introduction to Signal and System Analysis – K.Gopalan 2009, Cengage Learning.
5. Fundamentals of Signals and Systems - Michel J. Robert, 2008, MGH International Edition.
6. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, 3 Ed., 2004, PE.

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Apply the knowledge of vectors, orthogonal basis to signals. Analyze the spectral characteristics of Continuous-time periodic signals using Fourier series.

CO2: Demonstrate and apply Fourier transform on various signals.

CO3: Apply the Laplace transform and Fourier transform for the analysis of continuous-time signals.

CO4: Analyze systems based on their properties and determine the response of LTI system.

CO5: Understand the concepts of convolution and correlation of signals.

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VAAGDEVI COLLEGE OF ENGINEERING
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ELECTRONIC CIRCUITS ANALYSIS

B. TECH- III Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Basic Electronic Devices

Course Objective:
To familiarize the student with
- The analysis and design of basic transistor amplifier circuits
- The frequency response characteristics of multistage amplifiers
- The characteristics of feedback amplifiers and classification of oscillators.
- The Efficiency of various power amplifiers and quality factor of tuned amplifiers.

Unit- I
Transistor Low Frequency Analysis: Two port devices and hybrid model – transistor hybrid model and h parameters - determination of h-parameters from the characteristics – Analysis of transistor amplifier using h-parameters, miller's theorem, design of single stage RC coupled amplifier using BJT. Effect of coupling and bypass capacitors. Low frequency FET model –Common source and Common drain amplifiers.

Unit II
Transistor High Frequency Analysis: Hybrid pi CE transistor model – Hybrid pi conductance and capacitances - CE short circuit current gain, CE transistor amplifier response. Gain - Bandwidth Product.
Multi Stage Amplifiers: Different Coupling Schemes used in Amplifiers – Cascaded RC Coupled Amplifier, Transformed Coupled Amplifier, Direct Coupled Amplifier, Cascode Amplifier, Darlington Pair.

Unit III
Feed Back Amplifiers: Concept of Feedback, Classification of Feedback Amplifiers, and General Characteristics of Negative Feedback Amplifiers, Effect of Feedback on Amplifier Characteristics, Voltage Series, Voltage Shunt, Current Series and Current Shunt Feedback Configurations, Illustrative Problems.
Oscillator: Classification of Oscillator, Conditions for Oscillations, Generalized analysis of LC oscillations - Hartley and Colpitts Oscillators, RC phase shift Oscillator, Wien - Bridge & Crystal Oscillators, Stability of Oscillators.

Unit IV:
Power Amplifiers: Classification, Class A Large Signal Amplifiers, Transformed Coupled Class A, Efficiency of Class A Amplifier, Class B Amplifier, Class - B Push - Pull Amplifier, Complementary Symmetry Class B Push - Pull Amplifier, Distortions in Power Amplifier, Thermal Stability and Heat Sinks.

Unit V:
Tuned Amplifiers: Introduction, Q - Factor, Small Signal Tuned Amplifier, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

Text Books :
1. Electronic circuits analysis and design by Donald A Neamen.
2. Electronic circuit analysis - S. Salivahan, N.Suresh Kumar, A Vallavaraj, 2 Ed., 2009, TMH.

References Books:
1. Electronic Devices and Circuits – Rashid Cengage Learning, 2013
2. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, 9 Ed., 2008 PE.
3. Micro Electronic Circuits – Sedra A.S. and K.C. Smith, Oxford University Press.
4. Electronic Circuit Analysis – K. Lal Kishore, BS Publications, 2004.

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Construct and analyze the Low frequency model of transistor and evaluate the h-parameters.

CO2: Analyze the single and multi stage amplifiers in high frequency region.

CO3: Design and construct the negative feedback amplifiers and oscillators according to the required specifications.

CO4: Determine the efficiencies of large signal amplifiers.

CO5: Compare and contrast various tuned amplifiers.

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VAAGDEVI COLLEGE OF ENGINEERING
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SWITCHING THEORY AND LOGIC DESIGN

B. TECH- III Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives:

This course provides in-depth knowledge of switching theory and the design techniques of digital circuits, which is the basis for design of any digital circuit. The main objectives are:

- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
- To implement simple logical operations using combinational logic circuits
- To design combinational logic circuits, sequential logic circuits.
- To impart the concepts of sequential circuits and to analyze sequential systems in terms of state machines.

Unit I

Number System and Boolean Algebra And Switching Functions: Review of number systems, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes.

Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Gates, Multilevel NAND/NOR realizations.

Unit II

Minimization and Design of Combinational Circuits: Introduction, the minimization of switching function using theorem, The Karnaugh Map Method-Up to Five Variable Maps, Don‘t Care Map Entries, Tabular Method, Design of Combinational Logic: Adders, Subtractors, comparators, Multiplexers, Demultiplexers, Decoders, Encoders and Code converters.

Unit III

Sequential Machines Fundamentals and Applications: Introduction of Sequential circuits, Latches, Flip Flops: SR, JK, Race Around Condition in JK, JK Master Slave, D and T Type Flip Flops, Excitation Table of all Flip Flops, Conversion from one type of Flip-Flop to another, Shift Registers, Applications of Shift Registers.

Unit IV

Sequential Circuits-I: Introduction, State Diagram, Analysis of Synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, synthesis of synchronous sequential circuits, serial binary adder, Sequence Detector, Parity-bit Generator, Design of Asynchronous & Synchronous Counters, Design of Synchronous Modulo N –Counters.

Unit V: Sequential Circuits-II:

Finite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines.

Text Books:

1. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rdEdition, Cambridge.
2. Switching Theory and Logic Design – A Anand Kumar, PHI,2013.

Reference Books:

1. Digital Design- Morris Mano, PHI, 3rd Edition.
2. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed, John Wiley & Sons Inc.
3. Digital Fundamentals – A Systems Approach – Thomas L. Floyd, Pearson, 2013.
4. Digital Logic Design - Ye Brian and HoldsWorth, Elsevier.
5. Fundamentals of Logic Design- Charles H. Roth, Cengage LEanring, 5th, Edition, 2004.
6. Digital Logic Applications and Design- John M. Yarbrough, Thomson Publications, 2006.
7. Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Utilize and explain the functionality of logic gates (AND, NAND, OR, NOR, XOR, XNOR, NOT).

CO2: Design different combinational circuits using minimization techniques.

CO3: Explain various flip flops and design various registers.

CO4: Analyze and design basic sequential circuits and counters.

CO5: Analyze and minimize completely specified and incompletely specified sequential machines.

VAAGDEVI COLLEGE OF ENGINEERING
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ELECTRICAL TECHNOLOGY

B. TECH- III Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives:

In this course it is aimed to introduce to

- Understand the magnetic circuit concepts
- Understand the functioning of different types of DC machines.
- Principle of operation and applications of Transformer.
- Understand the functioning and characteristics of 3-Phase Induction Motor
- Understand the operating principle and applications of AC machines

Unit I

Magnetic Circuits: – Faraday's laws of electromagnetic induction – concept of self and mutual inductance – dot convention – coefficient of coupling – Analysis of series and parallel magnetic circuits.

Unit II

D.C. Machines: Principle of operation – E.M.F Equation, Types of Generators, Magnetization and load characteristics of DC Generators. DC Motors: Types of DC Motors, characteristics of DC motors, Speed Control of DC Shunt Motor, Flux and Armature Voltage control methods.

Unit III

Transformers: Principle of Operation of Single Phase transformer, Types, Constructional Features, Phasor Diagram on No Load and Load, Equivalent Circuits, Losses and Efficiency of Transformer and Regulation, OC & SC tests.

Unit IV

Three Phase Induction Motor: Production of Rotating Magnetic Field, Constructional features, principle of operation, Torque Equation, Torque – Slip Characteristics, Applications.

Unit V

Synchronous Machines: Synchronous Generator and Motor: Constructional Features & Principle of Operation, Applications.

Single Phase Induction Motor: Production of Rotating Field in various types of 1-Phase Motors Split phase, Capacitor Start, Capacitor run, Shaded Pole motors and Applications.

Text Books:

1. Edward Hughes ―Electrical & Electronics Technology‖ 10th Edition, Pearson Education, 2010.

Reference Books:

1. M.S.Naidu&S.Kamakshaiah, ―Introduction to Electrical Engineering‖ Tata Mc Graw Hill Ltd, New Delhi.
2. B.L.Thereja, A.K. Thereja, ―Electronics Technology ―S.Chand& Company Vol 1 & Vol 2 Ltd 2005 Education.
3. Chakravarthy A. Sudhipanth and Chandan Kumar ―Basic Electrical Engg‖ Tata Mc Graw Hill Ltd, New Delhi.

Course Outcomes:

After the course completion, the students are able to

CO1: Study the basics of magnetic circuits and its analysis

CO2: Understand the principle of operation of DC machines and their applications

CO3: Analyze the construction, types, performance and its applications
CO4: Understand the rotating magnetic field, operation and characteristics
CO5: Understand the operation of AC machines

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGLISH FOR EFFECTIVE COMMUNICATION

B. TECH- III Semester **L/T/P/C**
2/0 /0 /2

Pre Requisites - None

Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students. In English classes, the focus should be on the skills development in the areas of vocabulary, grammar, reading and writing. The course follows an integrated approach to language teaching. Instructors and students are encouraged to use online, print media and electronic media resources in compliance with the course topics of the prescribed book and make the best use of worksheets, quizzes, presentations, discussions, role plays and assignments.

Course Objectives

The course will enable the students to -

- Understand types of reading for different purposes and practice a variety of texts in print and electronic format.
- Improve the language proficiency of students in English with an emphasis on vocabulary, grammar, reading and writing skills.
- Motivate students to study academic subjects more effectively and critically using the theoretical and practical components of English.
- Develop study skills and communication skills in formal and informal situations.

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Syllabus Content:

Unit I

Note Making Skills

- Listen to the audio texts on current issues by English speakers and make notes based on the audio text.
- Read the texts in printed format and make notes based on the text.
- Make notes for texts on scientific concepts.
- Read the excerpt, 'Inventors' and do the activities on skimming, scanning and information transfer.
- Vocabulary: Word formation – prefixes and suffixes.
- Grammar: Contracted forms of verbs, tense and aspects.

Unit II

Summarizing Skills

- Watch the given videos on current issues and summarize the information.
- Read the given texts in electronic format to summarize the information.
- Summarize the given texts / videos on scientific concepts by English speakers.
- Read the excerpt, 'War' and do the activities on summarizing, and vocabulary building.
- Vocabulary: Homonyms, homophones and homographs.
- Grammar: Subject-verb agreement.

Unit III

Mind Mapping Skills

- Use mind map techniques to read the text and infer the information using digital tools / through graphical representation.

- Read the excerpt, 'Aliens' and complete the activities on the reading passage.
- Vocabulary: One-word substitutes.
- Grammar: Articles.

Unit IV

Making Oral Presentations

- Train the students to prepare the drafts for the technical events and present to the class.
- Produce visuals using various digital tools for making effective oral presentation.
- Prepare the visuals, audio and text materials based on the four major components.
- Read the excerpt, 'Genetics' and make an oral presentation.
- Vocabulary: Abbreviations and acronyms.
- Grammar: Common errors in tenses.

Unit V

Drafting Skills

- Letter writing – types – parts - styles – format – appropriate language – model letters.
- Prepare the script for compering for various college events.
- Read the excerpt, 'Sports' and write an essay on the most favourite sport.
- Vocabulary: Technical vocabulary.
- Grammar: Common errors in English.

Textbooks:

1. English for Technical Communication by Sudarshana, N.P. and C. Savitha, Published by Cambridge University Press.

References:

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P. (2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
5. Hamp-Lyons, L. (2006). Study Writing. Cambridge University Press.

Digital tools for mind mapping activities

1. https://www.mindomo.com/
2. https://www.mindmeister.com/
3. https://www.ayoa.com/
4. https://coggle.it/
5. https://www.popplet.com/

Digital tools for the activities on oral presentation

1. https://prezi.com/
2. https://www.clearslide.com/product/presentations/
3. https://wideo.co/
4. https://slidebean.com/
5. https://www.canva.com/
6. https://docs.google.com/presentation/u/0/
7. https://www.powtoon.com/

Course Outcomes

After completing this course, students will be able to -

CO1: Skim and scan the digital text to summarize it for future reference.
CO2: Read the text to make notes according to their needs.
CO3: Use English language effectively in spoken and written forms.
CO4: Communicate confidently in various contexts and different cultures.
CO5: Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

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VAAGDEVI COLLEGE OF ENGINEERING
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ELECTRONIC CIRCUITS ANALYSIS LAB

B. TECH- III Semester **L/T/P/C**
0/0 /3 /1.5

Pre Requisites: Basic Electronic Devices Lab

Course objectives:
- To introduce the operational principle, models and the analysis of Single stage amplifier circuits
- To study the operational principle and analysis of multi stage amplifiers
- To study the operational principle and analysis of power amplifiers.
- To introduce various oscillator Circuits

List of Experiments (12 experiments to be done):

Part - I: Electronic Circuits
Minimum eight experiments to be conducted:
I) Design and Simulate using any Simulation Software.
1. Common Emitter Amplifier.
2. Common Source Amplifier.
3. Two Stage RC Coupled Amplifier
4. Current shunt Feedback Amplifier
5. Cascode Amplifier.
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. Common base (BJT) / Common gate(JFET) Amplifier.

II) Testing in the Hardware Laboratory (Minimum 4 Experiments):
1. Class A Power Amplifier (with transformer load)
2. Class C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley Oscillators
5. Colpitt's Oscillators
6. Darlington Pair
7. Any feedback amplifier.

Course Outcomes:
After the completion of this course, the students should be able to:
CO1: Understand the concept of multistage amplifiers, analysis of multistage amplifier and plot frequency response.
CO2: Design, construct and test amplifier circuits and interpret the results.
CO3: Operate electronic test equipment and hardware/software tools to characterize the behaviour
CO4: Synthesize and evaluate single stage and multi stage amplifiers.

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VAAGDEVI COLLEGE OF ENGINEERING
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ELECTRONIC SIMULATION EDA TOOLS LAB

B. TECH- III Semester **L/T/P/C**
0/0 /3 /1.5

Pre Requisites: None

Course objectives:

- To introduce the basics of MATLAB software.
- To generate various signals.
- To find convolution and correlation between the signals using MATLAB software.
- To introduce the HDL Programming Language.
- To learn the simulation of combinational and sequential logic circuits using programming language.

Note:

- All the experiments are to be simulated using MATLAB/SCILAB & EDA tools or equivalent software.
- Minimum of 8 experiments from cycle I and 4 experiments from cycle II are to be completed.

List of Experiments:

Cycle I:

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit Impulse, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operations on Signals such as Addition, Multiplication, Scaling, Shifting, Folding.
4. Finding the Fourier transform of a given signal and plotting its magnitude and phase spectrum.
5. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane.
6. Verification of Linearity and Time Invariance Properties of a given Continuous systems.
7. Convolution of two Signals.
8. Verification of convolution property of Fourier transforms.
9. Auto Correlation and Cross Correlation of Signals.
10. Verification of Weiner-Khinchine Relations.

Cycle II:

11. Design of Logic gates.
12. Design of full adder & full subtractor.
13. Design of 8x1 Multiplexer.
14. Design of 4x2 priority encoder.
15. Design of 4 bit binary to gray code converter.
16. Design of flip flops: SR, JK, T, D.
17. Design of finite state machine.

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Illustrate different types of signals and methods of generating them using MATLAB.
CO2: Demonstrate the importance of convolution and correlation for different applications.
CO3: Simulate various digital circuits.
CO4: Design and develop functional analysis of combinational & sequential circuits.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROJECT BASED LEARNING-1

B. TECH- III Semester **L/T/P/C**
3/0 /0 /3

Educational practices that over-emphasize theory alone are outdated, as it is important for students to gain knowledge about engineering. Hence a transformation in teaching and learning approaches is essential to prepare students to solve complex problems in a global world. Students need to have exposure to a number of projects that offer real-world problems, along with the complexity and uncertainty of factors that influence such problems.

Project-based instruction differs from traditional inquiry by its emphasis on students collaborative or individual artifact construction to represent what is being learned.

Project-based learning also gives students the opportunity to explore problems and challenges that have real-world applications, increasing the possibility of long-term retention of skills and concepts.

Course Objectives:

- Integrate knowledge and skills from various areas through more complex and multidisciplinary projects
- Autonomous learning and work: unstructured problems that need research. Autonomy will lead to research and the search for information, and in that context is essential to develop their ability to discern which information is reliable and which is not.
- Teamwork: preparing students for a social environment
- Self-evaluation and self-criticism, against self-complacency, trying to see beyond their own ideas and knowledge.

Course Outcomes:

On the completion of this course, the students will able to:

CO 1: Apply the fundamental and engineering concepts in projects

CO 2: Develop the skills that include critical thinking, communication and creativity

CO 3: Identify meaningful connections across content of the course

CO 4: Design and develop learning concept models for societal perceptive

CO 5: Develop team work among multidisciplinary environment and engages lifelong learning.

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PROJECT BASED LEARNING-1

B. TECH- III Semester **L/T/P/C**
0/0 /2 /1

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(AUTONOMOUS)

NSS/NCC

B. TECH- III Semester **L/T/P/C**
3/0 /0 /3

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PULSE AND DIGITAL CIRCUITS

B. TECH- IV Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Basic Electronic Devices & Electronic Circuits Analysis

Course Objectives:

- To explain the complete response of R-C transient circuits.
- To explain clippers, clampers, switching characteristics of transistors.
- To construct various multivibrators using transistor, design of sweep circuits and sampling gates.

Unit I

Linear Wave Shaping: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and RC network as differentiator and integrator, attenuators, its applications in CRO probe.

Unit II

Non-Linear Wave Shaping: Diode clippers, Transistor clippers, clipping at two independent levels, Clamping Circuit, Clamping circuit theorem, practical clamping circuit.

Unit III

Switching Characteristics of Devices: Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage consideration of transistor, Design of transistor switch, transistor-switching times.

Unit IV

Multivibrators: Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors.

Unit V

Time Base Generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators, Methods of linearity and improvement.

Sampling Gates: Basic Operating principles of Sampling Gates, Unidirectional and Bi-directional Sampling Gates, four Diode Sampling Gate.

Text Books:

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

Reference Books

1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2. Fundamentals of pulse and digital circuits-Ronald.J.Tocci,3 ed. ,2008
3. Pulse and Digital Circuits-Motheki S.Prakash rao,2006,TMH
4. Wave Generation and Shaping - L. Strauss.

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Design the circuits for generating desired wave shapes (non-sinusoidal) for different applications like computers, control systems and counting and timing systems.
CO2: Analyze the applications of diode as Integrator, differentiator, clippers and clamper circuits.
CO3: Analyze the switching characteristics and applications of diode and transistor.
CO4: Analyze and design multivibrators for various applications and sweep circuits
CO5: Design the time base generators and sampling gates with the knowledge of basic principles

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(AUTONOMOUS)

ANALOG AND DIGITAL COMMUNICATIONS

B. TECH- IV Semester **L/T/P/C**
3/0 /0 /3

Pre-Requisites: Basic concepts of Signals and Systems

Course Objectives:

This course aims at:

- Developing and understanding the design of analog and digital communication systems.
- Study of analog and digital modulation techniques.
- Study of different error detecting and error correction codes like block codes, cyclic codes and convolution codes
- Establishing a firm foundation for the understanding of telecommunications systems, and the relationship among various technical factors when such systems are designed and operated.

Unit I

Amplitude Modulation: Introduction to communication system, Need for modulation, Amplitude Modulation, Definition, single tone modulation, power relations in AM waves, Generation of AM waves, square law Modulator, Detection of AM Waves: Square law detector, Double side band suppressed carrier modulators. AM Receiver-TRF & Super heterodyne receiver.

Unit II

Angle Modulation: Basic concepts of angle modulation, Frequency Modulation: Generation of FM waves, Direct FM, Single tone frequency modulation, Narrowband FM, Wideband FM, Transmission bandwidth of FM Wave - Detection of FM waves: Balanced frequency discriminator, Comparison of FM and AM.

Unit III

Communication System: Block diagram of Digital Communication Systems – Functionality of Blocks, Advantages of digital communication systems, Sampling theorem and Base band transmission - Wave form representation of binary digits - PCM, DPCM, DM, ADM systems, Matched filter, Inter symbol interference.

Unit IV:

Band Pass Transmission: ASK, FSK, PSK, QPSK, QAM, Comparison of error performance of non-coherently and coherently detected ASK, FSK and PSK systems.

Source Coding Techniques: Shannon's Law, Shannon Fano & Huffman coding.

Unit V:

Error Control Codes: Matrix description of linear block codes, Error detection and error correction capabilities of linear block codes, Cyclic codes: Algebraic structure, encoding, Syndrome calculation, decoding.

Convolution Codes: Encoding, decoding using state, Tree and trellis diagrams, Decoding using Viterbi algorithm.

Text Books:

1. An Introduction to Analog and Digital Communications, 2nd Ed. Simon Haykin, Wiley Publications.
2. Digital and analog communication systems- Sam Shanmugam, JohnWiley,2005
3. Communication Systems Engineering – John G Proakis, Masoud Salehi, PHI

Reference Books:

1. Electronic Communication Systems – Modulation and Transmission - Robert J. Schoenbeck, 2nd Ed., PHI.

2. Modern Digital and Analog Communication Systems 4ed by Lathi, 2013.
3. Digital Communication – Theory, Techniques, and Applications – R.N.Mutagi, 2nd Edition,2013

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Analyze and simulate the concepts of AM and AM Demodulation in communication.
CO2: Interpret with various angle modulation and demodulation systems
CO3: Demonstrate the understanding of various baseband transmission techniques.
CO4: Demonstrate the understanding of various digital modulation and demodulation techniques.
CO5: Explain different error detection and error correction codes like block codes, cyclic codes and convolution codes.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES.

B. TECH- IV Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives:
- To introduce the student to the fundamental theory and concepts of electromagnetic waves and transmission lines, and their practical applications.
- Tostudythepropagation,reflection,andtransmissionofplanewavesinboundedandunboundedmedia.

Unit I

Electrostatics: Vector Analysis, Introduction to co-ordinate Systems (i.e. Cartesian , Spherical & Cylindrical), Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems.

Unit II

Magnetostatics: Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatics Fields, Magnetic Scalar and Vector Potentials, Illustrative Problems.

Unit III

Conductors, Dielectric & Capacitance & Poison's & Laplace Equation: Current Density & Continuity Equation**,** Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Relaxation Time, Capacitance – Parallel Plate, Poisson's and Laplace's Equations, Illustrative Problems.

Unit IV

Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer EMF, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Introduction to Conditions at a Boundary Surface, Introduction of Poynting Vector and Significance of Poynting Theorem, Introduction to Electromagnetic waves: Properties & terminologies of Electromagnetic waves.

Unit V

Transmission Lines: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts,Losslessness/LowLossCharacterization,Distortion– ConditionforDistortionlessnessandMinimum Attenuation, Loading - Types of Loading, Illustrative Problems. Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements; λ/4, λ/2, λ/8 Lines – Impedance Transformations, Significance of Zminand Zmax, Smith Chart – Configuration and Applications, Single and Double Stub Matching, Illustrative Problems.

Text Books:

1. Elements of Electromagnetics – Matthew N.O. Sadiku, 4thEd., Oxford Univ. Press, 2008
2. ElectromagneticWavesandRadiatingSystems–E.C.JordanandK.G.Balmain,2ndEd.,2000,PHI.
3. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan, 2001, (Tech. India Publications), New Delhi.

Reference Books:

1. EngineeringElectromagnetics–NathanIda,2ndEd.,2005,Springer(India)Pvt.Ltd.,NewDelhi.
2. Networks, Lines and Fields – John D. Ryder, 2ndEd., 1999,PHI.
3. EngineeringElectromagnetics–WilliamH.HaytJr.andJohnA.Buck,7thEd.,2006,TMH.

Course Outcomes:

After the completion of this course, the students should be able to:

CO1: Apply vector calculus to electrostatic fields in different engineering situations. Use Gauss's Law,oulomb'slawtofindfieldsandpotentialsforavarietyofsituationsincludingchargedistributions.

CO2: Explain, illustrate&canapplytheconceptofmagnetostaticsindifferentengineeringsituations.

CO3: Analyze & explain the concept of conductors, dielectrics & capacitance, electromagnetic waves characteristics & terminologies and; be able to compute the Pointing vector and identify the power flow direction.

CO4: StudytimevaryingMaxwell'sequationsandtheirapplicationsiselectromagneticproblems.

CO5: Describes the transmission lines with equivalent circuit and explain their characteristics & use its knowledge in different engineering situations.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROBABILITY THEORY AND STOCHASTIC PROCESS

B. TECH- IV Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objective:

The primary objectives of this course are:

- To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of probability theory, as well as solve probabilistic problems in signal processing and communication engineering.
- To introduce students to the basic methodology of probabilistic thinking and to apply it to problems.

Unit I

Probability and Random Variables:

Probability theory – Random Variables Expected value of Random Variables, function of a Random Variables – Moments – Moment generating function – Binomial, Poisson, Geometric, Exponential, Normal distributions, functions of Random Variables, covariance and its properties.

Unit II

Two Dimensional Random Variables:

Two dimensional Random Variables joint distribution & properties – Marginal and conditional distributions, joint characteristic functions, Transformation of Random Variables, Central limit theorem, Simple problems.

Unit III

Random Processes:

Classification of Random processes – Stationary – WSS and SSS processes, Gaussian random process Poisson Random process –Renewal Process – Markov Chain and transition probabilities.

Unit IV

Spectral Density:

Power spectral Density Function – Properties – System in the form of convolution – Unit Impulse Response of the System – Einstein – Weiner-Khinchine Relationship – Cross Power Density Spectrum – Properties.

Unit V

Information Theory:

Information theory and entropy, conditional entropy and redundancy, bandwidth-S/N Tradeoff, Hartley Shannon law, mutual information, information loss due to Noise.

Text Books

1 T. Veerarajan, "Probability, Statistics and Random Processes", Tata McGraw – Hill Publishing Company Limited, New Delhi, 2004.

Reference Books

1. Trivedi K S, "Probability and Statistics with reliability, Queuing and Computer Science Applications", Prentice Hall of India, New Delhi, 1984.

Course Outcomes:

Upon completion of the subject, students will be able to:

CO1: Understand the basic concepts of probability theory and random processes.
CO2: Solve simple engineering problems with the knowledge of two dimensional random variables.
CO3: Compare and contrast the various random processes.
CO4: Analyze the autocorrelation and cross correlation functions and their properties.
CO5: Understand concepts of information theory and Shannon law.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

COMPUTER ORGANIZATION

B. TECH- IV Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives:

- To discuss the basic concepts and structure of computers .
- To understand the concepts of register transfer logic .
- To explore the memory organization & I/O organizations.
- To explain different types of addressing modes.
- To learn different types of serial communication techniques.

Unit I

Basic Structure Of Computers: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Data Representation: Fixed Point Representation, Floating - Point Representation.

Computer Arithmetic: Addition and subtraction, Multiplication Algorithms, Division Algorithms, Floating - point Arithmetic operations.

Unit II

Register Transfer Language and Micro operations: Register Transfer language, Register Transfer Bus and memory transfers, Arithmetic micro operations, Logic micro operations, Shift micro operations, Arithmetic logic shift unit, Instruction codes, Computer Registers, Computer instructions-Instruction cycle, Input - Output and Interrupt, STACK organization, Instruction formats, Addressing modes, Data Transfer and manipulation, Program control.

Unit III

Micro Programmed Control: Control memory, Address sequencing, micro program example, design of control unit, hard wired control, Micro programmed control.

Unit IV

The Memory System: Basic concepts of semiconductor RAM memory, Read-only memory ,Cache memory, performance considerations, Virtual memory, secondary storage, Introduction to RAID.

Input-Output Organization : Peripheral Devices, Input-Output Interface, Asynchronous data transfer ,Modes of Transfer, Priority Interrupt , Input -Output Processor (IOP), Serial communication; Introduction to peripheral component, Interconnect (PCI) bus, Introduction to standard serial communication protocols like RS232, USB.

Unit V

Pipeline and Vector Processing: Parallel processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Multiprocessors: Characteristics of multiprocessors, Interconnection Structures, Interprocessor Arbitration. Inter Processor Communication and Synchronization.

Text Books:

1. Computer Organization – Carl, Hamacher, Zvonko Vranesic, Sofwatzaky, 5th Edition McGraw hill.
2. Computer Systems Architecture – M. Morris Mano III rd Edition Pearson.

References:

1. Computer Organization and Architecture-William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization - Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, Sivaraama Dandamudi springer Int, Edition

4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

Course Outcome:

Upon completion of this course, the students will be able to:

CO1: Describe the fundamental organization of a computer system.
CO2: Understand the concepts of register transfer logic and arithmetic operations.
CO3: Understand the concepts of Hardwired control and micro programmed control.
CO4: Explain the I/O and memory organization in depth .
CO5: Understand the concepts of parallel processing, pipelining and inter processor communication.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PULSE AND DIGITAL CIRCUITS LAB

B. TECH- IV Semester **L/T/P/C**
0/0 /3 /1.5

Pre Requisites: EDC and ECA lab

Course Objectives:

- To design and construct the RC circuits clippers, clampers.
- To construct various multivibrators using transistor
- To construct sampling gates using diodes and transistors.

List of experiments (Minimum Twelve experiments to be performed):

1. Linear wave Shaping
2. Non-linear wave shaping Clippers
3. Non-linear wave shaping Clampers
4. Transistor as a switch.
5. Study of logic gates and some applications.
6. Study of flip-flops and some applications.
7. Sampling gates.
8. Astable multivibrator.
9. Monostable multivibrator.
10. Bistable multivibrator.
11. Schmitt trigger.
12. UJT relaxation oscillator.
13. Bootstrap sweep circuit.
14. Constant current sweep generator using BJT.

Equipment required for laboratories:

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

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the applications of diode as integrator, differentiator, clippers and clamper circuits.
CO2: Demonstrate basic logic gates and sampling gates
CO3: Design and analyze various multivibrator circuits and schmitt trigger circuit.
CO4: Design and analyze UJT relaxation oscillator and boot-strap sweep circuits

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ANALOG AND DIGITAL COMMUNICATIONS LAB

B. TECH- IV Semester **L/T/P/C**
0/0 /3 /1.5

Pre-Requisites: Basic concepts of Signals and Systems

Course Objectives:

- This laboratory provides practical exposure and hands-on training to students with communication systems.
- To design various analog and digital modulation and demodulation techniques.
- To study of different error detecting and error correction codes like convolution codes.
- To design and get practical knowledge on multiplexing techniques.

Note: Minimum 12 experiments should be conducted

1. Amplitude modulation and demodulation.
2. SSB-SC Modulator & Detector (Phase Shift Method)
3. Frequency modulation and demodulation.
4. Study of spectrum analyzer and analysis of AM and FM Signals
5. Pulse Amplitude Modulation & Demodulation
6. Pulse Width & Pulse Position Modulation & Demodulation
7. Differential Pulse Code Modulation
8. Delta Modulation.
9. Frequency shift keying: Generation and Detection.
10. Phase Shift Keying: Generation and Detection.
11. Amplitude Shift Keying: Generation and Detection.
12. DPSK Generation and Detection
13. Convolution Encoder and Decoder
14. Frequency Division Multiplexing

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Understand the different types of modulation techniques.
CO2: Understanding the multiplexing and coding schemes.
CO3: Assess different digital modulation and demodulation techniques.
CO4: Apply suitable modulation schemes and coding for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

HARDWARE DESIGN LAB

B. TECH- IV Semester **L/T/P/C**
0/0 /3 /1.5

Pre Requisite: Basic Electronic Devices Lab (II SEM), Electronic Circuit Analysis Lab (III SEM).

Course Objectives:

- To impart the essentials of electronic circuit design for the students & exhibit their practical knowledge in this design Laboratory.
- To study advanced working modules in the field of Electronics with the help of case studies of various applications.
- To bridge the gap between the industry and institution.
- The Lab provides hands-on experience to complement the theoretical learning with practical applications.

List of Experiments (Any SIX experiments from cycle I and FOUR from cycle II):

Note: The experiments must be executed on bread board using discrete components and integrated circuits(IC'S).

Cycle I:

1. To study the simple printed circuit board (PCB) and design self biased Common Emitter amplifier on PCB and verify its output.
2. Design the Regulated power supply using 78XX series ICs and Bridge rectifier.
3. Design a simple street light control circuit using LDR and test with LED's.
4. Design an audio amplifier and verify.
5. Design a differential amplifier and verify.
6. Design a Non-sinusoidal waveform generator using transistor
7. Design a 4-Bit Hamming Code Generator.
8. Design a Digital counter using seven segment display/LED display.

Cycle II:

To study ARDUINO processor board and verify its applications like sequential blinking control of LED's, print your name on LCD by interfacing 16X2 LCD, distance measurement circuit using ultrasonic sensor, color detector circuit with color sensor TCS3200, smell detection. Home automation etc..

Course Outcomes:

CO1: Design their own projects on PCB up to industrial grade.
CO2: Understand the Design concepts of various Analog circuits and their applications.
CO3: Design and analyze the different Digital logic circuits.
CO4: Understand the arduino uno board and to interface various real time application circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROJECT BASED LEARNING-2

B. TECH- IV Semester **L/T/P/C**
0/0 /2 /1

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

LINEAR & DIGITAL IC APPLICATIONS

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Pulse and Digital Circuits & Switching Theory and Logic Design

Course Objectives: The main objectives of the course are:

- To teach the linear and non-linear applications of operational amplifiers.
- To introduce the concepts of waveform generation and active filters.
- To introduce the theory and applications of Timer and PLL.
- To teach the theory of ADC and DAC
- To understand and implement the working of basic digital circuits.

Unit I

Operational Amplifier: Basic information of Op-Amp, IC 741 introduction, ideal characteristics of Op-amp, modes of operation-inverting, non-inverting, differential. DC and AC Characteristics. Basic op-amp applications - Adder, Subtractor, Instrumentation amplifier, Differentiators and Integrator.

Unit II

Oscillators & Active Filters: Comparator and its applications, Principle of operation – RC phase shift Oscillator and Wien bridge Oscillator, Waveform generators, multivibrators. 1st order LPF, HPF filters, Band pass, Band reject and all pass filters.

Unit III

Timers & Phase Locked Loops: Introduction to 555 timer, functional diagram, monostable and astable operations, Schmitt Trigger. PLL -Introduction, principles and description of individual blocks of 565.

Unit IV

D-A and A-D Converters: Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC, and Dual slope integration type ADC.

Unit V

Combinational and Sequential Logic ICs – Familiarity with commonly available 74XX Series ICs – Decoders, Encoders, Multiplexers, Demultiplexers, Magnitude Comparators. All Types of Flip-flops, Synchronous Counters, and Decade Counters.

Text Books:

1. Linear Integrated Circuits –D. Roy Chowdhary, New Age International (p) Ltd, 2nd Ed., 2003
2. Op-Amps & Linear ICs – Ramakanth A. Gayakwad, PHI, 2003.
3. Modern Digital Electronics – RP Jain – 4/e – MC GRAW HILL EDUCATION, 2010.

Reference Books:

1. Op Amps and Linear Integrated Circuits-Concepts and Applications James M. Fiore, Cengage Learning/ Jaico, 2009.
2. Operational Amplifiers with Linear Integrated Circuits by K. Lal Kishore – Pearson, 2009.
3. Linear Integrated Circuits and Applications – Salivahanan, MC GRAW HILL EDUCATION.
4. Digital Fundamentals – Floyd and Jain, Pearson Education, 8th Edition, 2005.

Course Outcomes:

Upon completion of this course, the student will be able to

CO1: Understand the operational amplifiers with linear integrated circuits.
CO2: Classify various active filter configurations based on frequency response and construct using 741 Op-Amp.
CO3: Design and describe the concepts of timer using IC 555, basic principle of PLL.
CO4: Understand various ADC and DAC techniques
CO5: Design Combinational and Sequential circuits using ICs.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DIGITAL SIGNAL PROCESSING

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: Signals and systems

Course Objectives:

- To provide background and fundamental material for the analysis and processing of digital signals.
- To study fundamentals of time, frequency and Z-plane analysis and to discuss the inter-relationships of these analytic method.
- To study the Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT) for signal analysis.
- To study the designs and structures of digital (IIR & FIR) filters from analysis to synthesis for agiven specifications.
- To introduce the architecture of DSP processors

Unit I

Theory of discrete time linear systems: Introduction, Classification of Signals and Systems, Discrete Time systems, Linearity, Time Invariance, Causality, Stability.

Z-transform: Z-transform and its properties, Inverse Z transforms, Difference equations, Transfer function of linear discrete systems, Impulse response.

Unit II

Discrete Fourier transform: Discrete Fourier Transform (DFT) definition, Properties of discrete Fourier transforms, Convolution of sequences - linear convolution.

FFT algorithms: Properties of Twiddle factor, Introduction to Radix 2 Fast Fourier transform (FFT), Decimation in time FFT and Decimation in frequency FFT Algorithms, Computing Inverse DFT using FFT.

Unit III

Theory and design of digital non recursive filters: Design characteristics of FIR filters with linear phase, Frequency response of linear phase FIR filters, FIR filters using window functions,

Realization of non recursive filters: Direct form structure, Cascade form structures, FIR Linear Phase Realization.

Unit IV

Theory and design of digital recursive filters: Review of design techniques for analog low pass filter, frequency transformation, Properties of IIR filter, IIR filter design, Different methods of IIR filter design,

Realization of recursive filters: Direct form structures, Signal flow graphs and transposed structures, cascade form structures, Parallel form structures.

Unit V

General purpose digital signal processors: Introduction, Computer architectures for signal processing-Von Neumann architecture, Harvard architecture, Pipelining, Multiply accumulation unit, on chip memory/cache and Extended parallelism. General-purpose digital signal processors.

Text Books

1. J.G.Proakis , D.G. Manolakis and D. Sharma, Digital Signal Processing - Principles, Algorithms andApplications, Pearson Education, 2006
2. Simon Haykin & Barry vanveen, Signals and Systems, 2nd edition, John Wiley publication, 2004/2005

Reference Books

1. Oppenhiem V.A. and Schaffer, Discrete - time Signal Processing, Prentice Hall of India,2005
2. Leudeman L.C, Fundamentals of Digital Signal Processing, Harper & Row Publication,2006
3. Emmanuel C.Ifeachor, Digital Signal Processing -A Practical Approach , Pearson Education, 2006
4. Andreas Antoniou, Digital Signal Processing, Tata McGraw-Hill,-2006

Course Outcomes:

Upon completion of this course, the student will be able to

CO1: Identify the different types of the discrete signals and systems.

CO2: Understand the DFT, FFT and interrelation between DFT and various transforms.

CO3: Understand the characteristics of FIR filters and classify the different types of windowing techniques.

CO4: Design a IIR digital filters for a given specifications and Apply the knowledge to real world processing applications.

CO5: Understand different types of signal processing architectures.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CONTROL SYSTEMS

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: Engineering Physics, Mathematics-I&II & Electrical Circuits

Course Objectives:

In this course it is aimed to introduce

- The principles and applications of control systems in everyday life.
- The basic concepts of block diagram representation,
- Introduce concept of stability of systems in frequency domain and time domain.
- Concept of state space representation and multi input and multi output systems.

Unit I

Introduction: Concepts of Control Systems- Open Loop and closed loop control systems and their differences-Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models – Differential equations, Impulse Response and transfer functions-Translational and Rotational mechanical systems, Signal flow graph -Reduction using mason's gain formula.

Unit II

Time Response Analysis: Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants.

Unit III

Stability Analysis: The concept of stability – Routh- Hurwitz stability criterion – Absolute stability and conditional stability.

Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

Unit IV

Stability Analysis in Frequency Domain: Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots. Polar Plots, Nyquist Plots and applications of Nyquist criterion to find the stability–Effects of adding poles and zeros to G(s)H(s) on the shape of the Nyquist diagrams.

Unit V

State Space Analysis of Continuous Systems: Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization - Solving the Time invariant state Equations- State Transition Matrix and its Properties. Concepts on Controllability and Observability.

Text Books:

1. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.
2. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John Wiley and sons.
3. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

Reference Books:

1. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
2. Control Systems Engg. by NISE 3rd Edition – John Wiley

3. Control Systems by S.Kesavan, Hitech Publications.
4. "Modeling & Control of Dynamic Systems" by Narciso F. Macia George J. Thaler, Thomson Publishers.
5. Solutions and Problems of Control Systems by A.K.Jairath, CBS Publictions,1992.

Course Outcomes:

Upon completion of this course, the student will be able to

CO1: Understand the concept of feedback and analyze the control system components by their Mathematical modelling.

CO2: Estimate the time domain specifications and steady state error.

CO3: Apply various time domain techniques to assess the system performance.

CO4: Formulate different types of analysis in frequency domain to explain the nature of stability of the system..

CO5: Test system Controllability and Observability using state space representation and applications of state space representation to various systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Professional Elective-I)

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives:

- To emphasize the application of statistical techniques in evaluating the performance of an instrument.
- To introduce the fundamental concepts and basic principles of Electronic Measuring instruments.
- To provide the basic knowledge measurement techniques for different types of tests.
- To provide the knowledge of use of various measuring techniques for measurement of different physical parameters using different classes of transducers.
- To provide adequate knowledge about working of CRO, LED and LCD.

Unit I

Introduction: Functional elements of an instrument – Static and dynamic characteristics of zero, first and second order instruments – sources of Errors in measurement – Techniques for reducing error – loading effect of instruments - Statistical evaluation of measurement data – significant figure, mean, median, standard deviation.

Unit II

Electrical and Electronic Instruments: Classification of instruments – Working Principle of potentiometer, Design of analog voltmeter, ammeter using PMMC and resistors and its loading effect. – Principle, types and working of analog and digital multimeter – digital frequency meter.

Unit III

Comparison Methods of Measurements: Digital voltmeters (DVM) D.C & A.C bridges –Design of deflection bridges - Wheatstone bridge, Kelvin bridge, Maxwell bridge, Anderson bridge, Schering Bridge, Wien Bridge.

Unit IV

Transducers and Data Acquisition Systems: Classification of transducers – Selection of transducers – Resistive, capacitive & inductive transducers – Piezoelectric, optical and digital transducers – Elements of data acquisition system and their specifications.

Unit V

Storage and Display Devices: Working principle and specifications of the Analog CRO and digital CRO, LED and LCD.

Text Books

1. Modern Electronic Instrumentation and Measurement Techniques: A.D. Helbincs, W.D. Cooper: PHI 5th Edition 2003.
2. Electronic Instrumentation: H. S. Kalsi – Mc Graw Hill Education, 2nd Edition 2004.

References

1. A K Sawhney - Electrical and Electronic Measurements.
2. Golding E.W and Widdis F.G., - Electrical Measurements and Measuring Instruments‘, Fifth Edition, Wheeler and Co., New Delhi, 2000.
3. D.V.S. Moorthy, - Transducers and Instrumentation‘, Prentice Hall of India Pvt Ltd, 2003.
4. J. B. Gupta, - A Course in Electronic and Electrical Measurements‘, S. K. Kataria & Sons, Delhi, 2003.

Course Outcomes:

Upon completion of this course, the student will be able to

CO1: Describe the fundamental concepts, different terminology related to measurements and principles of instrumentation.

CO2: Explain the operations of the various instruments required in measurements.

CO3: Apply the measurement techniques for different types of tests.

CO4: Select specific instrument for various parameters measurement.

CO5: Apply knowledge of different oscilloscopes like CRO, DSO and display devices.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

COMPUTER NETWORKS
(Professional Elective-I)

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To introduce UDP and TCP Models.

Unit I

Overview of the Internet: Introduction to computer networks, Different topologies used in computer network, OSI Model, TCP/IP Protocol Suite, Comparison of the OSI and TCP/IP reference model.
Physical Layer: Guided transmission media, wireless transmission media.
Data Link Layer - Design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol.

Unit II:

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

Unit III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection-oriented networks-routing algorithms-optimality principle, shortest path, flooding, distance vector routing, control to Infinity problem, Hierarchical Routing, Congestion control algorithms.

Unit IV:

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol.
Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery

Unit V:

The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.
Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail.

Text Books

1. Data Communications and Networking - Behrouz A.Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

References books

1. AnEngineeringApproachtoComputerNetworks-S.Keshav,2ndEdition,PearsonEdication.
2. UnderstandingcommunicationsandNetworks,3rdEdition,W.A.Shay,CengageLearning.

Course Outcomes:

Upon completion of this course students

CO1: Will be in a position to understand World Wide internet concepts.

CO2: Should be able to demonstrate and explore the basics of Computer Networks and various protocols.

CO3: Will be in position to administrate a network and flow of information.

CO4: Able to contrast different internetworking protocols.

CO5: Able to demonstrate different Internet Transport Protocols

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

BASIC JAVA PROGRAMMING
(Professional Elective-I)

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre-Requisites: Programming for Problem Solving.

Course Objectives:

- This course introduces computer programming using the JAVA programming language with object-oriented programming principles.
- The use of Java in a variety of technologies and on different platforms.
- To understand fundamentals of object-oriented programming in Java which includes defining classes, invoking methods, using class libraries.
- Introducing API to solve real world problems.

Unit I

OOP Concepts: Procedural and Object Oriented Programming Paradigms. OOP Features, OOP Concepts-Classes and Objects, Data Abstraction, Encapsulation, Inheritance, Polymorphism.

Java Programming: History of Java, Data Types, Variables, Constants, Scope and Life Time of Variable, Operators, Type Conversion and Casting, Conditional Statements, Iterative statements, Break and Continue statements, Access Controls, Arrays, Methods and Constructors, Static variables and Static methods, This reference, Overloading methods, Garbage collection, Nested Classes, and Inner Classes.

Unit II

Inheritance: Inheritance - Types of Inheritance, Member access rules, Method Overriding, Super keyword, Preventing Inheritance: Final classes and methods.

Interfaces: Abstract class, defining an Interface, Abstract Vs Interface, implementing and extending Interface.

Unit III

Packages- Defining, creating and accessing a Package, and importing Packages.

Exception Handling- Exception Handling**,** Types of Exceptions. Usage of try, catch, throw, throws and finally, re-throwing exceptions, and User defined Exceptions.

Unit IV

Multi Threading- Creating Thread, Life cycle of Thread, Thread priorities, synchronization of Threads, Inter-Thread Communication.

Collection Framework in Java- Overview of Java Collection Frame work, Generics, Commonly used Collection Classes and Interfaces-Array List, Vector, Hash Table, Stack, String Tokenizer, Scanner, Calendar, and Properties.

Unit V

GUI Programming with Java- AWT class Hierarchy, Introduction to Swing, Swing vs. AWT, Containers-JFrame, JApplet, and JPanel, Swing components- JButton, JLabel, JTextField, and JTextArea.

Applet: Create an Applet, Life Cycle of an Applet, and passing parameters to Applet.

JDBC: Connecting to Data Base- JDBC Type 1 to 4 drivers, connecting to a data base, querying a data base and processing the results.

Text Books:

1. Java the Complete Reference, 8th Edition. Herbert schildt. Indian edition.

Reference books:

1. Java for Programmers, P.J. Dietel and H.M Dietel, Pearson Education (OR) JAVA: How to Program P.J. Dietel and H.M. Dietel, PHI.
2. Object Oriented Programming through Java, P. Radha Krishna, University Press.
3. Thinking in Java, Bruce Ecel, Pearson Education
4. Programming in Java, S. Malhotra and S. Choudary, Oxford Univ. Press.

Course Outcomes:

Upon completion of this course, the student will be able to

CO1: Understand the use of OOP concepts and solve real world problems using OOP techniques.
CO2: Solve the inter-disciplinary applications using the concept of inheritance.
CO3: Understand the multithreading concepts and develop efficient applications.
CO4: Design GUI based applications and develops applets for web applications.
CO5: Develop program using JDBC connectivity to access data from database and execute different queries to get required results.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

B. TECH – V Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objective:

- To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business, operations cost analysis, markets, forms of business organizations, capital budgeting and financial accounting and financial analysis.

Unit I

Introduction & Demand Analysis.

Definition. Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants. Law of Demand and its exceptions. Elasticity of Demand: Definition. Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting. Factors governing demand forecasting. methods of demand forecasting.

Unit II

Production & Cost Analysis: Production Function:

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

Unit III

Markets & New Economic Environment:

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

Unit IV

Capital Budgeting:

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

Unit V

Introduction to Financial Accounting & Financial Analysis:

Accounting concepts and conventions - Introduction IFRS Ledger. Double - Entry Book Keeping, Journal, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance sheet with simple adjustments).

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

References:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand '2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis. New Age

International Publishers, Hyderabad 2013
3. M' Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi. 2012.
4. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2012.

Course Outcomes:

Upon completion of this course, the student will be able to

CO1: Understand the nature, scope and importance of Managerial Economics.

CO2: Know what is demand, analyze demand and how elasticity of demand is used for pricing decisions and to evaluate methods for forecasting demand.

CO3: Know how production function is carried out to achieve least cost combination of Inputs and how to analyze cost.

CO4: Understand the characteristics of different kinds of markets and outline different form of business Organization and analyze how capital budgeting techniques are used for investment decisions.

CO5: Know how to prepare final accounts and how to interpret them, analyze and interpret financial statements using ratio analysis.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

LINEAR & DIGITAL IC APPLICATIONS LAB

B. TECH – V Semester **L/T/P/C**
0/0 /3 /1.5

Pre-requisites: None

Course Objectives:

- To design and analyze of adder, subtractor using IC741.
- To understand the operations of differentiator and integrator using IC 741.
- To design and analyze of active filter.
- To construct and understand of the different multivibrators using IC 555.
- To construct and analyze different waveform generators IC741.
- To understand and verification of various 74 series TTL.

Verify the Following Functions

1) Adder, Subtractor, Comparator using IC 741 Op-Amp.
2) Integrator and Differentiator using IC 741 Op-Amp.
3) Design Active Low Pass & High Pass Filter
4) RC Phase shift and Wien Bridge Oscillators using IC741 Op-Amp
5) IC 555 Timer in Monostable and Astable multivibrator, operationas.
6) Schmitt trigger circuits using IC 741 & IC 555.

Verify the Functionality of the following 74 series TTL ICs.

7) D Flip-Flop (74S74) and JK Master-Slave Flip-Flop (74LS73)
8) Decade counter (74LS90) and UP-Down Counter (74LS191)
9) 3-8 decoder – 74LS138.
10) 4 Bit Comparator 74LS85.
11) 8X1 Multiplexer – 74151
12) 1x4 Demultiplexer – 74155

EQUIPMENT REQUIRED:

1. 20 MHz / 40 MHz / 60 MHz Oscilloscope.
2. 1 MHz Function Generator (Sine, Square, Triangular and TTL).
3. Regulated Power Supply.
4. Multimeter / Volt Meter.

Course Outcomes

Upon completion of this Lab, the student will be able to
CO1: Design circuits using operational amplifiers for various applications.
CO2: Understand the different logical gates & decoders, flip-flops.
CO3: Apply the knowledge of OP-AMPS to design various analog circuits.
CO4: Compare linear and digital integrated IC's.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DIGITAL SIGNAL PROCESSING LAB

B. TECH – V Semester **L/T/P/C**
0/0 /3 /1.5

Pre Requisites: Electronic simulation EDA tools lab

Course Objectives:

- To study the designs and structures of digital (IIR & FIR) filters from analysis to synthesis for a given specifications.
- To acquaint in FFT algorithms, multi-rate signal processing techniques.
- To provide background and fundamental material for the analysis and processing of digital signals.

Note:

- Minimum of 12 experiments are to be conducted.
- The programs shall be implemented in software (using MATLAB/Scilab/labview/ c programming/OCTAVE equivalent) and hardware (using/TI/Analog device/ Motorola/ Equivalent DSP processors).

1. Generation of Sinusoidal waveform / signal based on recursive difference equations
2. To find the Convolution of the given Discrete Time signals
3. To find the Correlation of the given Discrete Time signals
4. To find DFT / IDFT of given DT signal
5. To find Z Transform and Inverse Z Transform.
6. To find frequency response of a given system given in Transfer Function/ Differential equation form.
7. Implementation of FFT of given sequence
8. Determination of Power Spectrum of a given signal(s).
9. Implementation of LP FIR filter for a given sequence
10. Implementation of HP FIR filter for a given sequence
11. Implementation of LP IIR filter for a given sequence
12. Implementation of HP IIR filter for a given sequence
13. Generation of Sinusoidal signal through filtering
14. Impulse response of first order and second order systems.

Course Outcomes:

Upon completion of this Lab, the student will be able to

CO1: Analyze signals using the discrete Fourier transform (DFT).
CO2: Understand Convolution process.
CO3: Understand FFT algorithm for efficient computation of DFT.
CO4: Design IIR & FIR filters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B. TECH – V Semester **L/T/P/C**
0/0 /2 /1

Prerequisite: English Language and Interactive Communication Skills Lab

Course Objectives

This Lab focuses on using multi-media instruction for language development to meet the following targets. By the end of the course the students will be able

- To prepare the students for their placements by improving communication skills.
- To familiarize and train students with the types and elements of Résumé/ Curriculum Vitae.
- To expose students to the concepts of report writing familiarize and train students to write technical reports.
- To practice interview skills as an observer, an interviewer and/or an interviewee.

Introduction

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

The proposed lab should be a laboratory course to enable students to use 'good' English and perform the following:

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

Syllabus

Module 1: Fundamentals of Interpersonal Communication

- Listen to process information- give information, as part of a simple explanation – conversation starters: small talk-exposure to functional aspects of intonation- accent- tone- pauses for practice – compare information and ideas from multiple sources- converse with reasonable accuracy over a wide range of everyday topics.
- Lexical chunks for accuracy and fluency- factors influencing the fluency, Role play-deliver a five-minute formal / informal talk – greetings – respond to greetings – invite and offer – accept – decline – take leave- making a request-apology etc.
- Listening for gist- listening for details-Being an active listener: giving verbal and non-verbal feedback – Summarizing academic readings and lectures - conversational speech listening to and participating in conversation – persuasion.

Module 2: Effective Writing Skills

- Résumé Writing-Concept of Résumé Writing-Professional career objective-Resume-Curriculum vitae, Biodata: Difference-Format of Résumé and Types of Résumés -Tips to build a winning Résumé-Tips to write effective cover letter-Statement of Purpose-Letters of Recommendation.
- Report Writing-Elements of Report Writing- Significance, format, layout, and mechanism- types of Reports-Newspaper Reports-Technical reports -Special Reports-Report in manuscript format.

Module 3: Presentation Skills
Oral presentations -individual and group through JAM sessions/seminars/PPTs and Written presentations through posters/projects/reports.
Module 4: Group Discussion
Concept and process of Group Discussion-Importance of Group Discussion-Do's and Don'ts of Group Discussion-Group Discussion for placements-Practice on topics–Current affairs, Abstract topics, General awareness, Business and economy, Education and Social issues.
Module 5: Interview Skills
Interview Skills: Meaning and Purpose of Interview-Types of interviews-telephonic interview, video conference-(n) etiquette; Interview preparation techniques-Dress code at an interview-Types of interview questions-FAQs in HR Interview.

Minimum Requirement of infrastructural facilities for Advanced English Communication Skills Lab:
The Advanced English Communication Skills (AECS) Laboratory shall have the following infrastructural facilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo
- Headphones of High quality
- Forty movable chairs and Eight round tables to accommodate 5 students per each table

Prescribed Lab Manual: A book titled **A Course book of Advanced Communication Skills Lab** published by Universities Press, Hyderabad.
Suggested Software: The software of the topics prescribed above are procured and used.

- Globarena
- Open source software
- Oxford Advanced Learner's Compass, 8thEdition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- The following software from 'train2success.com'
  - Positive Thinking
  - Interviewing Skills
  - Telephone Skills
  - Time Management
  - Skill mate
  - Presentation skills, Cambridge (with VCD)

Books Prescribed:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam& Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
3. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011.
4. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. Business and Professional Communication: Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.

Distribution and Weightage of Marks:

- The practical examinations for the Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.

- For the English Language lab sessions, there shall be continuous evaluation during the year for 30 sessional marks and 70 End Examination marks. Of the 30 marks, 20 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned, by inviting the External Examiner from outside. In case of the non-availability of the External Examiner, other teacher of the same department can act as the External Examiner.

Mini Project: As a part of Internal Evaluation

- Seminar/ Professional Presentation
- A Report on the same has to be prepared and presented.
- Teachers may use their discretion to choose topics relevant and suitable to the needs of students.
- Not more than two students to work on each mini project.
- Students may be assessed by their performance both in oral presentation and written report.

Course Outcomes

After completing this course, students will be able to:

CO1: Participate in group discussion to present their viewpoints briefly and effectively.

CO2: Inculcate flair for writing and felicity in written expression in Résumé / Curriculum Vitae / reports.

CO3: Participate confidently with appropriate body language in interviews.

CO4: Enhance their team building skills and capabilities for effective decision making.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROJECT BASED LEARNING-3

B. TECH – V Semester **L/T/P/C**
0/0 /2 /1

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
MICROPROCESSORS & MICROCONTROLLERS

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Computer Organization

Course Objectives:

The course objectives are:

- Outline the history of computing devices.
- To develop an in-depth understanding of the architecture operation of 8086 microprocessors.
- To develop an in-depth understanding of the architecture operation of 8051 microprocessors.
- To understand machine language programming & interfacing techniques.

Unit I

Architecture of Microprocessors: Introduction to Microprocessors & Microcontrollers and. Overview of 8085 microprocessor. Overview of 8086 microprocessor. Signals and pins of 8086 microprocessor. Physical memory organization, maximum mode & minimum mode with timing diagrams.

Unit II

Assembly language of 8086: Machine language Instruction format, Addressing modes, Instruction set of 8086, Assembler Directives and Operators, Assembly software programs with algorithms

Unit III

Interfacing with 8086: Interfacing with RAMs, ROMs Interfacing with peripheral ICs like 8255, 8279, etc. Interfacing with key boards, ADCs, and DACs serial data transfer schemes USART 8251 serial data communication, interrupt vector table, interrupt structure with 8259 etc.

Unit IV

introduction to microcontrollers: overview of 8051 microcontroller, architecture, Input ports, memory organization, addressing modes and instruction set of 8051, simple programs

Unit V

8051 Real time control: programming timer interrupts, programming external hardware interrupts, programming the serial communication interrupt, programming 8051 timers and counters.

Text Books:

1. D. V. Hall, Microprocessors and interfacing, TMGH, 2nd Edition 2006
2. Kenneth. J. Ayala, The 8051 microcontroller, 3rd ed.,cengage learning.

Reference Books

1. Ramesh S.Gaonkar, "Microprocessor - Architecture, Programming and Applications with the 8085", Penram International publishing private limited, fifth edition.
2. Doughlas V Hall, "Digital Systems and Microprocessors", McGraw Hill. 3rd Edition 2003
3. A.K. Ray & K.M.Bhurchandi, "Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing", TMH, 2002 reprint.
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, "The 8051 microcontroller and embedded systems", Pearson education, 2004.

Course Outcomes:

Upon completion of the course students should be able to

CO1: Illustrate the internal organization of popular 8086/8051 microprocessors/microcontrollers. Contrast hardware and software interaction and integration.

CO2: Design microprocessors and microcontrollers based systems and develop microcontroller based systems for real time applications

CO3: Understand microcontroller 8051 and its programming.

CO4: Explain the Memory organization, classification and their applications and

CO5: Assess programming, interfacing etc of various devices with microprocessors and external world.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

VLSI DESIGN

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Basic Electronic Devices, Electronic circuit analysis, Switching theory and Logic Design & Linear & Digital IC Applications

Course Objectives

- To brief about HDL in terms of Verilog and circuit design using different styles.
- Give exposure to different steps involved in the fabrication of ICs using MOS transistor, CMOS/BICMOS transistors and passive components. Explain electrical properties of MOS and BICMOS devices to analyze the behavior of inverters designed with various loads.
- Give exposure to the design rules to be followed to draw the layout of any logic circuit.
- Provide concept to design different types of subsystems that includes data path subsystem, array subsystem etc
- Understand basic programmable logic devices and testing of CMOS circuits.

Unit I:

Introduction to Verilog HDL: VLSI Design Flow, Verilog as HDL, Levels of Design Description, Program structure, Language Constructs and Conventions, Different modeling methods and their language constructs with examples.

Unit II:

Introduction: Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS

Basic Electrical Properties: Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, Figure of merit ω_o; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

Unit III:

VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 μm CMOS Design rules.

Gate Level Design: Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

Unit IV:

Data Path Subsystems: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.

Array Subsystems: SRAM, DRAM, ROM, Serial Access Memories.

Unit V:

Programmable Logic Devices: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach, Parameters influencing low power design.

CMOS Testing: CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques.

Text Books:

1. 1. T.R. Padmanabhan, B Bala Tripura Sundari, Design through Verilog HDL, Wiley 2009.
2. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition
3. CMOS VLSI Design – A Circuits and Systems Perspective, Neil H. E Weste, David Harris, Ayan Banerjee, 3rd Ed, Pearson, 2009.

4. VLSI Design – M. Michael Vai, 2001, CRC Press.

Reference Books

1. Zainalabdien Navabi, Verliog Digital System Design,TMH, 2nd Edition.
2. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
3. CMOS logic circuit Design - John .P. Uyemura, Springer, 2007.
4. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
5. VLSI Design- K .Lal Kishore, V. S. V. Prabhakar, I.K International, 2009.
6. Introduction to VLSI – Mead & Convey, BS Publications, 2010.

Course Outcomes

Upon completion of the course students should be able to

CO1: Design digital applications using Verilog HDL

CO2: Understand IC technology and basic electrical properties of MOS and BiCMOS.

CO3: Design the layout of circuits using various design rules. Develop and design the gate level circuits

CO4: Gain the knowledge to design data path subsystems like Adders, Shifters, and ALUs etc.

CO5: Illustrate different programmable logic devices and CMOS testing.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ANTENNAS & WAVE PROPAGATION

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Electromagnetic Theory and Transmission Lines.

Course Objectives:

- Understand basic terminology and concepts of Antennas.
- To attain knowledge on the basic parameters those are considered in the antenna design process and the analysis while designing that.
- Analyze the electric and magnetic field emission from various basic antennas and mathematical formulation of the analysis.
- To have knowledge on antenna operation and types as well as their usage in real time field.
- Aware of the wave spectrum and respective band antenna usage and also to know the propagation of the waves at different frequencies through different layers in the existing layered free space environment structure.

Unit I

Antenna Fundamentals: Radiation mechanism-single wire, Two wire, Dipole and Current distribution on thin wire. Radiated field components -Hertizan dipole, Half wave dipole, Monopole antenna. Antenna Parameters- Radiation pattern, Beam width, Field region, Radiation power density, Directivity and gain, Bandwidth, Polarization, Input impedance, Efficiency, Antenna effective length and area, Antenna temperature.

Unit II

Design of Arrays: Linear Array - Two element array, N-element linear array- broadside array, End fire array- Directivity, radiation pattern. Pattern multiplication, Non-uniform excitation- Binomial array. Measurements – Radiation pattern- Gain- Directivity and Impedance measurements.

Unit III

Design of Antennas: Wire Antennas- long wire, V-Antenna, Rhombic antenna, helical antenna, folded dipole and their characteristics, Yagi-Uda antenna. Frequency independent antenna- Log periodic antenna. Aperture antennas – Horn antenna, parabolic reflector antenna, Micro strip antenna.

Unit IV

Wave Propagation - I: Propagation Mechanism- Reflection, Refraction and Transmission, Scattering and diffraction. Different Modes of Wave Propagation, Ground Wave Propagation (Quantitative Treatment) - Introduction, Plane Earth Reflections, Space and Surface Waves, Wave Tilt, Curved Earth Reflections, Space Wave Propagation - Introduction, Field Strength Variation with Distance and Height, Effect of Earth's Curvature, Absorption, Super refraction, Scattering Phenomena, Tropospheric Propagation.

Unit - V

Wave Propagation - II: Sky Wave Propagation - Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path, Critical Frequency, MUF, LUF, OF, Virtual Height and Skip Distance, Relation between MUF and skip Distance, Multi-hop Propagation ,Fading of signal .

Text Books

1. Antennas for All Applications – John D. Kraus and R. J. Marhefka, and Ahmad S. Khan TMH, New Delhi, 4th ed., (Special Indian Edition) 2010.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

Reference Books:

1. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
2. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
3. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th edition, 1955.
4. Antennas – John D. Kraus, McGraw-Hill (International Edition), 2nd Ed. 1988.
5. Antenna Theory - C.A. Balanis, John Wiley & Sons, 3rd ed., 2005.

Course Outcomes:

Upon completion of the course students should be able to

CO1: Define the parameters like antenna efficiency, beam efficiency, radiation resistance etc. in the design of an antenna.

CO2: Explain antenna arrays, illustrate antenna measurements and arrange a setup to carry out the antenna pattern measurements in the laboratory.

CO3: Understand the design issues and operation of fundamental antennas like Yagi-Uda, Frequency independent and Aperture antennas.

CO4: Classify the different wave propagation mechanisms, determine their characteristic features and estimate the parameters involved.

CO5: Analyze the structure of Ionosphere for the wave propagation and Solve problems on Critical frequency, Maximum usable frequency and Skip distance.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DESIGN OF FAULT TOLERANT SYSTEMS
(Professional Elective-II)

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To study about various faults, fault modeling, and testing techniques.
- To study the basic concepts of fault tolerance and to design circuits using various fault tolerant techniques.
- To study the concept of self checking in digital circuit testing process and to understand the concept of fails safe design.
- To study the concepts of testability.
- To study various standard test accessing methods for testing a circuit.

Unit I

Fault Modeling & Test Pattern Generation.

Logic Fault model: Fault detection & Redundancy, Fault equivalence and fault location, Fault dominance, Single stuck at fault model, Multiple stuck at fault models, Bridging fault model.

Fault diagnosis of combinational circuits by conventional methods: Path sensitization techniques, Boolean Difference method, Kohavi algorithm. Test algorithms: D-Algorithm, PODEM, Random testing, Transition count testing, Signature analysis.

Unit II

Fault Tolerant Design

Basic concepts: Reliability, Failures, and faults, Reliability and Failure rate, Relation between reliability and mean time between failure, Maintainability, Availability, Reliability of series, parallel and parallel-series combinational circuits.

Fault Tolerant Design: Static, Dynamic, and Hybrid modular redundant system, 5MR reconfiguration techniques, Data redundancy, Time redundancy and software Redundancy concepts.

Unit III

Self Checking circuits & Fail safe Design

Self Checking Circuits: Basic concepts of self checking circuits, Design of Totally self checking checker, Checkers using m out of n codes, Berger code, Low cost residue code.

Fail Safe Design: Strongly fault secure circuits, fail safe design of sequential circuits using partition theory and Berger code, totally self checking PLA design.

Unit IV

Design for Testability

Testability Measures: SCOAP testability, Controllability and observability, The Reed Muller's expansion technique, use of control and syndrome testable designs. High Level Testability Measures, Digital DFT and Scan Design: Ad-Hoc DFT Methods, Scan Design, Partial-Scan Design.

Built-In Self-Test: Random Logic BIST: Definitions, BIST Process, Pattern Generation, Response Compaction, Built-In Logic Block Observers, Test-Per-Clock, Test-Per-Scan BIST Systems, Circular Self Test Path System, Memory BIST, Delay Fault BIST.

Unit V

Standard IEEE Test Access Methods.

Boundary Scan Basics, Boundary scan architecture, Boundary scan Test Instructions-Mandatory instructions, Board level scan chain structures-One serial scan chain, various multiple-scan chain: with one

control test port, with one TDI, TDO but multiple TMS, Multiple-scan chain, multiple access port, RT Level boundary scan-inserting boundary scan test hardware for CUT, Two module test case, virtual boundary scan tester.

Textbooks:

- Parag K. Lala, "Fault Tolerant & Fault Testable Hardware Design", 1984, PHI.
- Zainalabedin Navabi, "Digital System Test and Testable Design using HDL models and Architectures", Springer International Edition.

References:

- Miron Abramovici, Melvin A. Breuer and Arthur D. Friedman, "Digital Systems Testing and Testable Design", Jaico Books.
- Bushnell & Vishwani D. Agarwal, "Essentials of Electronic Testing", Springer.
- Alfred L. Crouch, "Design for Test for Digital IC's and Embedded Core Systems", 2008, Pearson Education.

Course Outcomes:

Upon completion of the course students should be able to

CO1: Understand various concepts of Fault modeling, fault diagnosis, and test Pattern Generation.
CO2: Design fault tolerant systems based on modular redundancy techniques.
CO3: Gain knowledge of Basic concepts of self checking circuits and able to design fault safe circuits.
CO4: Understand the concepts of Design for Testability with various testability measures including BIST technique.
CO5: Study the various Standard IEEE Test Access Methods required for testing the digital circuits.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

FIBER OPTICAL COMMUNICATIONS
(Professional Elective-II)

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives

The objectives of the course are:

- To realize the significance of optical fiber communications.
- To understand the construction and characteristics of optical fiber cable.
- To develop the knowledge of optical signal sources and power launching.
- To identify and understand the operation of various optical detectors
- To understand the design of optical systems and WDM.

Unit I

Overview of Optical Fiber Communication: – Historical development, Advantages of Optical Fiber Communications, Optical Fiber Wave Guides- Introduction, Ray Theory Transmission, Total Internal Reflection, Acceptance Angle, Numerical Aperture, Skew Rays, Cylindrical Fibers- Modes, V-number, Mode Coupling, Step Index Fibers, Graded Index Fibers, Optical reflectance, Optical Absorption, Snell's law, Total Internal reflection in optical fibers.

Unit II

Signal Distortion in Optical Fibers: Attenuation, Absorption, Scattering and Bending Losses, Core and Cladding Losses, Information Capacity Determination, Group Delay, Types of Dispersion – Material Dispersion, Wave-Guide Dispersion, Optical Fiber Connectors- Connector Types, Single Mode Fiber Connectors, Connector Return Loss.

Unit III

Fiber Splicing: Splicing Techniques, Splicing Single Mode Fibers, Fiber Alignment and Joint Loss-Multimode Fiber Joints, Single Mode Fiber Joints, Optical Sources- LEDs, LASER diodes, Structures, Materials, Quantum Efficiency, Power, Modulation, Power Bandwidth Product, modulation in LED, stimulated emission and spontaneous emission,

Unit IV

Optical Detectors: Physical Principles of PIN and APD, quantum efficiency, responsivity, long wavelength cutoff, Detector Response Time, Temperature Effect on Avalanche Gain, Photo Detectors, photo detector noise, Optical Receiver Operation- Fundamental Receiver Operation,

Unit V

Optical System Design: Considerations, Component Choice, Multiplexing, Point-to- Point Links, System Considerations, Link Power Budget with Examples, Overall Fiber Dispersion In Multi-Mode and Single Mode Fibers, Rise Time Budget with Examples. Transmission Distance, Line Coding in Optical Links, WDM, Necessity, Principles, Types of WDM.

Text Books:

1. Optical Fiber Communications — Gerd Keiser, TMH, 4th Edition,2008.
2. Optical Fiber Communications — John M. Senior, Pearson Education, 3rdEdition, 2009.

Reference Books:

1. Fiber Optic Communications — D.K. Mynbaev, S.C. Gupta and Lowell L. Schemer, Pearson Education, 2005.
2. Text Book on Optical Fibre Communication and its Applications—S.C.Gupta, PHI, 2005.
3. Fiber Optic Communication Systems—GovindP.Agarwal, JohnWiley, 3rdEdition, 2004.
4. Introduction to Fiber Optics by Donald J.Sterling Jr. — Cengage learning,2004.
5. Optical Communication Systems — John Gowar, 2nd Edition, PHI,2001.

Course Outcomes

At the end of the course, the student will be able to

CO1: Understand and analyze the constructional parameters of opticalfibres.
CO2: Design an optical system.
CO3: Estimate the losses due to attenuation, absorption, scattering and bending.
CO4: Compare various optical detectors and choose suitable one for different applications.
CO5: Develop the concepts of optical system design.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DIGITAL IMAGE PROCESSING
(Professional Elective-II)

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Digital Signal Processing

Course Objectives

- To familiarize the students with digital image fundamentals.
- To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
- To learn concepts of degradation function and restoration techniques.
- To study the image segmentation and representation techniques.
- To Understand the concepts of image compression techniques.

Unit I

Digital Image Fundamentals & Image Transforms: Digital Image Fundamentals, Sampling and Quantization, Relationship between Pixels,

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

Unit II

Image Enhancement (Spatial Domain): Introduction, Image Enhancement in Spatial Domain: Enhancement through Point Operation, Types of Point Operation, Histogram Manipulation, Linear and Non — Linear Gray Level Transformation, Spatial domain filtering.

Image Enhancement (Frequency Domain): Low Pass (Smoothing) filters, High Pass (Sharpening) filters and Homomorphism filtering.

Unit III

Image Restoration: Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

Unit IV

Image Segmentation: Detection of Discontinuities, Edge Linking And Boundary Detection, Thresholding, Region based Segmentation.

Morphological Image Processing: Dilation and Erosion operations, Opening and Closing operations, Hit or Miss Transformation.

Unit V

Image Compression: Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

Text Books

1. Digital Image Processing – Rafael C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008
2. Fundamentals of Digital Image Processing — A.K.Jain, PHI, 1989

Reference Books

1. Digital Image Processing using MATLAB — Rafael C. Gonzalez, Richard E Woods and Steven L.Eddings, 2nd Edition, TMH, 2010.
2. Digital Image Processing- S Jayaraman, S Esakkirajan, T Veerakumar- TMH, 2010.
3. Digital Image Processing with MATLAB & Labview — Vipula Singh, Elsevier.

Course Outcomes

After completion of this course students will be able to

CO1: Gain the knowledge of digital image fundamentals and image transforms.
CO2: Understand image enhancement in spatial and frequency domain.
CO3: Understand the different methods to restore an image.
CO4: Analyze image segmentation techniques and morphological image processing techniques.
CO5: Analyze the different image compression techniques.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

RADAR SYSTEMS
(Professional Elective-III)

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Antennas and Wave Propagation

Course Objectives
- To Introduce Radar fundamentals and analysis of the radar signals.
- To understand various technologies involved in the design of radar transmitters and receivers.
- To learn various radars like MTI, Doppler and tracking radars and their comparison.

Unit I
Basics of Radar: Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications.
The Radar Equation : Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (simple targets – sphere, cone-sphere), Transmitter Power, PRF and Range Ambiguities, System Losses (qualitative treatment), Illustrative Problems.

Unit II
CW and Frequency Modulated Radar: Doppler Effect, CW Radar — Block Diagram, Isolation between Transmitter and Receiver, Receiver Bandwidth Requirements, Applications of CW radar. Illustrative Problems
FM-CW Radar: Range and Doppler Measurement, Block Diagram and Characteristics, FM-CW altimeter, Multiple Frequency CW Radar.

Unit III
MTI and Pulse Doppler Radar: Introduction, Principle, MTI Radar with – Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancelers - Blind Speeds, Double Cancellation, and Staggered PRFs. Range Gated Doppler Filters. MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler Radar.

Unit IV
Tracking Radar: Tracking with Radar, Sequential Lobing, Conical Scan, Monopulse Tracking Radar — Amplitude Comparison Monopulse (one- and two- coordinates), Phase Comparison Monopulse, Tracking in Range.

Unit V
Detection of Radar Signals in Noise: Introduction, Matched Filter Receiver – Response Characteristics and Derivation, Matched Fitter with Nonwhite Noise, Noise Figure and Noise Temperature.
Radar Receivers –Displays — types. Duplexers — Branch type and Balanced type. Circulators as Duplexers. Introduction to Phased Array Antennas – Basic Concepts, Radiation Pattern, Beam Steering and Beam Width changes, Applications. Advantages and Limitations.

Text Book
1. Introduction to Radar Systems — Merrill.I. Skolnik, TMH Special Indian Edition, 2nd Ed. 2007.

Reference Books
1. Radar Principles, Technology. Applications — Byron Edde, Pearson Education, 2004.
2. Radar Principles – Peebles. Jr., P.Z.. Wiley. New York, 1998.

3. Principles of Modern Radar: Basic Principles – Mark A. Richards, James A. Scheer, William A. HoIm.Yesdee, 2013

Course Outcomes

Alter completion of the course, the student will be able to

CO1: Illustrate the importance of radar fundamentals and analysis of the radar equation.
CO2: Understand the working principle of CW and FM-CW radar and its applications.
CO3: Understand the working principle of MTI and pulse Doppler radar.
CO4: Understand the different radar tracking methods.
CO5: Understand the radar receivers and also extraction of radar signal from noisy signal..

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

SPEECH PROCESSING
(Professional Elective-III)

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

This course

- Introduces Fundamentals of speech processing
- Is designed to give students the required knowledge about the properties of speech signal in time domain.
- Familiarizes the students with LPC parameters.
- Is designed to understand different speech and speaker recognition techniques,

Unit I

Speech Fundamentals: Articulatory Phonetics – Production and Classification of Speech Sounds; Acoustic Phonetics – Acoustics of speech production; Review of Digital Signal Processing concepts.

Unit II

Time Domain Models for Speech Processing: Introduction- Window considerations, Short time energy and average magnitude Short time average zero crossing rate, Speech vs Silence discrimination using energy and zero crossing, Pitch period estimation using a parallel processing approach.

Unit III

Linear Predictive Coding (LPC) Analysis: Basic principles of Linear Predictive Analysis: The Autocorrelation Method, The Covariance Method, and Solution of LPC Equations. Applications of LPC Parameters: Pitch Detection and Formant Analysis using LPC Parameters.

Unit IV

Homomorphic Speech Processing: Introduction, Homomorphic Systems for Convolution, Computational Considerations, the Complex Cepstrum of Speech, Pitch Detection, Formant Estimation, The Homomorphic Vocoder. Speech Enhancement: Nature of interfering sounds, Speech enhancement techniques: Single Microphone Approach, spectral subtraction.

Unit V

Automatic Speech & Speaker Recognition: Basic pattern recognition approaches, Parametric representation of speech, Evaluating the similarity of speech patterns.

Hidden Markov Model (HMM) for Speech: Hidden Markov Model (HMM) for speech recognition, Viterbi algorithm. Speaker Recognition: Recognition techniques, Features that distinguish speakers, Speaker Recognition Systems: Speaker Verification System, Speaker Identification System.

Text book:

1. Digital Processing of Speech Signals - L.R. Rabiner and S. W. Schafer. Pearson Education.
2. Speech Communications: Human & Machine - Douglas O'Shaughnessy, 2nd Ed., Wiley India, 2000.
3. Digital Processing of Speech Signals. L.R Rabinar and R W Jhaung, 1978, Pearson Education.

Reference book:

1. Discrete Time Speech Signal Processing: Principles and Practice - Thomas F. Quateri, 1st Ed., PE.
2. Speech & Audio Signal Processing- Ben Gold & Nelson Morgan, 1st Ed., Wiley.

Course Outcomes

Upon completion of the course students should be able to

CO1: Learn the fundamentals of digital speech processing

CO2: Demonstrate the different time domain models of speech processing.

CO3: Understand the concepts of linear predictive coding for speech processing.

CO4: Analyze the different techniques of speech processing

CO5: Make use of different speech and speaker recognition techniques and Hidden Markov model for speech processing.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MACHINE LEARNING
(Professional Elective-III)

B. TECH – VI Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.
- To be able to read current research papers and understands the issues raised by current research.

Unit I:

The ingredients of machine learning, Tasks: the problems that can be solved with machine learning, Models: the output of machine learning, Features: The workhorses of machine learning. Binary classification and related tasks: Classification, Scoring and ranking.

Unit II:

Beyond binary classification: Handling more than two classes, Regression, Unsupervised and descriptive learning. Concept learning: The hypothesis space, Paths through the hypothesis space.

Unit II:

Models: Decision trees, Ranking and probability estimation trees, Tree learning as variance reduction. Rule models: Learning ordered rule lists, Learning unordered rule sets, Descriptive rule learning, First-order rule learning

Unit IV:

Linear models: The least-squares method, The perceptron: a heuristic learning algorithm for linear classifiers, Support vector machines. Distance Based Models: Introduction, Neighbours and exemplars, Distance Based Clustering, Hierarchical Clustering.

Unit V:

Probabilistic models: The normal distribution and its geometric interpretations, Probabilistic models for categorical data, Probabilistic models with hidden variables. Features: Kinds of feature, Feature transformations, Feature construction and selection.

Text Books:

1. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
2. Machine Learning, Tom M. Mitchell, MGH.

Reference Books:

1. Understanding Machine Learning: From Theory to Algorithms, Shai Shalev-Shwartz, Shai Ben- David, Cambridge.
2. Machine Learning in Action, Peter Harington, 2012, Cengage.

Course Outcomes:

After the completion of this course the students should be able to

CO1: Discuss different application on Machine Learning problems.
CO2: Describe various algorithms on Machine Learning mentioning its strengths and weaknesses.
CO3: Illustrate the basic theory focused on Machine Learning models and Learning Techniques.
CO4: Improve the performance of Machine Learning algorithms with different parameters.
CO5: Analyze Probabilistic models and features of Machine Learning.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
VLSI & e-CAD LAB

B. TECH – VI Semester **L/T/P/C**
0/0 /2 /1

Pre Requisites: None

Course Objectives:

- This course presents the design and implementation of digital circuits at different levels of designing.

List of Experiments

Design and implementation of the following CMOS digital/analog circuits using **Cadence / Mentor Graphics / Synopsys /Equivalent** CAD tools. The design shall include Gate-level design, Transistor-level design, Hierarchical design, Verilog HDL design, Logic synthesis, Simulation and verification, Scaling of CMOS Inverter for different technologies, study of secondary effects (temperature, power supply and process corners), Circuit optimization with respect to area, performance and/or power, Layout, Extraction of parasitic and back annotation, modifications in circuit parameters and layout consumption, DC/transient analysis, Verification of layouts (DRC, LVS)

E-CAD programs:

Programming can be done using any complier. Download the programs onto FPGA/CPLD boards and perform logical verification physically on board apart from verification by simulation with any of the front end tools.

1. To realize and verify the logic gates using Verilog.
2. To Design and verify 2-to-4 decoder.
3. To Design and verify 8-to-3 encoder (without and with priority)
4. To Design and verify 8-to-1 multiplexer and 1-to-8 Demultiplexers
5. To Design and verify 4 bit binary to gray code converter
6. To Design and verify 4 bit comparator
7. To Design and verify Full adder using 3 modelling styles
8. To Design and verify flip flops: SR, D, JK, T
9. To Design and verify 4-bit binary, BCD counters (synchronous/ asynchronous reset) or any sequence counter
10. Realization of any Finite State Machine using Verilog.

VLSI programs:

- Introduction to schematic design entry with layout, physical verification, placement & route for complex designs, static timing analysis of the following:
  1. To design and verify CMOS circuit structures for Gates such as AND,OR, NAND, NOR and Inverter.
  2. To design and verify different CMOS logic circuits of adders like Complementary pass transistor logic, transmission gate logic.
  3. To design and verify CMOS Multiplexer and Encoder:
  4. To design and verify CMOS Latch and Flip flop (Any one Type).
  5. Layout of any combinational circuit (complex CMOS logic gate).
  6. Analog Circuit simulation (AC analysis) – CS & CD amplifier.

Note: *Any* ***SIX of*** *the above experiments from each part are to be conducted (Total 12)*

Course Outcomes:

Upon completion of this Lab students should be able to

CO1: Acquire knowledge on High end Simulation tools like Mentor Graphics, Tanner EDA etc.

CO2: Design digital circuits at different levels using programming concepts.

CO3: Implement any type of digital systems.

CO4: Program any available FPGA and CPLD using implementation tool.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MICROPROCESSORS & MICROCONTROLLERS LAB

B. TECH – VI Semester **L/T/P/C**
0/0 /2 /1

Pre Requisites: None

Course Objectives:

- Outline the history of computing devices.
- To develop an in-depth understanding of the architecture operation of 8086 microprocessors.
- To develop an in-depth understanding of the architecture operation of 8051 microprocessors.
- To understand machine language programming & interfacing techniques.

Note: Minimum of 12 experiments are to be conducted.
The following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

List of Experiments:

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessors using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify Timer/ Counter in 8051.
12. Program and verify Interrupt handling in 8051
13. UART Operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/ Keyboard to 8051.
17. Data Transfer from Peripheral to Memory through DMA controller 8237 / 8257.

Course Outcomes

Upon completion of this Lab students should be able to
CO1: Demonstrate experimentally basic programming of Microprocessor.
CO2: Recall the microprocessor interfacing with various peripherals for various applications.
CO3: Apply the basic programming of microcontroller.
CO4: Examine microprocessor interfacing with various peripherals for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROJECT BASED LEARNING-4

B. TECH – VI Semester **L/T/P/C**
0/0 /2/1

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

LOGICAL REASONING AND QUANTATIVE APTITUDE

B. TECH – VI Semester **L/T/P/C**
2/ 0 /0/ 0

Pre-requisites: None
Course Objectives:

To learn

- To improve logical thinking with general applications using mathematical concepts like sequences, series, number theory and probability.
- It also features students to analyze data interpretation and able of improve their mathematical skills in various general aspects like coding and decoding, Time and Work puzzles solving blood relations etc.

Unit – I: Logical Reasoning

1. Coding and Decoding
2. Distance and Directions
3. Classifications
4. Odd man out and series
5. Clocks and Calendars etc.

Unit – II: Logical ability

1. Blood relations
2. Seating Arrangements
3. Figure Analysis
4. Puzzles etc.

Unit – III: Number systems

1. LCM and HCF
2. Ratio and proportion
3. Simple interest and compound interest
4. Profit and Loss etc.

Unit – IV: Arithmetic ability

1. Time and work
2. Partnerships
3. Time speed and distance
4. Problems on Trains etc.

Unit – V: Mathematical ability

1. Sequence and series
2. Permutations and combination
3. General probability etc.

Reference Books:

1. A modern approach to verbal and non-verbal reasoning by Dr. R.S. Aggarwal.
2. Quantitative Aptitude by Abhijit Guha Tata McGraw-Hill Company Limited.
3. Quantitative Aptitude by P.A. Anand (Wiley)

4. Quantitative Aptitude by Dr. R.S. Agarwal.
5. Objective Arithmetic by S.L. Gulati.

Course Outcomes

Upon completion of this course, students will be able to:

CO1: Apply quantitative reasoning and mathematical analysis methodologies to understand and solve problems.

CO2: Apply quantitative correctly arrive at meaningful conclusions regarding their answers and manipulate equations and formulas in order to solve for the desired variable

CO3: Interpret given information correctly, determine which mathematical model best describes the data, and apply the model correctly.

CO4: Correctly apply mathematical language and notation to explain the reasoning underlying their conclusions when solving problems using mathematical or statistical techniques.

CO5: Improve their mathematical skills in various general aspects to solve real time problems.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MICROWAVE ENGINEERING

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Antennas & Wave Propagation

Course Objectives

The objectives of the course are: Enable the students

- To develop the knowledge on transmission lines for microwaves.
- To study cavity resonators ,wave guide components and scattering matrix parameters.
- To understand and analyze the operation of Microwave tubes .
- To familiarize with microwave solid state devices.
- To understand the microwave test bench

Unit I

Microwave Transmission Lines - I: Introduction, Microwave Spectrum and Bands, Applications of Microwaves, Rectangular Waveguides – Solution of Wave Equations in Rectangular Coordinates, TE/TM mode analysis, Expressions for Fields, Characteristic Equation and Cut-off Frequencies, Dominant mode Mode Characteristics – Phase and Group Velocities, Wavelengths and Impedance Relations, Illustrative Problems. Rectangular Guides - Power Transmission and Power Losses, Impossibility of TEM Mode.

Unit II

Cavity Resonators– Introduction, Rectangular Cavities, Resonant Frequencies, Q Factor and Coupling Coefficients, Illustrative Problems.

Waveguide Components and Applications: Matched Loads, Waveguide Attenuators – Different Types, Resistive Card and Rotary Vane Attenuators; Waveguide Phase Shifters –Types, Dielectric and Rotary Vane Phase Shifters.

Scattering Matrix– Significance, Formulation and Properties, S Matrix Calculations for – 2 port Junctions, E plane and H plane Tee, Magic Tee, Directional Couplers ,Illustrative Problems

Ferrites– Composition and Characteristics, Faraday Rotation, Ferrite Components – Gyrator, Isolator, Circulator.

Unit III

Microwave Tubes: Limitations and Losses of conventional Tubes at Microwave Frequencies, Microwave Tubes – O Type and M Type Classifications, O-type Tubes : 2 Cavity Klystrons ,Reflex klystron– Structure, Velocity Modulation and Applegate Diagram, Bunching Process– Expressions for O/P Power and Efficiency. Effect of Repeller Voltage on Power O/P, Illustrative Problems.

Helix TWTs: Significance, Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process, Gain Considerations.

M-Type Tubes:

Introduction, Cross-field Effects, Magnetrons — Hull Cut-off and Hartree Conditions, Modes of Resonance and PI-Mode Operation, Separation of PI-Mode, Illustrative Problems.

Unit IV

Microwave Solid State Devices: Introduction, Classification, Applications. TEDs – Introduction, Gunn Diodes – Principle, RWH Theory, Characteristics, Basic Modes of Operation - Gunn Oscillation Modes, Introduction to Avalanche Transit Time Devices.

UNIT V

Microwave Measurements: Description of Microwave Bench – Different Blocks and their Features, Errors and Precautions, Microwave Power Measurement, Bolometer. Measurement of Attenuation, Frequency,

Standing Wave Measurements – Measurement of Low and High VSWR, Cavity Q, Impedance Measurements.

Text Books

1. Microwave Devices and Circuits – Samuel Y. Liao, Pearson, 3rd Edition, 2003.
2. Microwave Principles – Herbert J. Reich, J.G. Skalnik, P.F. Ordung and H.L. Krauss, CBS Publishers and Distributors, New Delhi, 2004.

References Books

1. Foundations for Microwave Engineering – R.E. Collin, IEEE Press, John Wiley, 2nd Edition, 2002.
2. Microwave Circuits and Passive Devices – M.L. Sisodia and G.S.Raghuvanshi, Wiley Eastern Ltd., New Age International Publishers Ltd., 1995.
3. Microwave Engineering Passive Circuits – Peter A. Rizzi, PHI, 1999.
4. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th Ed., 1955.
5. Microwave Engineering – A. Das and S.K. Das, TMH, 2nd Ed., 2009.

Course Outcomes

Upon completion of the course, the students will be able to

CO1: Understand the significance of microwaves and microwave transmission lines.
CO2: Identify the different wave guide components and applications
CO3: Analyze the characteristics of various microwave tubes.
CO4: Learn the different types of microwave solid state devices.
CO5: Gain knowledge of microwave Measurement.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

EMBEDDED SYSTEMS

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre-Requisites: Microprocessors & Microcontrollers

Course Objectives

For embedded systems, the course will enable the students to:

- Understand the basics of an embedded system
- Understand the architecture of ARM Processor, instruction set and assembly language programming
- To Introduce I/O devices, Bus Communication in processors, Input/output interfacing
- Understand the Memory Interfacing, Memory selection for Embedded Systems
- Design, implement and test an embedded system

Unit I

Introduction to Embedded Systems: Definition of Embedded System, Embedded Systems Vs General Computing Systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics of Embedded Systems, the History of ARM and Microcontrollers.

Unit II

ARM 32 Bit MCU's: Introduction to 16/32 Bit processors, ARM architecture and organization, ARM / Thumb programming model, ARM / Thumb instruction set ,differences between ARM and Thumb instruction set, ARM assembly language programming, ARM development tools.

LPC2148 ARM CPU'S: Features, pin configuration, block diagram, memory mapping, and applications.

Unit III

LPC2148 Peripherals: GPIO-Features, applications, timer/counter, PWM, ADC, DAC, Real time clock, watch dog timer, displays.

Communication Interface: Onboard Communication Interfaces: I2C, SPI, UART, Parallel interface, External Communication Interfaces: RS232, USB, IEEE1394 (Fire wire), Infrared Devices, Bluetooth, Zig Bee, Wi-Fi, GPRS

Unit IV

Typical Embedded System: Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off- The-Shelf Components (COTS), Memory: ROM, RAM, Memory according to the type of Interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators.

Unit V

Embedded Firmware: Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Embedded Firmware Design Approaches and Development Languages.

Text Book

1. Introduction to Embedded Systems – Shibu K.V, Mc Graw Hill.
2. Architecture, Programming, interfacing and system design-Raj Kamal, Pearson Education
3. ARM Assembly Language Programming and Architecture-Muhammad Ali Mazidi,Sarmad Naimi,Sepehr Naimi,Janice Mazidi

Reference Books

1. Philips semiconductors UM10139 Vol.01 :LPC214X User Manual
2.Embedded Systems Raj Kamal, TMH

Course Outcomes

Upon completion of this course, the student will be able to:

CO1: Understand and design embedded systems.
CO2: Understand the architecture of Arm processors.
CO3: Develop a system using IO devices and interfacing to external world.
CO4: Understand types of memory.
CO5: Understand embedded firmware design approaches.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

WIRELESS AND MOBILE COMMUNICATION
(Professional Elective-IV)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives

- To provide the student with an understanding of the Cellular concept, Frequency reuse, Hand-off strategies.
- To enable the student to analyze and understand wireless and mobile cellular communication systems over a stochastic fading channel
- ToprovidethestudentwithanunderstandingofCo-channelandNon-Co-channelinterference
- To give the student an understanding of cell coverage for signal and traffic, diversity techniques and mobile antennas.
- To give the student an understanding of frequency management, Channel assignment and types of hand off.

Unit I

Introduction to Cellular Mobile Radio Systems: Limitations of Conventional Mobile Telephone Systems, Basic Cellular Mobile System, First, Second, Third and Fourth Generation Cellular Wireless Systems, Uniqueness of Mobile Radio Environment- Fading, Coherence Bandwidth, Delay Spread, Doppler Spread and Coherence Time. Fundamentals of Cellular Radio System Design: Concept of Frequency Reuse, Co-Channel Interference, Co-Channel Interference Reduction Factor, Desired C/I From a Normal Case in a Omni Directional Antenna System, Trunking and Grade of Service, ImprovingCoverageandCapacityinCellularSystems-CellSplitting,Sectoring,MicrocellZoneConcept.

Unit II

Co-Channel Interference: Measurement Of Real Time Co-Channel Interference, Design of Antenna System, Diversity Techniques-Space Diversity, Polarization Diversity, Frequency Diversity, Time Diversity, Directional Diversity. Non-Co-Channel Interference: Adjacent Channel Interference, Near End Far End Interference, Cross Talk, Effects on Coverage and Interference by Power Decrease, Antenna Height Decrease, Effects of Cell Site Components.

Unit III

Cell Coverage for Signal and Traffic: Signal Reflections in Flat and Hilly Terrain, Effect of Human Made Structures, Phase Difference Between Direct and Reflected Paths, Constant Standard Deviation, Straight Line Path Loss Slope, General Formula for Mobile Propagation Over water and Flat Open Area, Near and Long Distance Propagation, Path Loss From a Point to Point Prediction Model in Different Conditions, Merits of Lee Model. Cell Site and Mobile Antennas: Space Diversity Antennas, Umbrella Pattern Antennas.

Unit IV

Frequency Management and Channel Assignment: Numbering and Grouping, Access and Paging Channels, Channel Assignments to Cell Sites and Mobile Units, Channel Sharing and Borrowing, Sectorization, Overlaid Cells, Non Fixed Channel Assignment.

Unit V

Handoffs and Dropped Calls: Handoff Initiation, Types of Handoff, Delaying Handoff, Advantages of Handoff, Power Difference Handoff, Forced Handoff, Mobile Assisted and Soft Handoff, inter system Handoff, Introduction to Dropped Call Rates and their Evaluation.

Text Books

1. MobileCellularTelecommunications—W.C.Y.Lee,McGrawHill,2ndEdn.,1989.
2. Wireless Communications – Theodore. S. Rapport, Pearson Education, 2nd Edn.,2002.
3. Mobile Cellular Communication – Gottapu sashibhushana Rao, Pearson,2012.

Reference Books

1. PrinciplesofMobileCommunications—GordonL.Stuber,SpringerInternational,2ndEdn.,2001.
2. Modern Wireless Communications-Simon Haykin, Michael Moher,Pearson Education,2005.
3. Wireless Communications Theory and Techniques, Asrar U. H .Sheikh, Springer, 2004.
4. Wireless Communications and Networking, Vijay Garg, Elsevier Publications,2007.
5. Wireless Communications —Andrea Goldsmith, Cambridge University Press,2005.

Course Outcomes

By the end of the course, the student will be able to

CO1: Estimate the impairments due to multi path fading channel.
CO2: Explain an Importance of the fundamental techniques to overcome the different fading effects.
CO3: Distinguish the co-channel and Non co-channel interference.
CO4: Inspect cell coverage for signal and traffic, diversity techniques and mobile antennas.
CO5: Relate and explain the functioning of frequency management, Channel assignment and types of handoff.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CMOS CIRCUIT DESIGN
(Professional Elective-IV)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: VLSI Design

Course Objectives:

- To introduce the fundamentals of VLSI design flow& interchange formats of VLSI design tools
- To understand the circuit characterization & its performance estimation
- To study the combinational circuit design using various circuit families in VLSI
- To understand the sequential circuit design in VLSI
- To introduce BiCMOS circuits & Low Power CMOS Logic Circuits

Unit I

VLSI Design Flow: Design Specification, Design Entry, Functional Simulation, Planning Placement and Routing, Timing Simulation, Fusing/Fabrication into the chip. Fabrication, Packaging and Testing.

Design Methodologies & Tools: DESIGN FLOWS: Automated Layout Generation, Mixed signal or Custom Design Flow and Programmed Behavioral Synthesis

Interchange Formats: GDS2 Stream, Caltech Intermediate Format, Design Exchange Format, Standard Delay Format, DSPF, SPEF, Advanced Library Format, WAVES Waveform and Vector Exchange Format, Physical Design Exchange Format, Open Access

Unit II

Circuit Characterization & Performance Estimation: Introduction, Delay Estimation, Logical Effort and Transistor sizing, Power Dissipation, Interconnect, Design Margin.

Unit III

Combinational Circuit Design: Introduction, Circuit Families: Static CMOS, Ratioed Circuits, CVSL, Dynamic Circuits, Pass Transistor circuits Comparison of Circuit Families.

Unit IV

Sequential Circuit Design: Introduction, Sequential Static Circuits, Circuit Design of Latches and Flip flops, Static sequencing Element Methodology

Unit V

BiCMOS Logic Circuits: BiCMOS Circuits: Static Behavior& Switching Delay in CMOS Circuits, BiCMOS Applications

Low Power CMOS Logic Circuits: Introduction, Overview of power consumption, Low power design through voltage scaling, Estimation and Optimization of switching activity, Reduction of switched capacitance, clock gating, gdi logic, Adiabatic Logic

Textbooks:

1. CMOS VLSI Design- Neil H.E. Weste, David Harris & Ayan Banerjee, Third Edition, Pearson.
2. CMOS Digital Integrated Circuits–Sung Mo Kang, Yusuf Leblebici,Third Edition, TMH.

Reference books:

1. CMOS : Circuit Design, Layout & Simulation – R.Jacob Baker, Wiley
2. Digital Integrated Circuits – Jan M. Rabaey, P Chandrakasan, Pearson Education

Course Outcomes

At the end of course the students will be able to

CO1: Understand the fundamentals of VLSI design flow & interchange formats of VLSI design tools.

CO2: Develop the understanding to analyze circuit characterization & its performance estimation.

CO3: Develop the understanding to analyze the combinational circuit design using various circuit families In VLSI.

CO4: Apply the knowledge of sequential circuit design in VLSI for various design applications.

CO5: Analyze low power design strategies suitable for various design applications in VLSI.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ARTIFICIAL INTELLIGENCE
(Professional Elective-IV)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Basics of Programming, Basics of probability theory

Course Objectives

- To Understand Problem State space and Search Techniques.
- To analyse Issues related to Knowledge and its representation.
- To analyse various structures of data.
- To Understand the Natural language processing.
- To understand working of Expert Systems.

Unit I

Introduction to Artificial Intelligence: The AI problem domains, The underlying assumption, An AI technique, The level of the model, Criteria for success.

Problems, Problem Spaces and Search: Defining the problem as a state space search, Production systems, Problem characteristics, Issues in the design of search programs.

Heuristic Search Techniques: Generate-and-Test, Hill climbing, Best-first-search, Problem reduction.

Unit II

Knowledge Representation Issues: Knowledge representations and mappings, Approaches to knowledge representation, The Frame problem.

Using Predicate Logic: Propositional Calculus, First order predicate calculus(FOPC), Syntax and semantics of FOPC **,** Computable functions , Resolution,

Representing Knowledge Using Rules: Procedural versus Declarative knowledge, Forward versus Backward Reasoning.

Unit III

Weak slot and filler structures: Semantic nets, Frames.

Strong slot and filler structures: Conceptual Dependencies, Scripts.

Game Playing: The Minimax Search procedure, Adding Alpha-Beta Cutoffs.

Unit IV

Reasoning in Uncertain Situations: Introduction, Logic-Based Abductive Inference, Abduction - Alternative to Logic.

Understanding Natural Language: Role of Knowledge in Language Understanding, Deconstructing Language - A Symbolic Analysis, Syntax, Natural Language Applications.

Unit V

Strong Method Problem Solving: Overview of Expert System Technology, Rule-Based Expert Systems, Model-Based, Case Based and Hybrid Systems, Introduction to Prolog-The Natural Language of Artificial Intelligence.

Text books

1. Elaine rich, Kevin knight, Shivashanker B Nair "Artificial Intelligence", 3rd Edition, Tata McGraw- Hill, ISBN No: 9780070087705, 0070087709, 2012.
2. George F Luger, "Artificial Intelligence", Fifth Edition, Pearson Education Asia., ISBN No: 9788131723272, 2012.

Reference books

1. Rajendra Akerkar, "Introduction to Artificial Intelligence", Second Edition 2014, PHI Learning, ISBN No: 978-81-203-4997-1.
2. R.B. Mishra "Artificial Intelligence", PHI Learning, ISBN No: 978-81-203-3849-4, 2010.

Course Outcomes

Upon completion of course, the student will be able to learn the following

CO1: Remember various AI concepts like the AI technique, level of models, there underlying assumptions etc

CO2: Understand the concepts of AI search techniques

CO3: Apply knowledge Representation techniques

CO4: Analyze different structures of representation

CO5: Evaluate AI search techniques, Create Expert systems

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

SENSOR NETWORKS
(Professional Elective-V)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To introduce the various types of sensor & networks in wireless
- To explore the analysis of various sensors & networks

Unit I

Overview of Wireless Sensor Networks: Challenges for Wireless Sensor Networks, Enabling Technologies for Wireless Sensor Networks.

Unit II

Architectures: Single-Node Architecture-Hardware Components, Energy Consumption of Sensor Nodes , Operating Systems and Execution Environments, Network Architecture - Sensor Network Scenarios, Gateway Concepts.

Unit III

Networking Sensors: Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts -S-MAC , The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses.

Unit IV

Infrastructure Establishment: Topology Control, Clustering, Time Synchronization, Localization and Positioning**.**

Unit V

Sensor Network Platforms and Tools: Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-levels of twareplat forms, Node-level Simulators**.**

Text books:

1. HolgerKarl&AndreasWillig,"ProtocolsAndArchitecturesforWirelessSensorNetworks", John Wiley,2005.
2. Feng Zhao &Leonidas J. Guibas, ‐Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.

Reference books:

1. Kazem Sohraby, Daniel Minoli, &Taieb Znati, ‐Wireless Sensor Networks- Technology, Protocols, And Applications‖,JohnWiley, 2007.
2. AnnaHac, ‐Wireless Sensor Network Designs‖, John Wiley, 2003.

Course Outcomes

At the end of the course, the student will be able to

CO1: Understand the overview of sensor &networks.
CO2: Explore the various architectures of sensors & network
CO3: Uunderstand the various protocols in sensor networks.
CO4: Identify the infrastructure and establishment of sensor networks.
CO5: Explore various sensor network platforms and tools.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

SATELLITE COMMUNICATION
(Professional Elective-V)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

The objectives of the course are: Enable the students

- To study about Satellite systems and satellite orbits .
- To study about space segment and link design procedures.
- To Study about various multiplexing and multiple access techniques.
- To study about Earth Segment, Test equipment measurements, Communication satellites.
- To study various applications of satellites .

Unit I

Satellite Orbits And Trajectories: Introduction, Types of Satellite orbits (geo stationary and non-geo stationary orbits), Orbital parameters , Kepler's Laws, velocity of satellite in circular orbit, Orbital perturbations, calculation. Orbital effects on satellite's performances, Look angles: Azimuth angle, Elevation angle, rocket equation.

U**nit II**

Space Segment And Satellite Link Design: Spacecraft Technology - Structure, Attitude and Orbit control, Satellite stabilization, Communication payload and subsystems TTC. Satellite uplink and downlink Analysis and Design, C/No, EIRP, Transmission Equation, link equation ,System noise temperature calculations and Problems.

Unit III

Satellite Access: Modulation and Multiplexing: FDM, TDM, Multiple access techniques: FDMA, TDMA, CDMA ,SDMA, inter modulation and interference, Spread spectrum communication-FHSS, DSSS.

Unit IV

Earth Segment And Communication Satellites: Earth Station Technology, Types of earth station, Architecture, Satellite tracking, Terrestrial Interface, Transmitter and Receiver, Antenna Systems, Test Equipment Measurements on G/T.

Unit V

Satellite Applications: Satellite Vs. Terrestrial Networks, Satellite Telephony, Satellite Television, VSAT and GPS system.

Text Book

1. Satellite Communications Systems: Systems, Techniques and Technology, 5th edition, by G. Maral, M. Bousquet, Z. Sun, Publisher: John Willy and sons, 2010, ISBN: 978-0-470-71458-4
2. Satellite Communication Engineering, 2nd edition, CRC Press, by M.O. Kolawole, 2017.

References Book

1. Global Mobile Satellite Communications Applications: For Maritime ..., Volume 2, By Stojce Dimov Ilcev, Publisher: Springer, 2017.
2. Timothy Pratt – Charles Bostian & Jeremy Allnutt, Satellite Communications, John Willy & Sons (Asia) Pvt. Ltd, 2nd Edition 2004.

Course Outcomes

Upon completion of the course, the students will be able to

CO1: Understand the historical background, basic concepts and frequency allocations for satellite

Communication.

CO2: Understand the satellite sub systems like Telemetry, tracking, command and monitoring power system.etc.

CO3: Understand various Satellite Multiple Access techniques

CO4: Understand the earth station technology and terrestrial interface networks.

CO5: Understand the applications of Satellites and GPS system.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ROBOTICS AND AUTOMATION
(Professional Elective-V)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

The primary Objectives of this course are-

- To introduce the basic fundamentals of robotics and its different components.
- To Understand about power sources and different sensors used in robotics.
- To explain the design concepts of manipulators, Actuators and Grippers.
- To introduce the AVR microcontroller and its programming concepts.

Unit I

Introduction to Robotics

Definition and origin of robotics, various generations of robots, Applications of robotics in automation, Fixed versus flexible automation, Degrees of freedom, Basic components of a robot system and its description, An implementation of a robot controller, Specifications of a Robot System.

Unit II

Power sources and sensors

DC Motor, Servo Motor Modelling of DC servo motor, Stepper Motor, , Principles of stepper motor operation, Half step mode operation, Microstep mode, Speed and direction control and circuitry of motors, Sensors for localization, navigation, obstacle avoidance and path planning.

Unit III

Manipulators, Actuators and Grippers

Manipulators, Electronic manipulator control circuit, Resolution Repeatability and Accuracy of a manipulator, lagrangian Analysis of manipulator, Actuators, Direct drive actuator, Gripping Problem, Gripper and their design considerations, Robot cell design, Selection of robot.

Unit IV

Introduction to AVR Microcontroller

Overview of AVR family, AVR microcontroller architecture, Status register, Special function register, On-chip peripherals, ATMEGA-32 pin description, AVR data types and assembler directives, Addressing modes of AVR, data transfer, Arithmetic and logic, Rotate and shift, Branch and cell instructions.

Unit V

Programming with AVR

AVR studio setup for assembly language programming, AVR I/O port programming, Time delay loop, Look-up table, Bit addressability, intel Hex file, UART serial communication protocol, Peripheral interfacing, LCD and keyboard interfacing, stepper and DC motor control.

Text Books

1. Richard David Klafter, Thomas A. Chmielewski, Michael Negin, Robotic engineering: an integrated approach, Prentice Hall, 1989
2. Craig, J. J., Introduction to Robotics: Mechanics and Control, 2nd Edition, Addison-Wesley, 1989
3. The AVR Microcontroller and Embedded Systems Using Assembly and C, By Muhammad Ali Mazidi, Sarmad Naimi and Sepehr Naimi, Pearson Education.

4. Programming and Customizing the AVR Microcontroller, By Dhananjay Gadre, McGraw Hill Education

Course Outcomes

Upon completion of this syllabus, students will be able to-

CO1: Understand the basic components and specifications used in robotics and automation.

CO2: Understand and implement the different types of motors and sensors during designing of robotics system.

CO3: Use manipulators, Actuators and Grippers and their design considerations in robotics and automation.

CO4: Understand the basic concepts of AVR microcontrollers.

CO5: Implement the programming and interfacing concepts of AVR microcontroller in robotic designing.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(Open Elective-I)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Note: Students should take open electives from the list of open electives offered by the other departments/branches only.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MICROWAVE ENGINEERING LAB

B. TECH – VII Semester **L/T/P/C**
0/0 /2 /1

Pre Requisites: None

Course objectives:

- This course presents the practice of microwave engineering components characteristics measurements of different parameters.

Minimum of 10 experiments to be performed
1. Reflex Klystron Characteristics
2. Gunn Diode Characteristics
3. Directional Coupler Characteristics
4. VSWR Measurement
5. Measurement of Waveguide Parameters
6. Measurement of Impedance of a given Load
7. Measurement of Scattering Parameters of a Magic Tee
8. Measurement of Scattering Parameters of a Circulator
9. Attenuation Measurement
10. Microwave Frequency Measurement
11. LASER diode characteristics.
12. LED characteristics
13. Study of fiber optic communication link.

Course outcomes:
After completion of this Lab the students must be able to know the following.
CO1: Demonstrate a microwave bench for measuring microwave parameters.
CO2: Measure parameters like attenuation, VSWR, etc.,
CO3: Gain knowledge about Various components used for Microwave communication and their applications
CO4: Analyze the characteristics of all microwaves engineering component.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

EMBEDDED SYSTEMS LAB

B. TECH – VII Semester **L/T/P/C**
0/0 /2 /1

Pre-requisites: Microprocessors and Microcontrollers Lab

Course Objectives:

- To develop an in-depth understanding of the operation of microcontrollers, machine language programming & interfacing techniques.
- Learn the working principle and programming concepts of ARM processor
- To provide the student with in-depth knowledge of embedded systems including overall system design, and interfacing.

Minimum of 12 experiments to be performed

1. Write a program to Blink LED's with some time delay using 8051 Microcontroller.
2. Write a program to transfer message "YES" serially at 9600 baud rate with 8-bit data, asynchronous data.
3. Write a program to Encrypt and Decrypt the string
4. Reading inputs from Switches
5. Study of ARM Evaluation system
6. Write a program to toggle all the LED to port and with some time delay using ARM7
7. LCD interface with ARM7
8. Interfacing 4*4 matrix keypad with ARM7
9. Interfacing Stepper motor with ARM7
10. Interfacing LED, PWM & Verify the output in ARM7
11. Interfacing ADC
12. Interfacing DAC
13. Interfacing DC Motor.
14. Interfacing real time clock
15. Interfacing temperature sensor
16. Implementing Zig bee protocol with ARM

Course outcomes:

After completion of this Lab the students should be able to

CO1: Develop the programming concepts of 8bit, 16bit, and 32 bit micro controllers

CO2: Understand working principle and programming concepts of ARM processor

CO3: Understand types of memory, interacting to external world and

CO4: Analyze the different I/O devices and their interfacing concepts, understand the concepts of real time applications.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MINI PROJECT & INTERNSHIP

B. TECH – VII Semester **L/T/P/C**
0/0 /4 /2

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROJECT PHASE – I

B. TECH – VII Semester **L/T/P/C**
0/0 /8 /4

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DIGITAL SIGNAL PROCESSOR & ARCHITECTURE
(Professional Elective-VI)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: Digital Signal Processing

Course Objectives

The objectives of the course are:

- To recall digital transform techniques.
- To introduce architectural features of programmable DSP Processors.
- To develop the knowledge using Instruction set of DSP Processors.
- To understand Analog Devices.
- To understand interfacing techniques to memory and I/O devices.

Unit I

Introduction to Digital Signal Processing: Introduction, A Digital signal- processing system, The sampling process, Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Computational Accuracy in DSP Implementations: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion errors.

Unit II

Architectures for Programmable Digital Signal Processors: Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Features for External interfacing.

Unit III

Programmable Digital Signal Processors: Introduction, Commercial Digital signal processing Devices, Basic Architecture of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX processors, Pipeline Operation of TMS320C54XX Processor.

Unit IV

Analog Devices Family of DSP Devices: Analog Devices Family of DSP Devices -ALU and MAC block diagram, Shifter Instruction, Base Architecture of ADSP 2100, ADSP-2181 High Performance Processor.

Unit V

Interfacing Memory and Parallel I/O Peripherals to DSP Devices: Introduction, Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O interface, Interrupts I/O, Direct memory access (DMA).

Text Books

1. Digital Signal Processing — Avtar Singh and S. Srinivasan, Thomson Publications, 2004.
2. A Practical Approach To Digital Signal Processing – K Padmanabhan, R Vijayarajeswaran, Ananthi.S, New Age International, 2006/2009.

Reference Books

1. Digital Signal Processors, Architecture, Programming and Applications — B. Venkataramani and M.Bhaskar, 2002, TMH.
2. Digital Signal Processing — Jonatham Stein, 2005, John Wiley.
3. DSP Processor Fundamentals, Architectures & Features — Lapsleyet al. 2000, S. Chand & Co.

Course Outcomes

After completion of this course students will be able to

CO1: Understand the DFT, FFT, DSP system and Explain the DSP computational building blocks and addressing capabilities.

CO2: Distinguish between the architectural features of General purpose processors and DSP processors.

CO3: Discuss and understand the TMS320C54xx Processor.

CO4: Understand the Analog devices family of DSP devices .

CO5: Analyze the interface of various devices to DSP Processors.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

FPGA ARCHITECTURE & APPLICATIONS
(Professional Elective-VI)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None

Course Objectives:

- To introduce to the students the fundamentals of PLD's
- To study the architecture of various FPGA
- To understand PLD's & FPGAs use depending on application

Unit I

IntroductiontoProgrammableLogicDevices: Introduction,SimpleProgrammableLogicDevices – Read Only Memories, Programmable Logic Arrays, Programmable Array Logic, Programmable Logic Devices/Generic Array Logic; Complex Programmable Logic Devices – Architecture of Xilinx Cool Runner XCR3064XLCPLD,CPLD Implementation of a Parallel Adder with Accumulation

Unit II

Field Programmable Gate Arrays: Organization of FPGAs, FPGA Programming Technologies, Programmable Logic Block Architectures, Programmable Interconnects, and Programmable I/O blocks in FPGAs, Dedicated Specialized Components of FPGAs, Applications of FPGAs, Implementation Process, Introduction to Programing Technologies

Unit III

Commercially Available FPGA's-I:

SRAM Programmable FPGAs: Xilinx FPGAs: XC2000,XC 3000 and XC4000Architectures, Xilinx Design flow

Anti-Fuse Programmed FPGAs: ActelACT1, ACT2 and ACT3 Architectures

Unit IV

Commercially Available FPGA's-II:

Introduction to EPROM programmable Altera FPGAs: general architecture, Logic Array Block, Macrocell, Introduction to Plessey FPGA, Introduction to Plus Logic FPGA

Unit V

Design Applications: General Design Issues, Counter Examples, A Fast Video Controller, A Position Tracker for a Robot Manipulator, A Fast DMA Controller, Designing Counters with ACT devices, Designing Adders and Accumulators with the ACT Architecture

Textbooks:

1. FieldProgrammableGateArrayTechnology-StephenM.Trimberger,SpringerInternationalEdition.
2. DigitalSystemsDesign-CharlesH.RothJr,LizyKurianJohn,CengageLearning

Reference books:

1. FieldProgrammableGateArrays-JohnV.Oldfield,RichardC.Dorf,WileyIndia.
2. Digital Design Using Field Programmable Gate Arrays- PakK. Chan/Samiha Mourad, Pearson Low Price Edition.
3. Digital Systems Design with FPGA sand CPLDs-Ian Grout, Elsevier, Newnes.
4. FPGAbasedSystemDesign-WayneWolf,PrenticeHallModernSemiconductorDesignSeries.

Course Outcomes

At the end of course the students will be able to:

CO1: Understand PLDs & its use depending on application or design

CO2: Understand FPGAs & its use depending on application

CO3: Develop the understanding to analyzes RAM programmable Xilinx & Anti-Fuse Programmable Actel FPGAs architectures for applications

CO4: Develop the understanding to analyze PROM programmable Altera FPGAs& other commercially available FPGAs architectures for applications

CO5: Apply the knowledge of FPGAs for various design applications

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTERNET OF THINGS
(Professional Elective-VI)

B. TECH – VII Semester **L/T/P/C**
3/0 /0 /3

Pre Requisites: None

Course Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web based services on IoT devices

Unit I

Introduction to Internet of Things –Definition and Characteristics of IoT , Physical Design of IoT – IoT Protocols, IoT communication models, IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

Unit II

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT, Basics of IoT System Management with NETCOZF, YANG- ETCONF.

Unit III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes.

Unit IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

Unit V

IoT Physical Servers and Cloud of ferings – Introduction to Cloud Storage models and communication APIs Web server – Web server for IoT, Cloud for IoT.

Text Book

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti,Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
4. Learning Python, Mark Lutz, Orielly.

Reference Book:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.

Course Outcome

CO1: Interpret the vision of IOT from a global context.
CO2: Perceive building blocks of Internet of Things and its characteristics.
CO3: Learn the basic concepts of Python.
CO4: Implement the python programming using Raspberry.
CO5: Develop Python web applications and cloud servers for IOT.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(Open Elective-II)

B. TECH – VIII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None
Course Objectives:

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(Open Elective-III)

B. TECH – VIII Semester **L/T/P/C**
3/0 /0 /3

Pre-requisites: None
Course Objectives:

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

TECHNICAL SEMINAR

B. TECH – VIII Semester **L/T/P/C**
0/0 /2 /1

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROJECT PHASE – II

B. TECH – VII Semester **L/T/P/C**
0/0 /16/8

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DISASTER PREPAREDNESS & PLANNING MANAGEMENT
(OPEN ELECTIVE – CIVIL ENGINEERING)

B.Tech –EEE, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-Requisites–No prerequisites are needed for enrolling into the course

Course Objectives:
- To Know about the state of art of disaster management in world
- To Study the various natural disasters and its mitigation measures
- To understand human induced Hazards and its case studies
- To impart knowledge on remote sensing and GIS
- To expose students to various technologies used for disaster mitigation and management.

UNIT – I : Introduction
Hazard, vulnerability and risk, Types of disasters, Disaster management cycle, role of civil engineers in disaster management, Progress of disaster management in world, vulnerability profile of India, Disaster management act, Disaster management in India

UNIT – II : Natural Disasters
Hydro - meteorological based disasters –Tropical cyclones, floods, drought and desertification zones, Geographical based disasters – Earthquake, Tsunamis, Landslides and avalanches – Causes, Types, effects and Mitigation measures, coastal zone management

UNIT – III : Human induced hazards
Human induced hazards: chemical industrial hazards, major power breakdowns, traffic accidents, etc. Case studies

UNIT - IV: Remote sensing and GIS for Disaster Management
Introduction to remote sensing and GIS, its applications in disaster mitigation and management, case studies

UNIT - V: Disaster Management
Risk assessment and hazard mapping –mitigation and management options – warning and forecasting

Course Outcomes
On completion of the course, the students will be able to,
CO 1: Attain knowledge on various types, stages, phases in disaster management
CO 2: Recognize various types of natural disaster, Mitigation and Management Systems
CO 3: Know the different types of manmade disasters and its effects
CO 4: Explain Remote sensing technology and GIS in disaster mitigation and management.
CO 5: Know the concepts of risk, warning and forecasting methods in disaster management

TEXT BOOKS:
1. Pradeep Sahni, “Disaster Risk Reduction in South Asia”, Prentice Hall, First Edition, 2003
2. Singh B.K., “Handbook of Disaster Management: Techniques & Guidelines”, Rajat Publication, 2008
3. Ghosh G.K., “Disaster Management”, APH Publishing Corporation, First Edition, 2011

REFERENCE BOOKS:

1. Rajib, S and Krishna Murthy, R.R. "Disaster Management Global Challenges andLocal Solutions", Universities Press, First Edition, 2012
2. Navele, P & Raja, C.K., "Earth and Atmospheric Disasters Management, Natural and Manmade", B.S. Publications, First Edition, 2019
3. Tushar Battacharya., "Disaster Science and Management", Tata McGraw Hill Company, 2012

Online Resources:

1. https://nptel.ac.in/courses/105/104/105104183/
2. https://nptel.ac.in/courses/124/107/124107010/

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENVIRONMENTAL MANAGEMENT
(OPEN ELECTIVE – CIVIL ENGINEERING)

B.Tech –EEE, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre Requisites –No prerequisites are needed for enrolling into the course

Course Objectives:
- To introduce the environmental management policies and legal aspects in India
- To study the various steps involved in Environment management system standard
- To understand the importance of Environmental Impact Assessment
- To know about the environment management plan
- To know about the Environmental management techniques and control measure

UNIT – I : Introduction to Environmental Management
Scope and nature of Environment Management - its need and brief discussion on the ethical, legal and financial reasons for Environment Management, the framework and approach to develop Environment management system, Policies and legal aspect in India

UNIT – II : Environment management system (EMS) standard
Guideline to implement effective Environment management system, core element of EMS, EMS standard: ISO 14000, its evolution, principle and specification, benefit of EMS. Planning and its implementation, Comparison of other standards with ISO 14000

UNIT – III : Environmental Impact Assessment
EIA definition, its need and principle, scoping, screening and the baseline condition, different methodologies, Impact identification and decision making, EIA case studies in India

UNIT - IV : Environment management plan
Planning and identification of baseline condition and impact, monitoring and evaluation of risk, mitigation plan, legislation and environmental audit, disaster management plan, Life cycle assessment and risk analysis

UNIT – V : Environmental management techniques and control measure
Environmental monitoring, modelling and risk assessment, Implementation of sustainable design, control measure for different environment pollution such as air pollution, water pollution, soil and noise pollution

Course Outcomes:
On completion of the course, the students will be able to,

CO1 : Comprehend the need for Environmental Management
CO2 : Identify the attributes of Environment Management system and standards
CO3 : Apply different methodologies for impact assessment
CO4 : To understand the various Environment management plan
CO5 : Identify the techniques and control measures for Environment management

TEXT BOOKS:
1. John Pallister ., **Environmental Management,** Oxford University Press,2nd Edition,2017
2. Ajith Sankar., **Environmental Management,** Oxford University Press, First Edition, 2015
3. Krishnamoorthy Bala., Environmental Management, PHI Learning,3rd Edition,2017

REFERENCE BOOKS:

1. V Murali Krishna, Valli Manickam., Environmental Management, ELSEVIER, 1st Edition, 2017
2. Jacob Thomas ., **Environmental Management,** Pearson Education India.1st Edition,2014
3. M.C. Dash., **Concepts of Environmental Management for Sustainable Development,** Dreamtech Press &**Wiley, First Edition, 2019**

Online Resources:

1. https://nptel.ac.in/courses/120/108/120108004/

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

URBAN PLANNING
(OPEN ELECTIVE – CIVIL ENGINEERING)

B.Tech –EEE, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre Requisites –No prerequisites are needed for enrolling into the course

Course Objectives:
- To introduce the history of town planning and its importance
- To study the various steps involved in urban planning and its methods
- To know the importance of housing development
- To understand the importance of public transport and non-motorized transport.
- To introduce the concept of smart cities in India

UNIT – I : Introduction
History of Town Planning - Definitions and Objectives of Planning - Examples of planned and unplanned cities - Retrofitting medieval towns and existing cities - Healthy city planning

UNIT – II : Basic Planning Methods
Base map preparation - survey techniques - Analytical methods - region classification -
Demographic methods - population forecasting - Introduction of Remote sensing, GIS and GPS in urban planning context - Regional planning

UNIT – III : Housing Development
Policies and schemes - Housing typologies - Housing for the poor and elderly - Housing finance options – under privileged population management - Planning and management of local streets, water supply and storm water drainage - municipal solid waste management systems - new possibilities for recycling.

UNIT – IV : Transport and Mobility
Costs of congestion - Public and Para-transit modes (taxis and autos) - Feeder systems for the use of public transport - non-motorized transport facilities - cycling and walking infrastructure – Integrated public transport

UNIT – V: Smart Cities
Smart city developments across the world - Specific priorities for Smart Cities in India – Leveraging recent technologies in enhancing urban living: internet of things (IoT) - Recreation - Renewable energy - green corridors, green space and green buildings - Safety and security of urban population.

Course Outcomes:
On completion of the course, the students will be able to,

CO1 : Describe the importance of proper urban planning for a healthy city
CO2 : Apply basic methods for urban planning
CO3 : Describe housing development schemes
CO4 : Design public transport and non-motorized transport facilities for a city
CO5 : Describe smart city developments in India and abroad and its various elements

TEXT BOOK:

1. Peter Hall, Mark Tewdwr-Jones, Urban and Regional Planning. Taylor & Francis, 6th Edition, 2019
2. Joy Sen., Sustainable Urban Planning. The Energy and Resources Institute, New Delhi, 2013 Edition, 2013
3. Rao M. P., Urban Planning Theory And Practice, CBS Publishers,Revised Edition, 2019

REFERENCE BOOKS:

1. Peter Hall, Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880, Wiley-Blackwell, 4th Edition, 2014
2. Randall Crane and Rachel Weber, The Oxford Handbook of Urban Planning. Oxford University Press, 2012
3. Amiya Kumar Das., Urban Planning in India, Rawat Pubns,First Edition 2007

Online Resources:

1. https://nptel.ac.in/courses/124/107/124107158/

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ELECTRICAL POWER UTILISATION AND SAFETY
(OPEN ELECTIVE – ELECTRICAL AND ELECTRONICS ENGINEERING)

B.Tech –CIVIL, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisites: None

Course Objectives:

- To provide information of importance various parameters in electrical system.
- To analyze and design illumination scheme, electrification, earthing system and protection system for anapplication.

Unit-I:

Electric Heating and Welding Advantages of electric heating, resistance heating, types of furnaces, induction heating, types of induction furnaces, dielectric heating, types of welding- arc and resistance

Unit-II:

IlluminationScheme Basic terms used in illumination scheme, Electric lamps, Recommended levels of illumination, types of lighting schemes, design of lighting schemes, factory lighting, street lighting, flood lighting

Unit-III:

Electrical Installation, Estimating andCosting Types of loads, Load assessment, Electrical supply systems, wiring systems, Permissible voltage drops and conductor size calculations, Estimating and costing for residential and commercial service connections (single phase and three phase)

Unit-IV:

Power Factor Effects of power factor, causes of low power factor, disadvantages of low power factor, methods of improving power factor, most economical power factor.

Unit-V:

Electrical Safety, Earthing System and Protective Devices Electrical shock mechanisms, factors influencing the electric shock, body current thresholds (tolerable body current limit), thevenin's concepts and accidental equivalent circuits (step and touch potentials), protection against electric shock, purpose of earthing, IS rules for earthing of electrical installations, factors governing the resistance of earth electrode, methods of earthing, measurement of earth resistance, methods of reducing earth resistance, fuse, miniature circuit breakers (MCB) and earth leakage circuit breakers (ELCB).

Text Books:

1. E. Openshaw Taylor, Utilisation of Electrical Energy, Universities Press.
2. H. Partab, Art and Science of Utilisation of Electrical Energy, Dhanpat Rai & Co.
3. J. B. Gupta, Utilization of Electric Power and Electric Traction, S. K. Kataria & Sons, New Delhi.
4. G. C. Garg, Utilization of Electric Power and Electric Traction, Khanna Publishers, Delhi.
5. R. K. Rajput, Utilisation of Electrical Power, Laxmi Publications (P) Ltd., New Delhi.

References:

1. N. V. Suyranarayana, Utilisation of Electric Power Including Electric Drives and Electric Traction,NewAge Publishers, New Delhi.
2. J. B. Gupta, A Course in Electrical Installation Estimating and Costing, S. K. Kataria & Sons, NewDelhi.
3. Dr. J. G. Jamnani, Elements of Electrical Design, Mahajan Publishing House

Course outcomes:

On successful completion of this course, students are able to:

CO1: Know about the electric heating and welding

CO2: Gain the knowledge on illumination system.

CO3: Understand the electrical installation, estimation and costing.

CO4: Understand the importance of power factor.

CO5: Gain the knowledge on safety and protection.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CONCEPTS OF CONTROL SYSTEMS
(OPEN ELECTIVE – ELECTRICAL AND ELECTRONICS ENGINEERING)

B.Tech –CIVIL, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisites: None

Course Objectives:

- To understand the different ways of system representations such as Transfer functionrepresentation and state space representations and to assess the system dynamic response.
- To assess the system performance using time domain analysis and methods for improving it.

Unit-I:

Basic concepts of control system: Terminology - plant, process, system, disturbances, controlled variable, manipulated variable etc., Block diagram of basic control system, application areas with examples. Classifications of control systems, Concept of superposition for linear systems with examples.

Unit-II:

Mathematical modelling of systems: Translational and rotational mechanical systems, electrical systems, Force voltage and force current analogy, Position servo mechanism. Block diagram and signal flow graph representation of physical systems along with rules, properties, comparison and limitation, Mason's gain formula.

Unit-III:

Time response analysis: Standard test signals along with examples of their usage, steady state errors for step, ramp and parabolic inputs, analysis of first and second order systems, Transient response specifications with numerical examples, Basic control actions and two position, proportional, PI, PID and rate feedback controllers, Limitations of time domain analysis.

Unit-IV:

Frequency response analysis: Need of frequency response analysis, Sinusoidal response of linear system, methods used in frequency response, Frequency domain specifications.

Unit-V:

Stability: Concept of stability, types of stability, Routh's stability criterion, special cases with numerical examples, stability of closed loop system, concept of root locus, open loop and closed loop transfer poles, step by step procedure for root loci, numerical examples.

Text Books:

1. Katsuhiko Ogata, Modern control theory, Pearson Education International, Fifth edition.
2. Norman S Nise, Control system engineering, John Wiley & Sons, Inc., Sixth edition
3. Richard C. Dorf, Robert H Bishop, Modern control systems, Pearson Education International,Twelfth edition.

References:
1. Farid Golnaraghi, Benjamin C Kuo, Automatic control systems, John Wiley & Sons, Inc.,Nineth edition
2. J.Nagrath and M.Gopal,Control System Engineering, New Age International Publishers,5th Edition, 2007

Course Outcomes:
On successful completion of this course, students are able to:
CO1: Understand the basic concept control systems.
CO2: Know the mathematical model of the systems.
CO3: Estimate the time domain specifications and steady state error.
CO4: Know the frequency response analysis.
CO5: Understand concept of stability.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

RENEWABLE ENERGY SOURCES
(OPEN ELECTIVE – ELECTRICAL AND ELECTRONICS ENGINEERING)

B.Tech –CIVIL, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisites: None

Course Objectives:

- To introduce to the technology of renewable sources of energy.
- To learn about the solar radiation, its applications and radiation measuring instruments.
- To study the Geothermal biomass energy resources, biomass systems.
- To learn the methods of energy extraction from the wind and oceans.

Unit-I:

Global and National Energy Scenario: Over view of conventional & renewable energy sources, need, potential &development of renewable energy sources, types of renewable energy systems, Future of Energy Use, Global and Indian Energy scenario, Energy for sustainable development, renewable electricity and key elements, Global climate change, CO2 reduction potential of renewable energy- concept of Hybrid systems

Unit–II:

Solar Energy: Solar energy system, Solar Radiation, Availability, Measurement and Estimation, Solar Thermal Conversion Devices and Storage, Solar-Electrical Power Generation, general Solar Photo Voltaic (SVP) system, Different configurations, SPV system components and their characteristics, Stand-Alone and Grid Connected SPV systems, other Miscellaneous Applications of Solar Energy.

Unit–III:

Wind Energy: Wind Energy Conversion, Potential, Nature of the wind, Wind Data and Energy Estimation, Site selection, Types of wind turbines, Wind farms, Wind Generation and Control., classification of wind, characteristics, offshore wind energy – Hybrid systems, wind energy potential and installation in India

Unit -IV:

Hydel and Tidal Power Systems: Basic working principle, Classification of hydel systems: Large, small, micro – measurement of head and flow – Energy equation – Types of turbines – Numerical problems. Tidal power – Basics – Kinetic energy equation – Numerical problems – Wave power – Basics – Kinetic energy equation.

Unit- V:

Bio-Mass, Geothermal& Ocean Energy: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I. C. Engine operation and economic aspects. Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India. Ocean Energy: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles.

Text Books:

1. Godfrey Boyle, Renewable Energy,Oxford university, press, 3rd edition, 2013.

2. Ahmed and Zobaa, Ramesh C Bansal, Handbook of renewable technology World scientific, Singapore.
3. Ramesh & Kumar, Renewable Energy Technologies, Narosa.
4. Chetong Singh Solanki, Renewable energy technologies – A practical guide for beginners –, PHI.

References:

1. B.H. Khan, Non-conventional energy source TMH-2nd edition.
2. Karlsson, Kenneth Bernard; Skytte, Klaus Morthorst, Integrated energy systems modeling, DTU International Energy Report 2015.

Course outcomes:

On successful completion of this course, students are able to:
CO1: Know about the global and national energy scenario.
CO2: Understand the concept of solar energy.
CO3: Know the basics of wind energy.
CO4: Differentiate the hydel and tidal power plants.
CO5: Explore the bio-mass, geothermal and ocean energy.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

NON-CONVENTIONAL ENERGY SOURCES
(OPEN ELECTIVE – MECHANICAL ENGINEERING)

B.Tech –CIVIL, EEE, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisite – Nil

COURSE OBJECTIVES:

- Introduce to the technology of renewable sources of energy
- Learn about the solar radiation, its applications and radiation measuring instruments
- Learn about the various types of geothermal resources and its applications
- Study the biomass energy resources, bio-mass systems.
- Learn the methods of energy extraction from the wind and oceans learn to the technology of direct energy conversion methods

UNIT – I

PRINCIPLES OF SOLAR RADIATION:

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data.

UNIT – II

SOLAR ENERGY COLLECTION:

Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

SOLAR ENERGY STORAGE AND APPLICATIONS:

Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

UNIT – III

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria.

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Biogas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C. Engine operation and economic aspects.

UNIT – IV

GEOTHERMAL ENERGY: Resources, types of wells, methods of harnessing the energy, Potential in India.

OCEAN ENERGY: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT – V

DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, limitations and principles of DEC. Thermoelectric generators, see beck, pettier and joule Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

COURSE OUTCOMES:

The students will be able to

CO1 Apply the technology to capture the energy from the renewable sources like sun, Wind,ocean, biomass, geothermal.

CO2 Use different renewable energy sources to produce electrical power minimize the use ofconventional energy sources to produce electrical energy

CO3 Identify the fact that the conventional energy resources are depleted

CO4 Understand direct energy conversion

CO5 Learn different methods in solar energy system.

TEXTBOOKS:

1. Non-Conventional Energy Sources /G.D. Rai
2. Renewable Energy Technologies /Ramesh & Kumar /Narosa

REFERENCE BOOKS:

1. Renewable energy resources/ Tiwari and Ghosal/ Narosa.
2. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
3. Non-Conventional Energy Systems / K Mittal /Wheeler
4. Solar Energy /Sukhame

ONLINE RESOURCES:

1. NPTEL Course: Non-Conventional Energy Resources by Dr. Prathap Haridoss, IIT Madras.

Link: https://nptel.ac.in/courses/121/106/121106014/

2. NPTEL Course: Non-Conventional Energy Systems by Prof. L. Umanand, IISc Bangalore.

Link: https://nptel.ac.in/courses/108/108/108108078/

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ROBOTICS
(OPEN ELECTIVE – MECHANICAL ENGINEERING)

B.Tech –CIVIL, EEE, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisite – Nil

COURSE OBJECTIVES:

- Students will be able to understand the concepts of robotics – classification by coordinate system and control system.
- Students will be able to determine the degrees of freedom, end effectors, electric hydraulic and pneumatic devices.
- Students will possess the concepts of homogeneous transformations.
- Student will understand the Jacobean problems, Newton – Euler transmations.
- Students will know about the actuators and feedback components, resolvers, encoders - velocity sensors.
- Students will be able to know the applications of robots in manufacturing.

UNIT – I

INTRODUCTION

Automation and Robotics – An over view of Robotics – classification by coordinate system and control systems – Components of Industrial Robotics: Degrees of freedom – End effectors: Types of grippers: Mechanical, Magnetic, Vacuum cup – General considerations on gripper selection and design.

UNIT – II

MOTION ANALYSIS

Basic rotation matrices – Composite rotation matrices – Euler Angles – Equivalent Angle and Axis – Homogeneous transformation – Problems.

Manipulator Kinematics: D.H.Notation– Joint coordinates and world coordinates – Forward and inverse kinematics – problems.

Differential Kinematics: Differential kinematics of planar and spherical manipulators – Jacobians – Problems.

UNIT – III

ROBOT DYNAMICS

Lagrange – Euler formulations – Newton – Euler formulations – Problems on planar two link manipulators.

UNIT – IV

TRAJECTORY PLANNING

Joint space scheme – cubic polynomial fit – Avoidance of obstacles – Types of motion – Slew motion – Joint interpolated motion – straight line motion – problems.

UNIT – V

ROBOT ACTUATORS AND FED BACK COMPONENTS

Actuators: Pneumatic and Hydraulic actuators. Electric Actuators: DC servo motors – stepper motors. Feedback components: position sensors – potentiometers, resolvers and encoders – Velocity sensors – Tactile sensors.

Robot Application in Manufacturing: Material handling – Assembly and Inspection.

COURSE OUTCOMES:

The students will be able to

CO1 Apply the knowledge of robotics in real time human life applications.
CO2 Analyse the concept of CAD/CAM and automation to the robotics.
CO3 Compare knowledge of robot applications in manufacturing like, material handling, loading and unloading etc.
CO4 Experiment the robotics to the spot and continuous arc welding and spray painting.
CO5 Relate the Robot Application in Manufacturing.

TEXTBOOKS:

1. Groover M P, "Industrial Robotics", Pearson Edu., 2012 1st Edition, ISBN Number: 0070265097, 9780070265097, 978-0070265097.
2. JJ Craig, "Introduction to Robotic Mechanics and Control", Pearson, 2008 3rd edition. ISBN-13: 978-0201543612

REFERENCE BOOKS:

1. Fu K S, "Robotics", McGraw Hill, 1st Ed., 2008, ISBN 13: 9780070226258.
2. Richard D.Klafter, "Robotic Engineering", Prentice Hall, 1st Ed., 1989, ISBN-13: 9780137820535.

ONLINE RESOURCES:

1. NPTEL Course: Introduction to Robotics by Dr. Balaraman Ravindran, IIT Madras. Link: https://nptel.ac.in/courses/107/106/107106090/
2. NPTEL Course: Introduction to Robotics by Prof. Ashish Dutta, IIT Kanpur. Link: https://nptel.ac.in/courses/112/104/112104298/
3. http://www.robogrok.com/index.html

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MECHATRONICS
(OPEN ELECTIVE – MECHANICAL ENGINEERING)

B.Tech –CIVIL, EEE, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisite – Nil

COURSE OBJECTIVES:

- Know the basic concepts of mechatronics.
- Know the various actuating systems like Hydraulic, pneumatic, mechanical and electrical actuating system.
- Know about the micro processor and micro controllers.
- Know about the system and interfacing and data acquisition.

UNIT – I

Mechatronics systems, elements, levels of mechatronics system, Mechatronics design system, measurement systems, control systems, microprocessor-based controllers, advantages and displacement, position, proximity, velocity, motion, force, acceleration, torque, fluid pressure, liquid flow, liquid level, temperature and light sensors.

UNIT – II

Solid state electronic devices, PN Junction diode, BJT, FET, DIA and TRIAC. Analog signal conditioning, amplifiers, filtering. Introduction to MEMS & typical applications.

UNIT – III

Hydraulic and pneumatic actuating systems, Fluid systems, Hydraulic and pneumatic systems, components, control valves, electro-pneumatic, hydro-pneumatic, electro-hydraulic servo systems: Mechanical actuating systems and electrical actuating systems.

UNIT – IV

Digital electronics and systems, digital logic control, micro processors and micro controllers, programming, process controllers, programmable logic controllers, PLCs versus computers, application of PLCs for control.

UNIT – V

System and interfacing and data acquisition , DAQS, SCADA, A to D and D to A conversions; Dynamic models and analogies, System response . Design of mechatronics systems & future trends.

COURSE OUTCOMES:

The students will be able to

CO1 Use the control system, mechatronics design systems and measurement systems.
CO2 Work on various actuating systems.
CO3 Convert the signals from one form to another form.
CO4 Estimate the micro controllers and micro processors.
CO5 Develop the simple programming code for PLC's.

TEXTBOOKS:

1. Mechatronics Integrated Mechanical Electronics Systems/KP Ramachandran &GKVijaya Raghavan/WILEY india Edition/2008
2. Mechatronics Electronics control systems in Mechanical andElectrical Engineering/W Bolton/Pearson Education press/3rd edition,2005.

REFERENCE BOOKS:

1. Mechatronics Source books by Newton C Braga, Thomson Publications, Chennai.
2. Mechatronics – N.Shanmugam/ Anuradha Agencies Publishers.
3. Mechatronics System Design/Devdas shetty/Richard/Thomson.

ONLINE RESOURCES:

1. NPTEL Course: Mechatronics by Prof. Pushparaj Mani Pathak, IIT Roorkee.Link: https://nptel.ac.in/courses/112/107/112107298/
2. NPTEL Course: Mechatronics and Manufacturing Automation by Dr. Shrikrishna N.Joshi, IIT Guwahati.

Link: https://nptel.ac.in/courses/112/103/112103174/

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DIGITAL IMAGE PROCESSING
(OPEN ELECTIVE – ELECTRONICS & COMMUNICATION ENGINEERING)

B.Tech –CIVIL, EEE, MECH, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre Requisites: None

Course Objectives

- To familiarize the students with digital image fundamentals.
- To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
- To learn concepts of degradation function and restoration techniques.
- To study the image segmentation and representation techniques.
- To Understand the concepts of image compression techniques.

UNIT- I

Digital Image Fundamentals & Image Transforms: Digital Image Fundamentals, Sampling and Quantization, Relationship between Pixels,

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

UNIT -II

Image Enhancement (Spatial Domain): Introduction, Image Enhancement in Spatial Domain: Enhancement through Point Operation, Types of Point Operation, Histogram Manipulation, Linear and Non — Linear Gray Level Transformation, Spatial domain filtering.

Image Enhancement (Frequency Domain): Low Pass (Smoothing) filters, High Pass (Sharpening) filters and Homomorphism filtering.

UNIT -III

Image Restoration: Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-IV

Image Segmentation: Detection of Discontinuities, Edge Linking And Boundary Detection, Thresholding, Region based Segmentation.

Morphological Image Processing: Dilation and Erosion operations, Opening and Closing operations, Hit or Miss Transformation.

UNIT-V

Image Compression: Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

Text Books

3. Digital Image Processing – Rafael C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008
4. Fundamentals of Digital Image Processing — A.K.Jain, PHI, 1989

Reference Books

1. Digital Image Processing using MATLAB — Rafael C. Gonzalez, Richard E Woods and Steven L.Eddings, 2nd Edition, TMH, 2010.
2. Digital Image Processing- S Jayaraman, S Esakkirajan, T Veerakumar- TMH, 2010.

3. Digital Image Processing with MATLAB & Labview — Vipula Singh, Elsevier.

Course Outcomes

After completion of this course students will be able to

CO1 Gain the knowledge of digital image fundamentals and image transforms.
CO2 Understand image enhancement in spatial and frequency domain.
CO3 Understand the different methods to restore an image.
CO4 Analyze image segmentation techniques and morphological image processing.
CO5 Analyze the different image compression techniques.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

WIRELESS AND MOBILE COMMUNICATION
(OPEN ELECTIVE – ELECTRONICS & COMMUNICATION ENGINEERING)

B.Tech –CIVIL, EEE, MECH, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre Requisites: None

Course Objectives

- To provide the student with an understanding of the Cellular concept, Frequency reuse, Hand-off strategies.
- To enable the student to analyze and understand wireless and mobile cellular communication systems over a stochastic fading channel
- ToprovidethestudentwithanunderstandingofCo-channelandNon-Co-channelinterference
- To give the student an understanding of cell coverage for signal and traffic, diversity techniques and mobile antennas.
- To give the student an understanding of frequency management, Channel assignment and types of hand off.

UNIT - I

Introduction to Cellular Mobile Radio Systems: Limitations of Conventional Mobile Telephone Systems, Basic Cellular Mobile System, First, Second, Third and Fourth Generation Cellular Wireless Systems, Uniqueness of Mobile Radio Environment- Fading, Coherence Bandwidth, Delay Spread, Doppler Spread and Coherence Time. Fundamentals of Cellular Radio System Design: Concept of Frequency Reuse, Co-Channel Interference, Co-Channel Interference Reduction Factor, Desired C/I From a Normal Case in a Omni Directional Antenna System, Trunking and Grade of Service, ImprovingCoverageandCapacityinCellularSystems-CellSplitting,Sectoring,MicrocellZoneConcept.

UNIT - II

Co-Channel Interference: Measurement Of Real Time Co-Channel Interference, Design of Antenna System, Diversity Techniques-Space Diversity, Polarization Diversity, Frequency Diversity, Time Diversity, Directional Diversity. Non-Co-Channel Interference: Adjacent Channel Interference, Near End Far End Interference, Cross Talk, Effects on Coverage and Interference by Power Decrease, Antenna Height Decrease, Effects of Cell Site Components.

UNIT - III

Cell Coverage for Signal and Traffic: Signal Reflections in Flat and Hilly Terrain, Effect of Human Made Structures, Phase Difference Between Direct and Reflected Paths, Constant Standard Deviation, Straight Line Path Loss Slope, General Formula for Mobile Propagation Over water and Flat Open Area, Near and Long Distance Propagation, Path Loss From a Point to Point Prediction Model in Different Conditions, Merits of Lee Model. Cell Site and Mobile Antennas: Space Diversity Antennas, Umbrella Pattern Antennas.

UNIT - IV

Frequency Management and Channel Assignment: Numbering and Grouping, Access and Paging Channels, Channel Assignments to Cell Sites and Mobile Units, Channel Sharing and Borrowing, Sectorization, Overlaid Cells, Non Fixed Channel Assignment.

UNIT - V

Handoffs and Dropped Calls: Handoff Initiation, Types of Handoff, Delaying Handoff, Advantages of

Handoff, Power Difference Handoff, Forced Handoff, Mobile Assisted and Soft Handoff, inter system Handoff, Introduction to Dropped Call Rates and their Evaluation.

Text Books

4. MobileCellularTelecommunications—W.C.Y.Lee,McGrawHill,2ndEdn.,1989.
5. Wireless Communications – Theodore. S. Rapport, Pearson Education, 2nd Edn.,2002.
6. Mobile Cellular Communication – Gottapu sashibhushana Rao, Pearson,2012.

Reference Books

6. PrinciplesofMobileCommunications—GordonL.Stuber,SpringerInternational,2ndEdn.,2001.
7. Modern Wireless Communications-Simon Haykin, Michael Moher,Pearson Education,2005.
8. Wireless Communications Theory and Techniques, Asrar U. H .Sheikh,Springer, 2004.
9. Wireless Communications and Networking, Vijay Garg, Elsevier Publications,2007.
10. Wireless Communications —Andrea Goldsmith, Cambridge University Press,2005.

Course Outcomes

By the end of the course, the student will be able to

CO1 Estimate the impairments due to multi path fading channel.
CO2 Explain an Importance of the fundamental techniques to overcome the different fading effects.
CO3 Distinguish the co-channel and Non co-channel interference.
CO4 Inspect cell coverage for signal and traffic, diversity techniques and mobile antennas.
CO5 Relate and explain the functioning of frequency management, Channel assignment and types of handoff.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

SENSOR NETWORKS
(OPEN ELECTIVE – ELECTRONICS & COMMUNICATION ENGINEERING)

B.Tech –CIVIL, EEE, MECH, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: None

Course Objectives:

- To introduce the various types of sensor & networks in wireless
- To explore the analysis of various sensors & networks

UNIT-I

OVERVIEWOFWIRELESSSENSORNETWORKS: ChallengesforWirelessSensorNetworks,EnablingTechnologiesForWireless Sensor Networks.

UNIT-II

ARCHITECTURES: Single-NodeArchitecture-HardwareComponents,EnergyConsumption of Sensor Nodes , Operating Systems and Execution Environments, Network Architecture - Sensor Network Scenarios, Gateway Concepts.

UNIT-III

NETWORKING SENSORS: Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts -S-MAC , The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses.

UNIT-IV

INFRASTRUCTURE ESTABLISHMENT: Topology Control , Clustering, Time Synchronization, Localization and Positioning**.**

UNIT-V

SENSOR NETWORK PLATFORMS AND TOOLS: Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-levels of twareplatforms, Node-level Simulators**.**

TEXTBOOKS

3. HolgerKarl&AndreasWillig,"ProtocolsAndArchitecturesforWirelessSensorNetworks", John Wiley,2005.
4. Feng Zhao &Leonidas J. Guibas, ‐Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.

REFERENCES

3. Kazem Sohraby, Daniel Minoli, &Taieb Znati, ‐Wireless Sensor Networks- Technology, Protocols, And Applications‖,JohnWiley, 2007.
4. AnnaHac, ‐Wireless Sensor Network Designs‖, John Wiley, 2003.

Course Outcomes

At the end of the course, the student will be able to

CO1 Understand the overview of sensor &networks.

CO2 Explore the various architectures of sensors & network

CO3 Uunderstand the various protocols in sensor networks.

CO4 Identify the infrastructure and establishment of sensor networks.
CO5 Explore various sensor network platforms and tools.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

BIOMEDICAL INSTRUMENTATION
(OPEN ELECTIVE – ELECTRONICS & COMMUNICATION ENGINEERING)

B.Tech –CIVIL, EEE, MECH, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre Requisites: None

Course Objectives

The following are the course objectives

- To study bioamplifier, biosignals and measurement of physiological parameters.
- To know about different bioelectrodes and activities of heart.
- To understand therapeutic and cardic instrumentation.
- To study EEG and EMG machines, recordings and interpretations.

UNIT-I

Components of Medical Instrumentation System: Bloamplifier, Static and Dynamic Characteristics of Medical Instruments, Biosignals and Characteristics, Problems encountered with Measurements from Human beings. Organization of Cell, Derivation of Nernst equation for Membrane Resting Potential Generation and Propagation of Action Potential, Conduction through Nerve to Neuromuscular Junction.

UNIT -II

Bio Electrodes: Biopotential Electrodes-External Electrodes, Internal Electrodes, Biochemical Electrodes. Mechanical Function, Electrical Conduction System of the Heart, Cardiac Cycle, Relation between Electrical and Mechanical Activities of the Heart.

UNIT -III

Cardiac Instrumentation: Blood Pressure and Blood Flow Measurement, Specification of ECG Machine, Einthoven Triangle, Standard 12-Lead Configurations, Interpretation of ECG waveform with respect to Electro Mechanical Activity of the Heart.

UNIT -IV

Therapeutic Equipment: Pacemaker, Defibrillator, Shortwave Diathermy, Hemodialysis Machine.
Respiratory Instrumentation: Mechanism of Respiration, Spirometry, Pnemuotachograph Ventilators.

UNIT -V

Neuro-Muscular Instrumentation: Specification of EEG and EMG Machines, Electrode Placement for EEG and EMG Recording, Interpretation of EEG and EMG.

Text Books

1. Biomedical Instrumentation and Measurements — by Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, PHI.
2. Medical Instrumentation, Application and Design — by John G.Webster, John Wiley.

Reference Books

1. Principles of Applied Biomedical Instrumentation — by L.A. Geoddes and L.E. Baker, John Wiley and Sons.
2. Hand-book of Biomedical Instrumentation — by R.S. Khandpur, McGraw-Hill, 2003.

3. Biomedical Telemetry — by Mackay, Stuart R., John Wiley.

Course Outcomes

At the end of the course, the student will be able to

CO1 Understand the functions of bio amplifiers, characteristics of medical instruments and bio signals.

CO2 Discuss the various internal, external Bio electrodes and relations between electrical and mechanical activities of heart.

CO3 Compare various concepts of Cardiac Instrumentation and gain the knowledge about

CO4 Analyze the Therapeutic Equipment and their operation.

CO5 Acquires knowledge about neuro-muscular Instrumentation like ECG EMG and EEG.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DATABASE MANAGEMENT SYSTEMS
(OPEN ELECTIVE – COMPUTER SCIENCE & ENGINEERING)

B.Tech –CIVIL, EEE, MECH, ECE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: Data Structures, Mathematics-I

Course Objectives:

This Course provides an emphasis on how to organize, maintain and retrieve information efficiently and effectively from a Database and it presents an introduction to data base management systems (DBMS) and relational data model. Also the course introduces the concepts of transactions and transaction processing and the issues and techniques relating to concurrency and recovery in multi-user database environments. .

UNIT- I: Introduction

Database system Applications - Database System versus File Systems - View of Data– Instances and schema - Data Models - Database Languages -DDL-DML - Database Users and Administrator –Transaction Management - Database System Structure-Application Architectures – History of Database Systems.

UNIT- II: Database Design and ER model

Basic concepts - Entity sets and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram- Weak Entity Sets - Extended E-R Features - Designing of an E-R Database Schema-Reduction of an E-R Schema to Tables.

UNIT- III: Relational Model

Introduction to the Relational Model – Structure of Relational Databases - Relational Algebra –Relational Calculus – Domain relational Calculus, Tuple Relational Calculus - Integrity and Security –Domain Constraints, Referential Integrity Constraints-Triggers-security and Authorization – SQL- Basic Structure, Set operations, Aggregate Operations –Null values- Nested Sub queries – Views –Modification of Database-Joined relations, Case Statement, NVL Function, Conversion Functions.

UNIT- IV: Informal Design guidelines for Relation Schema

Functional Dependencies– Normal Forms based on Primary Keys-Decomposition–Desirable properties of Decomposition – First Normal Form, Second Normal Form–Third Normal Form- Boyce- Codd Normal Form - Multivalued Dependency- Fourth Normal Form- Fifth Normal Form-Transactions-Transaction Concept- Transaction state- Implementation of atomicity and Durability- Concurrent Executions – Serializability, Recoverability-Implementation of Isolation.

UNIT-V: Concurrency Control

Lock Based Protocols, Dead Lock Handling, Multiple Granularity, Time-stamp Based Protocols, Validation Based Protocols.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log Based recovery, Shadow Paging, Recovery with concurrent transactions.

Storage and File Structure - File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices, B+ Tree Index files, B- tree index files – Static Hashing – Dynamic Hashing – Comparison of Indexing and Hashing.

Course Outcomes:

After the completion of this course, the students should be able to

CO-1: Perceive the fundamental concepts of database management.

CO-2: Analyze database models & Entity Relationship models and to draw the E-R diagram for the given case study.
CO-3: Apply relational Database Theory, and be able to write relational algebra expressions for queries.
CO-4: Apply Normalization Process to construct the database and explain Basic Issues of Transaction processing.
CO-5: Compare the basic Database storage structures and access techniques: File Organization indexing methods including B- Tree and Hashing.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth , sixth Edition, McGraw hill.
2. Database Systems,Ramez Elmasri Shamkant B.Navathe Pearson Education,6th edition

REFERENCE BOOKS:

1. Database Management Systems, Raghu ramakrishnan, Johannes Gehrke, TATA Mc Graw Hill
2. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
3. Database Systems ,The Complete Book, Hector Garcia-Molina, Jeffrey D.Ullman, Jennifer Widom.
4. An Introduction to Database Systems, C.J. Date ,Eighth edition

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

JAVA PROGRAMMING
(OPEN ELECTIVE – COMPUTER SCIENCE & ENGINEERING)

B.Tech –CIVIL, EEE, MECH, ECE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-Requisites: Programming for Problem Solving

Course Objectives:

- This course introduces computer programming using the JAVA programming language with object-oriented programming principles.
- The use of Java in a variety of technologies and on different platforms.
- To understand fundamentals of object-oriented programming in Java which includes defining classes, invoking methods, using class libraries.
- Using API to solve real world problems.

UNIT-I

OOP Concepts: OOP Features, OOP Concepts-Data Abstraction, Encapsulation, Inheritance, Polymorphism, Classes and Objects, Procedural and Object Oriented Programming paradigms.

Java Programming: History of Java, Data Types, Variables, Constants, Scope and Life Time of Variable, Operators, Type Conversion and Casting, Conditional Statements, Iterative statements, Break and Continue statements, Access Controls, Arrays, Methods and Constructors, Static variables and Static methods, This reference, Overloading methods, Garbage collection, Nested Classes, and Inner Classes.

UNIT-II

Inheritance: Inheritance - types of Inheritance, Member access rules, Method Overriding, Super keyword, Preventing Inheritance: Final classes and methods.

Interfaces: Abstract class, defining an Interface, Abstract Vs Interface, implementing and extending Interface.

UNIT-III

Packages- Defining, creating and accessing a Package, and importing Packages.

Exception Handling- Exception Handling**,** Types of Exceptions. Usage of try, catch, throw, throws and finally, re-throwing exceptions, and User defined Exceptions.

UNIT-IV

Multi Threading- Creating Thread, Life cycle of Thread, Thread priorities, Synchronization of Threads, Inter-Thread Communication, and Producer Consumer Problem.

Collection Framework in Java- Overview of Java Collection Frame work, Generics, Commonly used Collection Classes and Interfaces-Array List, Vector, Hash Table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, Calendar, and Properties.

UNIT-V

GUI Programming with Java- AWT class Hierarchy, Introduction to Swing, Swing vs. AWT, Containers-JFrame, JApplet, and JPanel, Swing components- JButton, JLabel, JTextField, and JTextArea. Layout manager and its types.

Event Handling- Events, Event classes, Event Listeners, Delegation event model, Examples: handling a button click, and handling mouse and keyboard events.

Applet: Create an Applet, Life Cycle of an Applet, and passing parameters to Applet.

Course Outcomes:

CO-1: Understand the use of OOP concepts and solve real world problems using OOP techniques.
CO-2: Solve the inter-disciplinary applications using the concept of inheritance.
CO-3: Develop robust and faster applications by applying different exception handling mechanisms.
CO-4: Understand the multithreading concepts and develop efficient applications.
CO-5: Design GUI based applications and develops applets for web applications.

TEXT BOOK:

1. Java The Complete Reference, 8th Edition. herbert schildt. Indian edition.

REFERENCE BOOKS:

1. Java for Programmers, P.J. Dietel and H.M Dietel,Pearson Education (OR) JAVA: How to Program P.J. Dietel and H.M. Dietel, PHI.
2. Object Oriented Programming through Java, P. Radha Krishna, University Press.
3. Thinking in Java, Bruce Ecel, Pearson Education
4. Programming in Java, S. Malhotra and S. Choudary, Oxford Univ. Press.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO NETWORK SECURITY
(OPEN ELECTIVE – COMPUTER SCIENCE & ENGINEERING)

B.Tech –CIVIL, EEE, MECH, ECE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre requisites: Data Communications and Computer Networks.

Course Objectives:

- To explain the objectives of information security and importance and application of each of confidentiality, integrity, authentication and availability. Understand various cryptography concepts and techniques.
- To illustrate various symmetric key and asymmetric key cryptographic algorithms.
- To define the basic requirements of message authentication, hashing algorithms.
- To describe E-Mail Security with PGP, S/MIME.
- To discuss the requirements of SET, understand intrusion detection and Firewalls.

UNIT – I

Security Concepts: Introduction, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security, **Cryptography Concepts and Techniques:** Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, Steganography.

UNIT – II

Symmetric key Ciphers: Block Cipher principles, Feistel Cipher Structure, DES algorithm, AES algorithm, Multiple Encryption and Triple DES, Block cipher operation, Stream ciphers, RC4. **Asymmetric key Ciphers:** Principles of public key cryptosystems, RSA algorithm, Diffie- Hellman Key Exchange.

UNIT – III

Cryptographic Hash Functions: Message Authentication, Secure Hash Algorithm(SHA-512). **Message authentication codes:** Authentication requirements, HMAC, Digital signatures.

UNIT – IV

E-Mail Security: Pretty Good Privacy-Notations, PGP Operation-Authentication and Confidentiality, Cryptographic Keys and Key Rings, Message Transmission and Reception. **S/MIME**-S/MIME Functionality, Messages, Certificate Processing, Certification Authorities

UNIT – V

Web Security: Requirements, Secure Electronic Transaction (SET), Intruders, Firewall Design principles, Trusted Systems, Intrusion Detection Systems(Online Chapters and Appendices: Chapter 22,Chapter 23).

Course Outcomes:

After the completion of this course, the students should be able to

CO-1: Identifies various types of vulnerabilities, attacks, mechanisms and security services.
CO-2: Compare and contrast symmetric and asymmetric encryption algorithms.
CO-3: Implementation of message authentication, hashing algorithms.
CO-4: Explore E-Mail security, S/MIME Functionality.
CO-5: Develop intrusion detection system and designing of various types of firewalls.

TEXT BOOK:

1. Cryptography and Network Security - Principles and Practice: William Stallings,Pearson Education, 6th Edition

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security :Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO CLOUD COMPUTING
(OPEN ELECTIVE – COMPUTER SCIENCE & ENGINEERING)

B.Tech –CIVIL, EEE, MECH, ECE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisites:
1. A course on "Computer Networks"
2. A course on "Operating Systems"
3. A course on "Distributed Systems"

Course Objectives:
- This course provides an insight into cloud computing
- Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

UNIT-I
Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nano computing.

UNIT-II
Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing,Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

UNIT-III
Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud,Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managingthe Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

UNIT-IV
Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service, Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

UNIT-V
Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue ,service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjrasoft, Aneka Platform

Course Outcomes:
CO-1: Ability to understand various service delivery models of a cloud computing architecture.
CO-2: Ability to understand the ways in which the cloud can be programmed and deployed.
CO-3: Understanding Cloud Computing Architecture and Management
CO-4: Understanding cloud service Models.
CO-5: Understanding cloud service providers.

TEXT BOOK:

1. Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014

REFERENCE BOOKS:

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.
3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp 2011.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTERNET OF THINGS (IoT)
(OPEN ELECTIVE – COMPUTER SCIENCE & ENGINEERING)

B.Tech –CIVIL, EEE, MECH, ECE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: Basic Programming Knowledge, Communications Protocols

Course Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web based services on IoT devices

UNIT I

Introduction to Internet of Things –Definition and Characteristics of IoT , Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs, IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data Analytics, Communication Protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT II

IoT and M2M – Introduction to M2M, Difference between M2M and IoT, Software Defined Networks, Network Function Virtualization, differences between SDN and NFV for IoT, Basics of IoT System Management with SNMP, NETCONF, NETOPEER.

UNIT IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python programs with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from gpio pins.

UNIT V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Web servers – Web server for IoT, Cloud for IoT, Python web application framework, Designing a RESTful web API.

Course Outcomes:

After the completion of this course, the students should be able to

CO-1: Interpret the vision of IoT from global context.

CO-2: Perceive building blocks of Internet of Things and its characteristics.

CO-3: Learn the basic concepts of Python. Implement the python programming using Raspberry.

CO-4: Perceive the application areas of IoT. Realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks

CO-5: Determine the Market perspective of IoT. Develop Python web applications and cloud servers for IoT.

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547

2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

REFERENCE BOOK:

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DATA STRUCTURES AND ALGORITHMS
(OPEN ELECTIVE – COMPUTER SCIENCE & ENGINEERING)

B.Tech –CIVIL, EEE, MECH, ECE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisites: A course on "Programming for Problem Solving".

Course Objectives:

- Exploring basic data structures such as stack sand queues.
- Introduce a variety of data structures such as hash tables, search trees, heaps, graphs.

UNIT -I

Basic Concepts: Algorithm specification- Introduction , Performance analysis and Performance measurement. Arrays: The Abstract data type, Sparsematrices- Introduction, Sparse matrix representation, Transposing a matrix.

Stacks and Queues : StackAbstractDataType,Stackoperations,QueueAbstractDataType,Queue operations.Evaluationofexpressions-Expressions,Postfixnotations,Infixtopostfix.

UNIT -II

Linked Lists: Singly linked lists and chains, Representing chains, Linked stacks and Queues,Doubly linked lists, Circular lists.

Trees: Introduction, Binary trees- The abstract data type, Properties of binary trees, Binary tree representations, Binary tree traversals- Inorder traversal, Preorder traversal, Post order traversal.

Binary search trees: Definition, Searching a binary search tree, Insertion into a binary search tree, Deletion from a binary search tree, Joining and Splitting binary search trees, Height ofa binary search tree.

UNIT-III

Heaps: Priority Queues, Definition of MAX heap, insertion into a MAX Heaps, Deletion froma MAX Heaps.

Efficient Binary Search Trees: Optimal binary search trees, AVL trees, rotations of AVLtrees. Multiway Search Trees: M-way search trees, B-trees.

UNIT -IV

Hashing: Introduction, Hash functions, Collision resolution Techniques - Hash tableoverflow, Extendible hashing.

Graphs: The Graph Abstract Data Type- Introduction, Definition, Graph representations, Elementary graph operations-Depth first search, Breadth first search.

UNIT -V

Sorting-Types of sorting, Insertion sort, Selection sort, Quick sort, Merge sort, Heapsort, External sorting-K-way merge sort, Comparison of all sorting methods.

Course Outcomes:

CO-1: Define the basic techniques of algorithm analysis
CO-2: Examine the linear and non linear data structures.
CO-3: Develop Priority Queues and Balanced Trees.
CO-4: Understand Hashing Techniques and Graph applications.
CO-5: Apply suitable algorithms for sorting Technique.

TEXT BOOK:

1. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni andSusanAndersonFreed, Universities Press.

REFERENCE BOOKS:

1. Data Structures: A PseudocodeApproachwithC,2nd Edition, R.F. Gilberg and B.A.Forouz and Cengage Learning.
2. Data Structures using C–A.S.T anenbaum, Y.Langsam, and M.J. Augenstein, PHI/ Pearson Education.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ARTIFICIAL INTELLIGENCE
(OPEN ELECTIVE – CSM (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-Requisites: None

Course Objectives:

- To learn the difference between optimal reasoning vs human like reasoning
- To understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities
- To learn different knowledge representation techniques
- To understand the applications of AI: namely Game Playing.
- To understand Theorem Proving, Expert Systems.

UNIT - I

Introduction: AI problems, Agents and Environments, Structure of Agents, Problem Solving Agents Basic Search Strategies: Problem Spaces, Uninformed Search (Breadth-First, Depth-First Search, Depth-first with Iterative Deepening), Heuristic Search (Hill Climbing, Generic Best-First, A*), Constraint Satisfaction (Backtracking, Local Search)

UNIT - II

Advanced Search: Constructing Search Trees, Stochastic Search, A* Search Implementation, Minimax Search, Alpha-Beta Pruning Basic Knowledge Representation and Reasoning: Propositional Logic, First-Order Logic, Forward Chaining and Backward Chaining, Introduction to Probabilistic Reasoning, Bayes Theorem

UNIT - III

Advanced Knowledge Representation and Reasoning: Knowledge Representation Issues, Nonmonotonic Reasoning, Other Knowledge Representation Schemes Reasoning Under Uncertainty: Basic probability, Acting Under Uncertainty, Bayes' Rule, Representing Knowledge in an Uncertain Domain, Bayesian Networks

UNIT - IV

Learning: What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples, Winston's Learning Program, Decision Trees.

UNIT - V

Expert Systems: Representing and Using Domain Knowledge, Shell, Explanation, Knowledge Acquisition.

Course Outcomes:

CO-1: Possess the ability to formulate an efficient problem space for a problem expressed in English.
CO-2: Possess the ability to select a search algorithm for a problem.
CO-3: Possess the skill for representing knowledge using the appropriate technique
CO-4: Possess the ability to apply AI techniques to solve problems of Game Playing,
CO-5: Possess the Expert Systems, Machine Learning and Natural Language Processing

TEXT BOOK:

1. Russell, S. and Norvig, P, Artificial Intelligence: A Modern Approach, Third Edition, PrenticeHall, 2010.

REFERENCE BOOKS:

1. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivasankar B. Nair, The McGraw Hill publications, Third Edition, 2009.
2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO MACHINE LEARNING
(OPEN ELECTIVE – CSM (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: Programming for Problem solving,

Course Objectives:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses
- To understand the basic theory underlying machine learning.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.
- To be able to read current research papers and understands the issues raised by current research.

UNIT-I

The ingredients of machine learning, Tasks: the problems that can be solved with machine learning, Models: the output of machine learning, Features, the workhorses of machine learning.. (Text Book 1- page no: 1-80)

UNIT- II

Binary classification and related tasks: Classification, Scoring and ranking Beyond binary classification: Handling more than two classes, Regression, Unsupervised and descriptive learning. (Text Book 1- page no: 81-127)

UNIT-III

Intoduction of Concept Learning, Models: Decision trees, Ranking and probability estimation trees, Tree learning as variance reduction. (Text Book 1- page no: 129-156)

UNIT-IV

Rule models: Learning ordered rule lists, Learning unordered rule sets, The Perceptron: a heuristic learning algorithm for linear classifiers. (Text Book 1- page no: 194-218, 262-297).

UNIT- V

Support vector machines, Probabilistic models: The normal distribution and its geometric interpretations, Probabilistic models for categorical

Course Outcomes: After the completion of this course the students should be able to :

CO-1: Explain the theory underlying machine learning.
CO-2: Learn beyond binary classification.
CO-3: Recognize and implement various genetic algorithms.
CO-4: Construct algorithms to learn tree, to learn linear, non-linear models and Probabilistic models.
CO-5: Able to analyze the data.

TEXT BOOKS:

1. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
2. The R Book. Second Edition. Michael J. Crawley. 3. Machine Learning, Tom M. Mitchell, MGH.

REFERENCE BOOKS:

1. Understanding Machine Learning: From Theory to Algorithms, Shai Shalev-Shwartz, Shai BenDavid, Cambridge.
2. Machine Learning in Action, Peter Harington, 2012, Cengage.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

NEURAL NETWORKS
(OPEN ELECTIVE – CSM (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre requisites: None

Course Objectives:

- To understand the biological neural network and to model equivalent neuron models.
- To understand the architecture, learning algorithm and issues of various feed forward and feedback neural networks.

UNIT – I

Introduction: A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks Learning Process: Error Correction Learning,

UNIT – II

Memory Based Learning, Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process

Single Layer Perceptron : Adaptive Filtering Problem, Unconstrained Organization Techniques, Linear Least Square Filters, Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques,

UNIT-III

Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment Multilayer Perceptron: Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection.

UNIT-IV

Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection.

UNIT-V

Back Propagation and Differentiation, Hessian Matrix, Generalization, Cross Validation, Network Pruning Techniques, Virtues, and Limitations of Back Propagation Learning, Accelerated Convergence, Supervised Learning

Course Outcomes:

By completing this course the student will be able to:

CO-1: Describe different neural networks of various architectures
CO-2: Understand the feed forward and feed backward.
CO-3: Design the training of neural networks.
CO-4: Learn various learning rules.
CO-5: Develop the testing of neural networks and do the perform analysis of these networks for various pattern recognition application.

TEXT BOOKS:

1. Neural Networks a Comprehensive Foundations, Simon Haykin, PHI edition.

REFERENCE BOOKS:

1. Artificial Neural Networks – B. Yegnanarayana Prentice Hall of India P Ltd 2005
2. Neural Networks in Computer Intelligance , Li Min Fu TMH 2003
3. Neural Networks -James A Freeman David M S Kapura Pearson Education 2004.
4. Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO CYBER SECURITY
(OPEN ELECTIVE – CSM (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Prerequisites: Basic Computer knowledge.

Course Objectives:

- To introduce the methodologies and framework of ethical hacking for enhancing the security.
- To learn about cybercrimes and how they areplanned.
- To learn the vulnerabilities of mobile and wireless devices.
- To learn about the cyber-Law and legalperspectives.

UNIT – I

Introduction to Cybercrime: Introduction, Cybercrime and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, Cyber-crime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.
(Text Book-1 : Page no : 1 – 39)

UNIT – II

Cryptography: Introduction Cryptography, Steganography, Objectives of Cryptography: Confidentiality, Integrity, Authenticity, Non-repudiation, Accountability, Types of Attacks:
Passive Attacks, Active Attacks, Introduction to Symmetric key cryptography, Asymmetric Key Cryptography, Hashing. (Text Book-2)

UNIT – III

Cyber Offenses: How Criminals Plan Them: Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector.(Text Book-1 : Page no : 45 –78)

UNIT – IV

Cybercrime: Mobile and Wireless Devices:Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones. (Text Book-1 : Page no : 81-119)

UNIT – V

Tools and Methods Used in Cybercrime: Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horse and Backdoors, Steganography, DoS and DDoS attacks, SQL Injection, Buffer Overflow.(Text Book-1 : Page no :125-170)

Course Outcomes:

CO-1: After the completion of this course, the students should be able to
CO-2: Outline key terms and concepts in cyber law, intellectual property and cybercrimes.
CO-3: Understand basic cryptography and stenography.
CO-4: Explore the vulnerabilities, threats and cybercrimes posed by criminals.
CO-5: Identify various security challenges phased by mobile devices and identify various types of tools and methods used in cybercrime, develops the secure counter methods to maintain security protection.

TEXT BOOKS:

1 .Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA.

2. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education, 6th Edition

REFERENCE BOOKS:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

2. Introduction to Cyber Security, Chwan-Hwa (john) Wu, J. David Irwin. CRC Press T&F Group.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO DATA SCIENCE
(OPEN ELECTIVE – CSM (DATA SCIENCE))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(AI&ML) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: Basics of Computer science and Mathematics

Course Objectives:

- To understand the basic concepts of Data Science
- To learn data pre processing and techniques for data analytics
- Understand the statistical concepts for data science.

UNIT-I:

Introduction: What Is Data Science? How Does Data Science Relate to Other Fields? Data Science and Statistics, Computer Science, Engineering, and Business Analytics. Data Science, Social Science, and Computational Social Science, The Relationship between Data Science and Information Science, Information vs. Data, Skills for Data Science, Tools for Data Science, Issues of Ethics, Bias, and Privacy in Data Science.(TB1)

UNIT-II:

Data: Introduction, Data Types, Structured Data, Unstructured Data, Challenges with Unstructured Data, Data Collections, Open Data, Social Media Data, Multimodal Data, Data Storage and Presentation, Data Pre-processing, Data Cleaning, Data Integration, Data Transformation , Data Reduction, Data Discretization.(TB1)

UNIT-III:

Techniques: Introduction, Data Analysis and Data Analytics, Descriptive Analysis, Variables, Frequency Distribution, Measures of Centrality, Dispersion of a Distribution, Diagnostic Analytics, Correlations, Predictive Analytics, Prescriptive Analytics, Exploratory Analysis, Mechanistic Analysis, Regression.(TB1)

UNIT-IV:

Statistical Data Analysis: Role of statistics in data science, Kinds of statistics, Descriptive statistics, Inferential statistics, Probability theory , Random variables, Independence, Four perspectives on probability, Bayesian probability, Probability distribution .(TB2)

UNIT-V:

Machine Learning for Data Science: Overview of machine learning, Supervised machine learning , Regression methods, Classification methods, KNN classification, Decision tree classification, Naive Bayes classification, Unsupervised machine learning, Clustering methods, K-means, Principle Component Analysis (PCA), Association Analysis, Apriori algorithm, FP-Growth Analysis. (TB2)

Course Outcomes: After completing this course the students will be able to

CO1: Understand the basic concepts of Data Science.
CO2: Learn about types of data and data pre processing.
CO3: Understand the techniques for data analytics.
CO4: Learn the statistical fundamentals related to Data Science.
CO5: Understand the concepts of Machine Learning for Data Science.

TEXT BOOK

1. Chirag Shah, A Hands-On Introduction To Data Science, Cambridge University Press.
2. Data Science Fundamentals and Practical Approaches. Dr. Gypsy Nandi, Dr. Rupa Kumar Sharma.

REFERENCE BOOKS

1. Doing Data Science, Straight Talk from The Frontline. Cathy O'Neil and Rachel Schutt, O'Reilly, 2014.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

DATA HANDLING AND VISUALIZATION
(OPEN ELECTIVE – CSM (DATA SCIENCE))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(AI&ML) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: Fundamentals of Data Science

Course Objectives:

- Understand basics of Data Visualization
- Learn about visualization of distributions.

UNIT-I:

Introduction to Visualization: Visualizing Data-Mapping Data onto Aesthetics, Aesthetics and Types of Data, Scales Map Data Values onto Aesthetics, Coordinate Systems and Axes- Cartesian Coordinates, Nonlinear Axes, Coordinate Systems with Curved Axes, Colour Scales-Colour as a Tool to Distinguish, Colour to Represent Data Values ,Colour as a Tool to Highlight.

UNIT-II:

Directory of Visualizations- Amounts, Distributions, Proportions, x–y relationships, Geospatial Data. Visualizing Distributions: Visualizing Amounts-Bar Plots, Grouped and Stacked Bars, Dot Plots and Heatmaps, Visualizing Distributions: Histograms and Density Plots- Visualizing a Single Distribution, Visualizing Multiple Distributions at the Same Time.

UNIT-III:

Visualizing Proportions-A Case for Pie Charts, A Case for Side-by-Side Bars, A Case for Stacked Bars and Stacked Densities, Visualizing Proportions Separately as Parts of the Total ,Visualizing Nested Proportions-Nested Proportions Gone Wrong, Mosaic Plots and Treemaps, Nested Pies ,Parallel Sets.

UNIT-IV:

Visualizing Associations Among Two or More Quantitative Variables-Scatterplots, Correlograms, Dimension Reduction, Paired Data. Visualizing Time Series and Other Functions of an Independent Variable-Individual Time Series , Multiple Time Series and Dose–Response Curves, Time Series of Two or More Response Variables

UNIT-V:

Visualizing Trends-Smoothing, Showing Trends with a Defined Functional Form, Detrending and Time-Series Decomposition, Visualizing Geospatial Data-Projections, Layers, Choropleth Mapping, Cartograms, Visualizing Uncertainty-Framing Probabilities as Frequencies, Visualizing the Uncertainty of Point Estimates, Visualizing the Uncertainty of Curve Fits, Hypothetical Outcome Plots.

Course Outcomes: After completing this course the students will be able to

CO1: Understand the fundamentals of Data Visualization.
CO2: Learn the concepts of Visualizing Distributions
CO3: Understand how to Visualizing Proportions and Nested Proportions
CO4: Learn the concepts of Visualizing Associations and Time series data.
CO5: Understand the different Visualizing Trends

TEXT BOOK

1. Claus Wilke, “Fundamentals of Data Visualization: A Primer on Making Informative and Compelling Figures”, 1st edition, O’Reilly Media Inc, 2019.

REFERENCE BOOKS

1. Tony Fischetti, Brett Lantz, R: Data Analysis and Visualization,O’Reilly ,2016
2. Ossama Embarak, Data Analysis and Visualization Using Python: Analyze Data to Create Visualizations for BI Systems,Apress, 2018

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO BIG DATA
(OPEN ELECTIVE – CSM (DATA SCIENCE))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(AI&ML) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: DBMS

Course Objectives:

- To understand the basic concepts of Big Data
- To learn distributed computing and big data analytics
- Understand the fundamentals of Hadoop and Map Reduce.

UNIT-I:

Grasping the Fundamentals of Big Data: The Evolution of Data management, Understanding the Waves of Managing Data. Defining big data, Building a Successful Big Data Management Architecture, The Big Data Journey. Examining Big Data Types, Defining Structured Data, Defining Unstructured Data, Putting Big Data Together.(TB1)

UNIT-II:

Types of Digital Data: Classification of Digital Data: Structured data, Semi-structured data and Unstructured. Introduction to Big Data: Characteristics of Data, Evolution of Big Data, Definition of Big Data, Challenges with Big Data, What is Big Data?, Why Big Data?, Traditional Business Intelligence (BI) versus Big Data, A Typical Data Warehouse Environment, A Typical Hadoop Environment, What is New Today?, What is Changing in the Realms of Big Data? (TB2)

UNIT-III:

A Brief History of Distributed Computing, Giving thanks to DARPA, Understanding the Basics of Distributed Computing. Big Data Technology Components: Exploring the Big Data Stack, Big Data Analytics, Big Data Applications. Cloud and Big Data: Defining the Cloud in the Context of Big Data, Understanding Cloud Deployment and Delivery Models, Making Use of the Cloud for Big Data, Providers in the Big Data Cloud Market.(TB1)

UNIT-IV:

Introduction to Hadoop: Features and advantages and versions of Hadoop. Hadoop Ecosystems and distributions. Hadoop versus SQL. Introducing Hadoop, RDBMS versus Hadoop, Distributed Computing Challenges, History of Hadoop, Hadoop Overview, HDFS (Hadoop Distributed File System), Processing Data with Hadoop, Managing Resources and Applications with Hadoop YARN (Yet Another Resource Negotiator), Interacting with Hadoop Ecosystem: PIG, HIVE & HBase. (TB2)

UNIT-V:

MapReduce Fundamentals: Tracing the Origins of MapReduce, Understanding the map Function, Adding the reduce Function, Putting map and reduce Together, Optimizing MapReduce Tasks. Integrating Big Data with the Traditional Data Warehouse, Big Data Analysis and the Data Warehouse, Changing the Role of the Data Warehouse.(TB1)

Course Outcomes: After completing this course the students will be able to

CO1: Understand the importance of Big Data.
CO2: Learn about the types of data and Big Data Analytics.
CO3: Understand the Big Data technology components and applications.
CO4: Learn the basics of Hadoop Eco system.
CO5: Understand the map reduce fundamentals.

TEXT BOOK

1. Big Data for Dummies, Judith Hurwitz, Alan Nugent, Dr. Fern Halper, and Marcia Kaufman, Wiley
2. Big Data and Analytics, Seema Acharya, Subhasinin Chellappan, Wiley publications.

REFERENCE BOOKS

1. Big Data, Black BookTM , DreamTech Press, 2015 Edition.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTRODUCTION TO COMPUTER FORENSICS
(OPEN ELECTIVE – CSM (DATA SCIENCE))

B.Tech –CIVIL, EEE, MECH, ECE, CSE & CSE(AI&ML) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: Fundamentals of Computers

Course Objectives:

- Understand the fundamentals of computer forensics.
- Learn about the different computer forensics systems and data collection methods.
- Understand Computer Forensics Analysis.

UNIT-I:

Computer Forensics Fundamentals: Introduction to Computer Forensics, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/ Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps Taken by Computer Forensics Specialists. Types of Computer Forensics Technology: Types of Military Computer Forensic Technology and Business Computer Forensic Technology. Specialized Forensics Techniques, Encryption Methods and vulnerabilities, Protecting Data from Being Compromised.

UNIT-II:

Types of Computer Forensics Systems: Internet Security Systems, Intrusion Detection Systems, Firewall Security Systems, Storage Area Network Security Systems , Network Disaster Recovery Systems, Public Key Infrastructure Systems, Wireless Network Security Systems, Instant Messaging (IM) Security Systems, Net Privacy Systems, Identity management Security Systems, Identity Theft, Biometric Security Systems, Homeland Security Systems.

UNIT-III:

Computer Forensics Evidence and Capture: Data Recovery Defined, Data Back-up and Recovery, The Role of Back-up in Data Recovery, The Data-Recovery Solution. Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options, Obstacles, Types of Evidence, The Rules of Evidence ,Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collection, Artifacts, Collection Steps.

UNIT-IV:

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene, Computer Evidence Processing Steps, Legal Aspects of Collecting and Preserving, Computer Forensic Evidence. Computer Image Verification and Authentication: Special Needs of Evidential Authentication, Practical Consideration, Practical Implementation.

UNIT-V:

Computer Forensics Analysis: Discovery of Electronic Evidence, Electronic Document Discovery: A Powerful New Litigation Tool, Identification of Data: Timekeeping, Forensic Identification and Analysis of Technical Surveillance Devices. Reconstructing Past Events: How to Become a Digital Detective, Useable File Formats, Unusable File Formats, Converting Files.

Course Outcomes: After completing this course the students will be able to

CO1: Understand the definition of computer forensics fundamentals.

CO2. Describe the types of computer forensics technology. Analyze various computer forensics systems.

CO3. Illustrate the methods for data recovery, evidence collection and data seizure.

CO4. Summarize duplication and preservation of digital evidence. Evaluate the effectiveness of available digital forensics tools.

CO5. Employ fundamental computer theory in the context of computer forensics practices

Text Books:

1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.

Reference Books:

1. Real Digital Forensics by Keith J. Jones, Richard Bejtiich, Curtis W. Rose, Addison- Wesley Pearson Education
2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning.
3. Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MANAGEMENT SCIENCE
(OPEN ELECTIVE – MBA)

B.Tech – CIVIL, EEE, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: None

Course Objectives:

- This course is intended to familiarize the students with the framework for the managers and leaders available for understanding and making decisions relating to issues related organizational structure, production operations, marketing, human resource management, product management and strategy.

UNIT - I:

Introduction to Management and Organization: Concepts of Management and organization-nature, importance and Functions of Management, Systems Approach to Management - Taylor's Scientific Management Theory- Fayal's Principles of Management- Maslow's theory of Hierarchy of Human Needs- Douglas McGregor's Theory X and Theory Y - Hertzberg Two Factor Theory of Motivation - Leadership Styles, Social responsibilities of Management, Designing Organizational Structures: Basic concepts related to Organization - Departmentation and Decentralization, Types and Evaluation of mechanistic and organic structures of organization and suitability.

UNIT - II:

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

UNIT - III:

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

UNIT - IV:

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

UNIT - V:

Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

TEXT BOOKS:

1. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi, 2004.
2. P. Vijay Kumar, N. Appa Rao and Ashnab, Chnalill, Cengage Learning India, 2012.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane: Marketing Management, Pearson, 2012.
2. Koontz and Weihrich: Essentials of Management, McGraw Hill, 2012.
3. Thomas N. Duening and John M. Ivancevich Management - Principles and Guidelines, Biztantra, 2012.
4. Kanishka Bedi, Production and Operations Management, Oxford Uiversity Press, 2012.
5. Samuel C. Certo: Modern Management, 2012.
6. Schermerhorn, Capling, Poole and Wiesner: Management, Wiley, 2012.
7. Parnell: Strategic Management, Cengage, 2012.
8. Lawrence R Jauch, R. Gupta and William F. Clueck: Business Policy and Stragtegic Management Science, McGraw Hill, 2012.

Course Outcomes:

CO1 Outline the fundamentals of management and contributions to management.

CO2 Define the social Responsibilities of an organization towards stakeholders and build the suitable organization structure and to identify factors influencing plant location and layout decisions.

CO3 Know importance of materials management, evaluate quality of products using SQC techniques and Identify the basic concepts of marketing mix and Human Resource concepts.

CO4 Know how PERT and CPM different and to construct network by proper planning organizing an managing the efforts to accomplish a successful project.

CO5 Appraise all contemporary management practices and analyze how these contemporary management practices one applicable in modern business and service organizations.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENTREPRENEURSHIP DEVELOPMENT
(OPEN ELECTIVE – MBA)

B.Tech – CIVIL, EEE, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: None

Course Objective: The objective of the course is to make students understand the nature of entrepreneurship, and to motivate the student to start his/her own enterprise. The objective of the course is to enlighten with the fragrance of Corporate Good Governance and Business Ethics, so that they would become the best entrepreneurs / managers of the corporate world.

Unit – I

Nature of Entrepreneurship; Characteristics – Qualities and skills of an Entrepreneur – Functions of entrepreneur – Entrepreneur scenario in India and Abroad. Forms of Entrepreneurship: Small Business – Importance in Indian Economy – Types of ownership – Sole trading – Partnership – Joint stock company and other forms. First – Mover disadvantages, Risk Reduction strategies, Market scope strategy, Imitation strategies and Managing Newness

Unit – II

Aspects of Promotion: Generation of new entry opportunity, SWOT Analysis,Technological Competitiveness, legal regulatory systems, patents and trademarks, Intellectual Property Rights-Project Planning and Feasibility Studies- Major steps in product development. Financial Aspects: Sources of raising Capital, Debt-Equity, Financing by Commercial Banks, Government Grants and Subsidies, Entrepreneurship Promotion Schemes of Department of Industries (DIC), KVIC, SIDBI, NABARD, NSIC, APSFC, IFCI and IDBI. New Financial Instruments.

Unit - III

Introduction to Business Ethics: Necessity for Business Ethics-Need for Ethical guideline –Salient Issues in Ethics and Commerce- Ethics as a Luxury – Earlier attempts at Ethics in Industry – Justification for Ethics – Effect of Migration of National Character – Shadow Economy – Basic Principles in Ethics – Corporate Climate and corporate climate audits – Political Issues – Nature and theory of Ethics – The Naturalistic fallacy - G.E.Moore's Philosophy.

Unit – IV

Understanding Corporate Governance: Corporate Governance- Capitalism at crossroads – Historical perspective of Corporate Governance – Issues of Corporate Governance – Theoretical basis of Corporate Governance – Corporate Governance mechanisms – Indian Model of Governance – Good Corporate Governance – Corporate Governance committees – OECD Principles – Indian Committee and guidelines – The confederation of Indian Industry's initiative. Corporate Governance Models, Corporate Social Responsibility.

Unit – V

Corporate Social Responsibility: System Concept of Business Society – SocialResponsibility – Social Responsibility tools – approaches to Ethics – Corporate Social Accountability - Business in a Social World – Ethics and Social Responsibility – professional ethics – Ethics of practicing company secretaries- Ethical investing.

Text Books:

1. Robert D Hisrich, Michael P Peters, Dean A Shepherd: Entrepreneurship, TMH, 2009
2. Vasanth Desai: Entrepreneurship, HPH, 2009
3. C.S.V.Murthy: Business Ethics & Corporate Governance, Himalaya, 2009.

References:

1. Bholanath Dutta: Entrepreneurship Text and Cases, Excel, 2009
2. David Martin: Corporate Governance, Viva, 2009
3. H. Nandan: Fundamentals of Entrepreneurship, PHI, 2009.
4. Barringer: Entrepreneurship, Pearson,2009.
5. Ronald D Francis & Mukti Mishra: Business Ethics, TMH, 2009
6. RK Mishra,Gitarani: Corporate Governance, Excel,2009
7. A.C.Frenando: Corporate Governance, Pearson, 2006
8. V.Balachandran &V.Chandrasekaran: Corporate Governance & Social Responsibility, PHI, 2009
9. A.C.Fernando: Business Ethics, Pearson, 2009
10. Laura P Hartman & Abha Chatterjee: Business Ethics, TMH, 2009
11. Tripat Kaur: Values and Ethics in Management, 2/e, Paragon International,2009.

Course Outcomes:

CO1 Explain characteristics, Qualities, Skills and Functions of Entrepreneur.
CO2 Demonstrates Entrepreneur Scenario in India and abroad.
CO3 Summarizes necessity for business ethics and ethical guidelines in business.
CO4 Interprets about Government Grants and subsides and Entrepreneurship promotion schemes.
CO5 Prioritizes corporate social responsibility and professional ethics by company secretaries.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE – MBA)

B.Tech – CIVIL, EEE, MECH, ECE, CSE, CSE(AI&ML) & CSE(Data Science) **L/T/P/C**
3/ 0/ 0/ 3

Pre-requisites: None

Course Objectives:

- In the interest of the national economic growth the innovations and improvements are to be owed and used for the production and distribution process. The Students of technology willnbe benefited by knowing the process of obtaining recognition of their innovations. This course will enable them to know the legal process of registering the innovation.

UNIT – I

INTRODUCTION TO INTELLECTUAL PROPERTY: Introduction, types of intellectual property,International organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

TRADE MARKS: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter,selecting and evaluating trade mark, trade marks registration processes.

UNIT – III

LAW OF COPY RIGHTS: Fundamental of copy right law, originally of material, rights of reproduction,rights of perform the work publicity, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

LAW OF PATENTS: Foundation of patent law, patent searching process ownership rights and transfer.

UNIT- IV

TRADE SECRETS: Trade secrete law, determination of trade secrete status, liability for misappropriations oftrade secrets, protection for submission trade secrete litigation.

UNIT-V

NEW DEVELOPMENT OF INTELLECTUAL PROPERTY: New developments in trade mark law: Copyright law, patent law, intellectual property audits.

TEXT BOOOKS & REFERENCES:

1. Intellectual property rights, Deborah, E. Bouchux, cengage learing
2. Intellectual property right – Unleashing the knowledge economy, prabuddhaganguli, Tate Mc Graw Hill Publishing company ltd.

Course Outcomes:

CO1 Outline the increasing importance of Intellectual Property Rights
CO2 Utilize post registration procedures and trade mark registration process
CO3 Explain the copyright principles and rights
CO4 Prioritize the law of patents and patent ownership
CO5 Develop the trade secret and maintenance