Course Structure for B.Tech (Electronics & Communication Engineering)

Regular Programme Applicable for students admitted from 2016-17 Academic Year

B.Tech 1st Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Drg	C
1	16HS1101	Professional English-I	3	0	0	0	3
2	16HS1102	Calculus and Differential Equations	3	1	0	0	3
3	16HS1104	Applied Chemistry	3	1	0	0	3
4	16ME1102	Basic Mechanical and Civil Engineering	3	1	0	0	3
5	16CS1101	Computer Programming	3	0	0	0	3
6	16HS2108	Applied Chemistry Lab	0	0	3	0	2
7	16CS2102	Computer Programming Lab	0	0	3	0	2
8	16ME2103	Engineering Drawing Practice	0	0	0	3	2
		TOTAL	**15**	**3**	**6**	**3**	**21**

B.Tech 2nd Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Drg	C
1	16HS1201	Professional English-II	3	0	0	0	3
2	16HS1202	Integral Transformations	3	1	0	0	3
3	16HS1103	Applied Physics	3	1	0	0	3
4	16HS1105	Environmental Studies	3	0	0	0	3
5	16EE1202	Circuit Theory	3	1	0	0	3
6	16HS2106	Professional English Lab	0	0	3	0	2
7	16HS2107	Applied Physics Lab	0	0	3	0	2
8	16ME2104	Engineering Workshop and IT Workshop	0	0	3	0	2
		TOTAL	**15**	**3**	**9**	**0**	**21**

B.Tech 3rd Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16HS1301	Complex Analysis	3	1	0	0	3
2	16EE1304	Electrical Technology	3	0	0	0	3
3	16EC1301	Electronic Devices and Circuits	3	1	0	0	3
4	16EC1302	Probability Theory and Stochastic Processes	3	1	0	0	3
5	16EC1303	Signals and Systems	3	1	0	0	3
6	16EC1304	Switching Theory and Logic Design	3	0	0	0	3
7	16EE2308	Electrical Technology Lab	0	0	3	0	2
8	16EC2305	Electronic Devices and Circuits Lab	0	0	3	0	2
9	16EC2306	Signals and Systems Lab	0	0	3	0	2
10	16AS3301	Communication Skills Practice	0	0	0	3	1
11	16AS3302	Professional Society Activities-I	0	0	0	3	1
12		Audit Course					
		TOTAL	**18**	**4**	**9**	**6**	**26**

B.Tech 4th Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16HS1401	Matrices and Numerical Methods	3	1	0	0	3
2	16CS1407	Data Structures through C	3	0	0	0	3
3	16EC1401	Analog Circuit Analysis	3	1	0	0	3
4	16EC1402	Pulse and Digital Circuits	3	1	0	0	3
5	16EC1403	Electromagnetic Theory and Transmission Lines	3	1	0	0	3
6	16EC1404	Computer Architecture and Organization	3	0	0	0	3
7	16CS2411	Data Structures through C Lab	0	0	3	0	2
8	16EC2407	Analog Circuit Analysis Lab	0	0	3	0	2
9	16EC2408	Pulse and Digital Circuits Lab	0	0	3	0	2
10	16AS3401	Technical Seminar	0	0	0	3	1
11	16AS3402	Soft Skills Practice	0	0	0	3	1
12	16AS3403	Professional Society Activities-II	0	0	0	3	1
		TOTAL	**18**	**4**	**9**	**9**	**27**

B.Tech 5th Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16CS1402	OOPs through JAVA	3	0	0	0	3
2	16EC1501	Linear Integrated Circuits and Applications	3	1	0	0	3
3	16EC1502	Digital IC System Design	3	1	0	0	3
4	16EC1503	Linear Control Systems	3	1	0	0	3
5	16EC1504	Analog Communications	3	0	0	0	3
6	16EC1505	Antennas and Wave Propagation	3	1	0	0	3
7	16CS2409	OOPs through JAVA Lab	0	0	3	0	2
8	16EC2506	Linear IC Applications Lab	0	0	3	0	2
9	16EC2507	Digital IC System Design Lab	0	0	3	0	2
10	16AS3501	Term Paper	0	0	0	3	2
11	16AS3502	Quantitative Aptitude	0	0	0	3	1
12	16AS3503	Professional Activities-III	0	0	0	3	1
		TOTAL	**18**	**4**	**9**	**9**	**28**

B.Tech 6th Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16EC1601	VLSI Design	3	1	0	0	3
2	16EC1602	Electronic Measurements and Instrumentation	3	0	0	0	3
3	16EC1603	Digital Communications	3	1	0	0	3
4	16EC1604	Microprocessors and Microcontrollers	3	1	0	0	3
5	16EC1605	Digital Signal Processing	3	1	0	0	3
		ELECTIVE-I					
6	16EC1606	Digital Television	3	0	0	0	3
	16EC1607	Computer Networks					
	16EC1608	Telecommunication Switching Techniques					
	16EC1609	Available Selected MOOCs					
7	16EC2611	VLSI Design Lab	0	0	3	0	2
8	16EC2612	Analog and Digital Communication Lab	0	0	3	0	2
9	16EC2613	Microprocessors and Microcontrollers Lab	0	0	3	0	2
10	16EC2615	Mini Project	0	0	0	3	2
11	16AS3601	Technical Aptitude	0	0	0	3	1
12	16AS3602	Professional Society Activities-IV	0	0	0	3	1
		TOTAL	**18**	**4**	**9**	**9**	**28**

B.Tech 7th Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Oth	C
1	16MB1411	Engineering Economics and Project Management	3	0	0	0	3
2	16EC1701	Microwave Engineering	3	1	0	0	3
3	16EC1702	Embedded Systems	3	1	0	0	3
4	**ELECTIVE-II (OPEN ELECTIVE)**		3	1	0	0	3
5	**ELECTIVE-III**						
	16EC1703	DSP Processors and Architectures	3	1	0	0	3
	16EC1704	Wireless Communications and Networks					
	16EC1705	Optical Communications					
	16EC1706	Available Selected MOOCs					
6	16EC2709	Microwave Engineering Lab	0	0	3	0	2
7	16EC2710	Instrumentation and Measurements Lab	0	0	3	0	2
8	16EC2711	DSP and Embedded Systems Lab	0	0	3	0	2
9	16AS3701	Internship	0	0	0	3	2
10	16AS3702	Professional Society Activities-V	0	0	0	3	1
		TOTAL	**15**	**4**	**9**	**6**	**24**

B.Tech 8th Semester – Electronics & Communication Engineering

S.No	Code	Course	L	T	P	Oth	C
1	**ELECTIVE-IV**						
	16EC1801	Cellular and Mobile Communication	3	1	0	0	3
	16EC1802	Radar Engineering					
	16EC1803	ASIC Design					
	16EC1804	Neural Network and Fuzzy Logic					
2	**ELECTIVE-V**						
	16EC1805	Satellite Communications	3	1	0	0	3
	16EC1806	Digital Design through HDL					
	16EC1807	Micro Electro Mechanical Systems					
	16EC1808	Available Selected MOOCs					
3	**ELECTIVE-VI**						
	16EC1809	Data Communications	3	1	0	0	3
	16EC1810	RFID Technology					
	16EC1811	Virtual Instrumentation					
	16EC1812	Available Selected MOOCs					
4	16EC2814	Major Project and Comprehensive Viva-Voce	0	0	8	0	12
		TOTAL	**9**	**3**	**8**	**0**	**21**

ELECTIVE-II (OPEN ELECTIVE)

S.No	Code	Course
1	16CE1707	Disaster Management
2	16CE1708	Infrastructure Systems Planning
3	16EE1707	Renewable Energy Sources
4	16EE1708	Energy Auditing
5	16ME1708	Industrial Robotics
6	16ME1709	Nano Material Applications
7	16EC1707	Digital Image Processing (not for ECE)
8	16EC1708	Electronic Product Design & Packaging
9	16EC1709	Bio-Medical Instrumentation
10	16CS1708	Internet of Things
11	16CS1709	Open System Software
12	16MB1302	Entrepreneurship Development

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

B.Tech 1ˢᵗ Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	0	0	0	3

16HS1101   PROFESSIONAL ENGLISH-I

COURSE OUTCOMES:
At the end of the course students able to
1 Developed functional skills for Professional practice through English
2 Gained the ability to effectively communicate with members of society in general and engineering community in particular.
3 Inculcated an attitude to upgrade competence of English knowledge and communication.
4 Acquired fundamental and functional knowledge of English language, grammar and communication skills.
5 Identify and analyze productive skills and receptive skills.

UNIT-I

The Road Not Taken by **Robert Frost**
Communication: Importance of Communication – Language as a tool of Communication – Communicative Skills (Listening, Speaking, Reading and Writing), vocabulary words, prefixes, suffixes, common errors, Verbal and Non-Verbal communication.

UNIT-II

Well Party for Miss Pushpa T.S. by **Nissim Ezekiel**
Fare Writing: Effective Sentence construction strategies – Grammaticality, removing ambiguity in sentences.

UNIT-III

No Men are Foreign by **James Kirkup**
Reading: Reading – Intensive and Extensive, Skimming, Scanning, paragraph writing, unity of theme, coherence, pattern of paragraph development.

UNIT-IV

Exercises on Letter Writing and Technical Report Writing.
Remedial Grammar: Tenses**,** Use of Articles and Prepositions, Voice, Reported Speech.

TEXT BOOKS:

1 Text: Vibrant English 2014 Orient Black Swan
2 Meenakshi Raman and Sangeetha Sharma, Technical Communication, Oxford University Press, New Delhi, 2012.

REFERENCE BOOKS:

1   M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw–Hill, Publishing Company Limited, First Edition, 2005.
2   Martin Hewings, Adv. English Grammar: A Self Study Reference and Practice Book for Advanced South Asian Students, Cambridge University press, First South Asian Edition, New Delhi, 1999.

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B.Tech 1st Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16HS1102   CALCULUS AND DIFFERENTIAL EQUATIONS

COURSE OUTCOMES:

At the end of the course students able to

1   Find the solutions for maxima and minima problems which appear in engineering problems.
2   Understand the concepts of curvature and use them in various engineering disciplines.
3   Evaluate areas and volumes using multiple integrals.
4   Gain the knowledge of vector differentiation and solve the problems of various engineering disciplines acquire the knowledge of differential equations.
5   Summarize and utilize them in various Engineering Problems.
6   Form and solve various PDEs.

UNIT-I

Functions of Several variables

Functions of two or more variables – Partial Derivatives – Total derivative – Jacobians – Taylor's theorem for functions of two variables (without proof) – Maxima and Minima of functions of two variables and Lagrange's method of undetermined multipliers

UNIT-II

Curvature and Multiple Integrals

Curvature – Radius of Curvature for Cartesian and Polar Curves - Radius of Curvature at the origin - Evaluation of Double Integrals – Change of Order of Integration - Change of Variables- Evaluation of Triple Integrals Areas and Volumes using multiple integrals.

UNIT-III

Differentiation of vectors – Gradient – Divergence – Curl – Line Integral - Gauss's Divergence Theorem, Green's theorem in a plane, Stoke's Theorem (without proofs).

UNIT-IV

Differential Equations (0DE & PDE)

Differential equations of first order-Exact, linear and Bernoulli equations- Orthogonal trajectories, Newton's cooling, law of growth and decay- Illustrations.

Differential equations of second and higher order- with RHS terms e^{ax}, Sin ax / Cos ax, x^n(n is +ve integer), $e^{ax}V$ [V is sin ax or cos ax or polynomial in x], x^nV [V is sin ax/ cos ax] - Variation of parameters - Applications to Oscillatory Electrical Circuits –Formation of PDEs by the elimination of arbitrary constants and arbitrary functions-Method of separation of variables.

TEXT BOOKS:

1   Higher Engineering Mathematics - Dr. B.S. Grewal – 42nd Edition - Khanna Publications.

2   A Text Book of Engineering Mathematics – I - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013.

REFERENCE BOOKS:

1   Advanced Engineering Mathematics – E. Kreyzig – 10th Edition – Wiley Publications.

2   A Text Book of Engineering Mathematics, B.V. Ramana - Tata McGraw Hill Publications

3   Advanced Engineering Mathematics – RK Jain & SRK Iyengar – Revised edition – Taylor & Francis – 2002.

4   E.Rukmangadachari & E. Keshava Reddy, Engineering Mathematics, Volume-I, 2nd Edition-Pearson publishers.

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B.Tech 1st Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16HS1104   **APPLIED CHEMISTRY**

COURSE OUTCOMES:
At the end of the course students able to

1   Apply the knowledge of working principle of batteries in engineering areas.
2   Apply the corrosion technology methods in various fields.
3   Implement various water purification methods in industries.
4   Describe the boiler troubles and estimations of hardness.
5   Know the application and manufacture of new polymers for industrial demand.
6   Know the knowledge of advanced polymer for different application.

UNIT-I

Electrochemistry and Corrosion Science
Conductance, Equivalent conductance, Molecular conductance, application of conductance, Conductometric Titration –acid vs. base, Electrochemical cell and its applications. Numerical calculation conductivity and electrochemical cell.
Batteries: Ni-Cad cell, Lithium Cells, Fuel Cells, Hydrogen – Oxygen fuel cell, Methanol Fuel cell.

Corrosion-definition, examples, effects- Mechanism of Dry corrosion and wet corrosion. Factor Influencing corrosion, corrosion control methods-sacrificial anode, impressed current, inhibitors, Electroplating (Ni &Cr) and Electro less plating (Cu and Ni).

UNIT-II

Water Technology-I: sources and impurities of water, water treatment for drinking purpose-disinfection and concept of break –point chlorination –Desalination of brakish water-Principle and process of electro-dialysis and reverse osmosis.
Water Technology-II: Boiler troubles –Scales, sludges, caustic embrittlement and boiler corrosion-causes, disadvantages and prevention, internal conditioning methods-phosphate, calgon and sodium aluminate-External treatment methods- ion-exchange methods. Estimation of Hardness, Dissolved oxygen, Alkalinity and chlorides.

UNIT-III

Polymer Technology: Polymerization-addition, condensation. Thermoplastics and thermosetting, preparation properties and application of Bakelite, Nylon, Teflon. Synthetic rubber, Buna S, Buna N, Poly-urethane, Thiokol rubbers. Conducting polymers-examples classification intrinsically conducting polymers and extrinsically conducting polymer, doping conducting polymers. Liquid Crystals-definition, properties and classification application. Natural rubber, Vulcanization, compounding of rubber. Inorganic polymer-Silicones.

UNIT-IV

Engineering Materials and Fuel Technology

Cement-types-Portland cement-composition, setting and hardening of Portland cement.
Lubricants: classification with examples, properties of lubricants –viscosity, flash point, fire point, cloud point, pour point.
Fuel Technology: Introduction, classification, solid fuel-Otto-Hoffmann's process, liquid fuel-Fischer-Tropsch Process. Calorific value, units of calorific value, Determination of calorific value of solid fuel by Bomb calorimeter. Numerical calculation for calculating of calorific values.

TEXT BOOKS:

1   Engineering Chemistry by Jain and Jain, DhanpatRai Publishing Company, New Delhi.
2   A text book of Engineering Chemistry by S.S.Dara, S. Chand and Company Limited, New Delhi.
3   Engineering Chemistry by K.N. Jayaveera, G.V.Subba Reddy, C. Ramachandraiah, McGraw Hill (Pvt), New Delhi.

REFERENCE BOOKS:

1   A text book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai &Co (Pvt) Ltd, New Delhi.
2   Text book of Engineering Chemistry, C.Parameswara Murthy, C.V. Agarwal, Andra Naidu, B.S. Publications, Hyderabad.

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B.Tech 1st Semester – ECE	L	T	P	Oth	C
	3	1	0	0	3

16ME1102   BASIC MECHANICAL AND CIVIL EMNGINEERING

PART-A

MECHANICAL ENGINEERING

COURSE OUTCOMES:

At the end of the course students able to

1. Develop capacity to predict the effect of force and motion in the course of carrying out the design functions of engineering
2. Apply knowledge of trigonometry, calculus, and algebra to obtain solutions of elementary problems in engineering mechanics.
3. Provide preliminary information useful in design of components in a multi-body system under constraints.
4. Train the students to apply fundamental knowledge of basic science for selection and processing of material for engineering applications.
5. Identify structures and properties of different materials.

UNIT-I

Basics of Engineering Mechanics: Basic Concepts of Engineering Mechanics: Characteristics of a force – various types of force systems – Resultant – Composition and resolution of forces – Principles of moments of force – Couples.

Resultants of Force System: Resultants of different types of force systems.
Centroid and Centers of Gravity: Definition – Centroid and centers of gravity simple bodies.

UNIT-II

Moments of Inertia: Definition – Parallel axis theorem for areas – Second moments of areas by integration – Radius of gyration of areas – Moments of inertia of simple areas.
Simple Stresses and Strains: Elasticity and plasticity – Types of stresses & strains – Hooke's law – stress & strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Elastic module & the relationship between them.
Composite Materials: Classification of composites, various methods of component manufacture of composites, particle – reinforced materials, fiber reinforced materials, polymer composites.

PART-B
CIVIL ENGINEERING

COURSE OUTCOMES:

At the end of the course students able to

1. Illustrate the fundamental aspects of Civil Engineering.
2. Explain the concepts of surveying for making horizontal and vertical measurements.

3   Illustrate the uses of various building materials and explain the method of construction of different components of a building.

4   Students will be able to discuss about various services in a building.

UNIT-III

General Introduction to Civil Engineering - Various disciplines of Civil engineering, Relevance of Civil engineering in the overall infrastructural development of the country. Introduction to types of buildings as per NBC; Selection of site for buildings. Components of a residential building and their functions. Introduction to industrial buildings – office / factory / software development office / power house /electronic equipment service centre (any one related to the branch of study).

Note: Students have to visit one such building and submit an assignment about the features of any one of the listed building related to their branch (Not included for exam).

Building materials - Bricks, cement blocks - Properties and specifications. Cement – OPC, properties, grades; other types of cement and its uses (in brief).Cement mortar – constituents, preparation. Concrete – PCC and RCC – grades. Steel - Use of steel in building construction, types and market forms.

UNIT-IV

Surveying - Principles and objectives of surveying; Horizontal measurements – instruments used – tape, types of tapes; Ranging (direct ranging only) – instruments used for ranging. Leveling - Definitions, principles, Instruments (brief discussion only) -Level field book - Reduction of levels - problems on leveling (height of collimation only).Modern surveying instruments – Electronic distance meter, digital level, total station, GPS (Brief discussion only).

TEXT BOOKS:

1   B. Bhattacharya, Engineering Mechanics- Oxford University Publications, 2009.
2   S.S. Bhavikatti, Engineering Mechanics, New Age Internationals, 2nd edition, 2010.
3   Introduction to Physical Metallurgy / Sidney H. Avener.
4   Essential of Materials science and engineering/ Donald R.Askeland/Thomson.
5   S.S. Bhavikatti, Basic Civil Engineering, New age international publishers.
6   Rangwala, Essentials of Civil Engineering, Charotar Publishing House.

REFERENCE BOOKS:

1   Material Science and Metallurgy/kodgire.
2   Science of Engineering Materials / Agarwal
3   A. K. Tayal, "Engineering Mechanics", Umesh Publications, 2005.
4   Ferdinand.L.Singer, Engineering Mechanics (Statics and Dynamics), Harper Row Publishers.2007.
5   Anurag A. Kandya, Elements of Civil Engineering, Charotar Publishing house.
6   Rangwala S C and Ketki B Dalal, Engineering Materials, Charotar Publishing house.
7   Rangwala S C and Ketki B Dalal, Building Construction, Charotar Publishing house.
8   R. Chudley, Construction Technology, Vol. I to IV, Longman Group, England.

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B.Tech 1ˢᵗ Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	0	0	0	3

16CS1101   **COMPUTER PROGRAMMING**

COURSE OUTCOMES:
At the end of the course students able to
1 Design algorithmic solution to problems.
2 Acquire knowledge about the basic concept of writing a program.
3 Understand the role of constants, variables, identifiers, operators, and type conversions of C Language
4 Ability to design programs Decision making and utilizing repetition.
5 Ability to design modular programs using functions.
6 Concept of Array and pointers dealing with memory management.

UNIT-I

Introduction to Computers and Programming:
Definition, Block diagram along with computer components, Characteristics & classification of computers, Types of programming languages.
Problem solving: top-down design, implementation of algorithms, Flow charts.
Introduction to C Language – History of C, features of C , General form of a C Program, character set in C, C-Tokens, Data types, Expression Evaluation, Operators and Expressions, Type Conversions, Formatted Input and Output

UNIT-II

Control Statements and Functions:
Decision Statements: If, if-else, nested if and switch Statements, Loop Control Statements - while, for, do-while Statements, Nested Loops, and Other Related Statements - break, continue, go to.
Functions: Function prototype, definition and accessing, passing arguments to a function, Library Functions, Scope of a function, Storage Classes - Auto, Register, Static, Extern, Scope rules, Type qualifiers, Recursion - Recursive functions, C Preprocessor, header files

UNIT-III

Arrays, Pointers and Strings:
Arrays: introduction, 1-Dimensional, 2-dimensional array, Declaration, Initialization and Accessing, Multidimensional Arrays.
Pointers: Introduction, Features of Pointers, Pointer Declaration, Arithmetic Operations with Pointers, Pointers and Arrays, Array of Pointers, Pointers to Pointers, Void Pointers, Memory Allocation Functions, Pointer to Functions, Command- Line Arguments.

Strings: String Basics, String Handling Functions

UNIT-IV

Structure and Union:

Structure and Union: Introduction, Features of structure, Declaration and Initialization of Structure, Structure within Structure, Array of Structures, Pointer to Structure, self referential Structures, Structures and Functions, type def and Enumerated data types, Unions, Bit fields.

Files: Introduction, Streams and file types, file operations

TEXT BOOKS:

1   Byron S Gottfried, Jitender Kumar Chabra, Programming with C, Third Edition, Mc Graw Hill Pvt. Ltd.
2   Jeri R Hanly, Elliot B. Koffman, Ashok Kamthane, A. Ananda Rao, Programming in C and data structures, Pearson Education.

REFERENCE BOOKS:

1   R. G. Dromey, How to Solve it by Computer, Person Education, 2008.
2   B. A. Forouzan and R.F. Gilberg, C Programming & Data Structures, Third Edition, Cengage Learning, 2000.
3   Stephen G. Kochan, Programming in C –III Edition, Pearson Educataion, 2004.
4   J.A. Jones & K. Harrow, C Programming with problem solving, Dream tech Press.

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(AUTONOMOUS)

B.Tech 1st Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16HS2108   **APPLIED CHEMISTRY LAB**

COURSE OUTCOMES:

At the end of the course students able to

1. Handle different glassware and apparatus and learn the skill in executing volumetric type experimental procedure.
2. Prepare some simple polymers.
3. Know the characteristics of lubricants and be able to modify lubricants according to purpose.
4. To take care of pollution control measures in industry.
5. To learn the desirable limits of various constituents in water analysis and its importance.

LIST OF EXPERIMENTS

S.No   **Name of the Experiment**

1. Estimation of dissolved oxygen in water samples.
2. Preparation of standard EDTA solution and estimation of hardness of water.
3. Corrosion of mild steel in acid and influence of an inhibiter thio urea.
4. Preparation of standard potassium dichromate solution and estimation of ferrous ion.
5. Determination of calorific value of solid fuel by using Bomb Calorimeter.
6. Determination of strength of given strong acid and strong base solution by conductometric titrations.
7. Estimation of chloride ion in water sample by Mohr's method.
8. Determination of viscosity of the oil through redwood viscometer
9. Determination of alkalinity of water.
10. Preparation of Phenol-Formaldehyde Resin (Bakelite).

TEXT BOOKS:

1. Quantitative Analysis by A.I. Vogel.
2. Engineering Chemistry Lab Manual by K.Gouru Naidu.
3. Laboratory Manual on Engineering Chemistry, S.K.Bhasin and Sudha Rani, 2nd Edition, Dhanpat Rai Publishing Company, New Delhi.

REFERENCE BOOKS:

1. Text Book of Engineering Chemistry by R.N. Goyal and Harrmendra Goel.
2. A text book on experiments and calculations-Engineering Chemistry. S.S. Dara.

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B.Tech 1ˢᵗ Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16CS2102   **COMPUTER PROGRAMMING LAB**

COURSE OUTCOMES:

At the end of the course students able to

1. Understand the basic concept of C Programming, and its different modules that include conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming.
2. Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
3. Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
4. Structures and unions through which derived data types can be formed
5. File Handling for permanent storage of data or record.

LIST OF EXPERIMENTS

Exercise-1
Programs on Expressions.
Exercise-2
Programs on decision control statements.
Exercise -3
Programs on loop statements.
Exercise -4
Programs to implement on functions.
Exercise -5
Programs to implement on parameter passing techniques.
Exercise -6
Programs using recursion.
Exercise-7
 Programs using arrays.
Exercise -8
 Programs to implement string handling functions.
Exercise -9
 Programs to implement on pointers.
Exercise -10
Programs to implement on structures.
Exercise -11
Programs on files.
Exercise -12
 Programs on command line arguments.

TEXT BOOKS:

1. Byron S Gottfried, Jitender Kumar Chabra, Programming with C, , Third Edition, McGraHill Pvt. Ltd
2. Jeri R Hanly, Elliot B. Koffman, Ashok Kamthane, A. Ananda Rao, Programming in C and data structures, Pearson Education

REFERENCE BOOKS:

1. R. G. Dromey, How to Solve it by Computer, Person Education,2008
2. B.A.Forouzan and R.F. Gilberg, C Programming & Data Structures, Third Edition, Cengage Learning,2000
3. Stephen G. Kochan,Programming in C –III Edition, Pearson Educataion,2004
4. J.A. Jones & K. Harrow ,C Programming with problem solving, Dreamtech Press
5. Harry H. Cheng,C for engineers and scientists an interpretive approach, , McGraHill International Pvt. Ltd
6. E.Balagurusamy, C Programming & Data Structures, TMH,2009

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

B.Tech 1st Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16ME2103   **ENGINEERING DRAWING PRACTICE**

COURSE OUTCOMES:

At the end of the course students able to

1 Convey visual perception information regarding relative locations of objects through an orthographic/isometric view.
2 Analyze a drawing and bring out any inconsistencies to put forth inferences graphically.
3 Create feasible designs of simple objects with drawing tools and/or free-hand.
4 Get training in the transformation of the imagined data to present as drawings so that the communication skill will be increased especially in technical subjects.
5 Impart the training in multi-view representations and its conversion into pictorial views and the reverse also.
6 Understand the different standards in technical drawing and to help in reaching future engineering positions especially in research and design.

UNIT-I

Introduction to Engineering Drawing: Geometrical Constructions-Construction of Polygons.
Conic Sections
Ellipse: Eccentricity method, Oblong method, Parallelogram method, Arc's of Circles method and Concentric Circles method.
Parabola: Eccentricity method, Rectangle method, Tangent method, Parallelogram method.
Hyperbola: Eccentricity method, Rectangular hyperbola, Asymptotes method, two branches of Hyperbola (Arc's of Circles method), Abscissa- Ordinate- method.
Cycloids: General Cycloid, Epi -Cycloid, Hypo-Cycloid.

UNIT-II

Projections of Points, Straight Lines, Planes:
Points: Introduction to Orthographic Projections, Describing of quadrants, First and Third angle projection – Position of points in 4 quadrants.
Straight Lines: Lines parallel to both the principal planes, perpendicular to one plane and parallel to another plane, lines inclined to one plane, lines inclined to both the planes, finding true lengths, true inclinations.
Planes: Projection of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes.

UNIT-III

Projection of Solids, Sections and Development of Solids with Auto -CAD
Solids: Positions of regular solids(prism, cylinder, pyramid and cone) – Projection of Solids – Axis perpendicular to one plane and parallel to another plane, inclined to one plane and inclined to both the planes, Axis parallel to both the Principal planes.
Section of Solids: Section Planes and Sectional views of Right Regular Solids–Prism, Cylinder, Pyramid and Cone. True shapes of the sections.
Development of Solids: Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid, Cone and their Sectional parts.

UNIT-IV

Isometric and Orthographic Projections with AUTO-CAD
Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines.
Orthographic Projections – Conversion of pictorial views into orthographic views.

TEXT BOOKS:

1   N.D. Bhat, Engineering Drawing, Charotar Publishers, 52nd Revised and Enlarged: 2013.
2   K.L. Narayana, P. Khanniah, Engineering Drawing, Publisher, Scitech.

REFERENCE BOOKS:

1   Venugopal, K., A Textbook of Engineering Graphics, New age Publishers, 2009.
2   Venkata Reddy, Engineering Drawing, B.S.Publishers, 2009.
3   Basant Agrawal, C M Agrawal, Engineering Drawing, 2013.
4   V.Ramesh Babu, Engineering Drawing, 2009.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
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B.Tech 2nd Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	0	0	0	3

16HS1201   **PROFESSIONAL ENGLISH-II**

COURSE OUTCOMES:
At the end of the course students able to
1   Use English language skills at basic level.
2   Recognize the personal enrichment to be gained from a love of English, literature and learning.
3   Acquired ability to interact politely and cooperate with others.
4   Identify and compare different kinds of Resume styles.
5   Design and develop functional skills in Professional contexts.

UNIT-I

Text: The Eyes are Not Here by Ruskin Bond.

Communication: Short oral presentation ,Group Discussion- definition, types, structure, practice, Dynamics of group, clarity in thought and expression, Dos and Don'ts of GD.

UNIT-II

Text: The Open Window by Saki.
Communication: Resume Writing, format of Cover Letter.

UNIT-III

Text: The Romance of a Busy Broker by O Henry.
Communication: Interview Skills, Types of Interviews, Pre Interview Techniques, Types of Questions and Answering Strategies.

UNIT-IV

Exercises on Common Errors in English, If- Clauses', One Word Substitutions, Idioms and Phrases, Words often Confused, Pre-fixes and Suffixes.
Text: Vibrant English 2014 Orient Black Swan.

REFERENCE BOOKS:

1   Meenakshi Raman and Sangeetha Sharma, Technical Communication, Oxford University Press, New Delhi, 2012.
2   M. Ashraf Rizvi, Effective Technical Communication, Tata Mc Graw–Hill, Publishing Company Limited, First Edition, 2005.
3   Practical English Usage by Michael Swan, 3rd Edition, OUP.
4   Intermediate English Grammar by Raymond Murphy, CUP

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B.Tech 2nd Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

13HS1202   **INTEGRAL TRANSFORMATIONS**

COURSE OUTCOMES:

At the end of the course students able to

1. Gain the concepts of Laplace and inverse Laplace transforms.
2. Solve the ordinary differential equations with initial conditions using Laplace transforms.
3. Expand various algebraic, trigonometric and hyperbolic functions in Fourier series in different intervals.
4. Solve the various boundary value problems using Fourier transforms.
5. Obtain the knowledge of Z and inverse Z – transforms.
6. Compute the solutions of difference equations using Z – transforms.

UNIT-I

Laplace Transforms (LTs)

Laplace transforms of elementary functions – Properties - Transforms of derivatives, integrals –Unit step function-Dirac delta function- Periodic function

Inverse Laplace transforms by Partial fractions – Properties - Convolution theorem – Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT-II

Fourier series (FS)

Euler formulae (without proof) – Expansion of functions as a Fourier series –Change of Interval – Even and odd functions – Half range series – Complex form of Fourier series.

UNIT-III

Fourier Transformations (FTs)

Fourier Integral theorem (without proof) – Fourier transformations – Properties - Sine and Cosine transformations - Inverse Fourier transformations – Convolution – Parseval's Identity.

UNIT-IV

Z - Transformations (ZTs)

Z – Transforms of elementary functions – Properties – Shifting theorems– Initial and Final value theorems - Inverse Z – transforms by convolution and partial fractions – Applications to first and second order difference equations.

TEXT BOOKS:

1. Higher Engineering Mathematics – 42nd Edition - Dr. B.S. Grewal - Khanna publications.
2. A Text Book of Engineering Mathematics – II - T.K.V. Iyengar, B. Krishna Gandhi and

Others - S. Chand & Company – Revised edition 2013.

REFERENCE BOOKS:

1   Advanced Engineering Mathematics – E. Kreyzig – 10th Edition – Wiley Publications.
2   A Text Book of Engineering Mathematics – I - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013.
3   Advanced Engineering Mathematics – RK Jain & SRK Iyengar – Revised edition – Taylor &Fransis – 2002.
    E.Rukmangadachari& E. KeshavaReddy ,Engineering Mathematics , Volume-I&II, 2nd
4   Edition-Pearson publishers.

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B.Tech 2nd Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16HS1103   **APPLIED PHYSICS**

COURSE OUTCOMES:

At the end of the course students able to

1. Understand the super position effects like Interference, Diffraction and Polarization and to list the types of optical fibers and using optical fibers in modern communication system and medical field.
2. Interpret the different crystal systems, crystal structure determination by X-rays.
3. Summarize the concepts of LASERS, different types of LASERS and its applications.
4. Study Quantum Mechanics and how Quantum Mechanics is carried out in the fields like medicine and industry.
5. Understand the concepts of Superconductivity and to understand properties of Magnetic and Dielectric Materials and its applications.
6. Analyze various types of Nanomaterials, significance of low dimensional materials, useful applications of Nanotechnology in various field like medicine, biological, chemical, industrial and many important areas in science and technology.

UNIT-I

Optics

Interference: Introduction – Interference in thin film by reflection –Newton's rings.

Diffraction: Introduction - Fraunhoffer diffraction due to single slit, Diffraction grating.

Polarization: Types of polarization-Nicol's prism-production and detection of different polarizations.

UNIT-II

Fiber Optics & Lasers

Fiber optics: Construction of optical fiber-Principle of optical fiber- Acceptance angle and acceptance cone - Numerical aperture- Types of optical fibers – Optical fiber communication system and its advantages - Applications of optical fibers.

Lasers*: Introduction-Characteristics of laser – Spontaneous and stimulated emission of radiation – Population inversion - pumping methods -Ruby laser- He-Ne laser - Applications of lasers.

UNIT-III

Principles of Quantum Mechanics and Semiconductors

Principles of Quantum Mechanics*: Waves and particles – de-Broglie hypothesis- Matter waves-Heisenberg uncertainty principle - Schrodinger's time independent wave equation – Physical significance of wave function - Particle in one dimensional infinite potential box.

Semiconductors: Introduction-Fermi level in Intrinsic and Extrinsic semiconductors-law of

mass action – Drift & diffusion currents - Einstein's equation – Hall Effect.

UNIT-IV

Crystallography, Superconductors and Nano Materials
Crystallography and X-Ray Diffraction: Introduction – Space lattice-Basis –Unit cell – Lattice parameters –Bravais lattices – Crystal systems- Expression for lattice constant–Packing fractions of SC, BCC and FCC – Miller indices – Expression for Interplanar spacing in cubic crystals – X-ray diffraction - Bragg's law.
Superconductors: Introduction - properties of super conductors - Meissner effect – Type I and Type II superconductors – BCS theory- Applications of superconductors.
Magnetic Materials: Basic Definitions-classification of magnetic materials-hysteresis-soft and hard magnetic materials.
Dielectric Materials: Basic Definitions-Internal Field-Clausius-Mossitti Equation-Dielectric Loss-Applications.
Nano materials: Basic principles of nanomaterials – properties of nanomaterials: Physical, optical, thermal, mechanical and magnetic properties–Applications of nanomaterials.

TEXT BOOKS:

1   K.Thyagarajan, Engineering Physics, I Edition 2013, Tata Macgraw Hill.
2   P.K.Palanisamy , Engineering Physics, II Edition 2010 Scitech Publishers.

REFERENCE BOOKS:

1   A.J. Dekkar , Solid State Physics , Latest edition, 2012. McMillan Publishers.
2   M. Arumugam , Engineering Physics II Edition, 1997 , Anuradha Publications.
3   S. ManiNaidu ,Engineering Physics, I Edition, 2012. Pearson Education.
4   Gaur and Gupta Dhanapati , Engineering Physics, 7th Edition, 1992 Rai Publishers.

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(AUTONOMOUS)

B.Tech 2nd Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	0	0	0	3

16HS1105   **ENVIRONMENTAL STUDIES**

COURSE OUTCOMES:

At the end of the course students able to

1 Apply their knowledge in biology, chemistry, physics, earth science and economics for better understanding of earth's environment.
2 Understanding the importance of natural resources.
3 Comprehend the environmental problems from multiple perspectives with emphasis on human modern lifestyle and developmental activities.
4 Recognize the inter connectedness of human dependence on the earth's ecosystems.
5 Understanding the value of biodiversity and the conservation of biodiversity.
6 Influence his society in proper utilization of goods and services.

UNIT-I

Introduction to Environmental Studies & Natural Resources

Environment: Definition, scope, need for public awareness.

Natural Resources: Renewable &Non renewable resources.

Forest Resources: Use, Deforestation-Case Studies;

Water Resources: Use, Over-exploitation of surface and ground water, Environmental impacts of Dams, Floods and Droughts;

Food Resources: Changes caused by agriculture, over grazing; Effects of modern agriculture- fertilizer, pesticide problems, water - logging and salinity;

Energy Resources: Renewable &non renewable energy resources, Use of alternate energy sources.

UNIT-II

Ecosystems & Biodiversity

Ecosystems: Definition, Structure of an ecosystem.

Functions of ecosystem- Food chains, Food web, Energy flow, Ecological pyramids

Types of Ecosystems: Forest Ecosystem, Aquatic Ecosystem.

Biodiversity: Definition, levels of biodiversity, Value of biodiversity, Hotspots of biodiversity,

India as mega biodiversity nation, Threats to biodiversity- Poaching, Habitat loss, Endangered & endemic species of India, Conservation of biodiversity: In-situ & Ex-situ conservation.

UNIT-III

Environmental Pollution

Pollution: Definition, Causes & Control measures of Air pollution, Water pollution, Soil pollution, noise pollution, Solid waste management - Causes, effects and control measures.

Role of an individual in preventing pollution.

UNIT-IV
Social Issues & Environment

From unsustainable to sustainable development, water conservation, rain water harvesting, watershed management, environmental ethics & issues, possible solutions, ozone layer depletion, global warming, consumerism & waste products.

Environment protection acts: Air (Prevention and Control of Pollution) Act – Water (Prevention and Control of Pollution) Act - Wild life Protection Act- Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness.

TEXT BOOKS:

1 Text book of Environmental Studies for Undergraduate Courses by Erach.Bharucha for University Grants Commission, Universities Press.
2 Environmental Studies by R. Rajagopalan, Oxford University Press.
3 Environmental Studies by Benny Joseph, Mc. Graw Hill Publications.

REFERENCE BOOKS:

1 Kaushik A, Kaushik C.P, Perspectives in Environmental Studies, 3rd ed., New International Publishers.
2 Text book of Environmental Sciences and Technology by M.Anji Reddy, BS Publication.
3 Environmental Studies by Anindita Basak-Pearson education.
4 Comprehensive Environmental Studies by J P Sharma, Laxmi Publications.

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B.Tech 2nd Semester – ECE	L	T	P	Oth	C
	3	1	0	0	3

16EE1202   **CIRCUIT THEORY**

COURSE OUTCOMES:
At the end of the course students able to

1   Explain the notation and components of electric circuits.
2   Analyze DC and single phase AC circuits using different methods and theorems.
3   Explain series and parallel resonance and their applications.
4   Draw current locus diagrams.

UNIT-I

Introduction to Electrical Circuits: Circuit Concept – R-L-C parameters – Voltage and Current sources -Independent and dependent sources- Source transformation – Voltage – Current relationship for passive elements (for different input signals-square, ramp, saw tooth, triangular).
Magnetic Circuits: 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

Network Analysis: Kirchhoff's laws – network reduction techniques – series, parallel, series-parallel. Star-to-delta and delta-to-star transformation. Nodal Analysis, mesh analysis, super node and super mesh for D.C excitations.
Single Phase AC Circuits: R.M.S and Average values and form factor for different periodic wave forms-sinusoidal, square, ramp, saw tooth etc., Phase and phase difference- Complex and Polar forms of representation - J-notation –Steady-state analysis of R, L and C (in series, parallel and series-parallel combinations) with sinusoidal excitation. Concepts of Reactance, Impedance, Susceptance, Admittance, power factor, Apparent, Real & Reactive power, Complex power. Phasor diagrams and analysis.

UNIT-III

Network Theorems - I: Superposition, Thevenin's, Norton's and Reciprocity theorems. Analysis with D.C. & sinusoidal excitations.
Network Theorems - II: compensation, maximum power transfer, Tellegen's, millman's theorems. Analysis with D.C. & Sinusoidal excitations.

UNIT-IV

Locus Diagrams & Resonance: Locus diagrams – series R-L, R-C, R-L-C combination with variation of R, L & C parameters. Resonance – series, parallel circuits, concept of band width and Q-factor.

Network Topology: Definition & Concepts: Graph – Tree, Basic cutset and Basic Tieset matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent and independent voltage and current sources - Duality & Dual networks.

TEXT BOOKS:

1 Allan R. Hambley, Electrical Engineering Principles and Applications, 3E, PHI, New Delhi.

2 W.H.Hayt, J.E.kemmerly and S.M.Durbin, Engineering Circuit Analysis, 6th Edition, Tata McGraw-Hill, New Delhi, 2006.

3 A.Sudhakar and P.Shyam Mohan, Circuits and Networks Analysis and Synthesis, 2nd Edition, Basic Electrical Engineering, Tata McGraw-Hill, New Delhi, 2004.

REFERENCE BOOKS:

1 Joseph A. Edminister., Theory and Problems of Electric Circuits, Schaum's Outline Series, McGraw Hill Book Company, 5th Edition, 1994.

2 A.Chakrabarti. Circuit Theory (Analysis and Synthesis), 5th Edition, Dhanpat Rai& Co. Delhi, 2008.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

B.Tech 2ⁿᵈ Semester – ECE

L	T	P	Oth	C
0	0	3	0	2

16HS2106   **PROFESSIONAL ENGLISH LAB**

COURSE OUTCOMES:

At the end of the course students able to

1 Gained practical knowledge in English Speech Sounds.
2 Develop ability on various language functions to fulfill the purpose of speaking and writing in academic and professional context.
3 Communicate effectively in different formal and informal situations.
4 Demonstrate various language functions.

UNIT-I

Phonetics: Vowels, Diphthongs and Consonants, Received Pronunciation, Transcription.

UNIT-II

Stress (Word Stress & Sentence Stress), Intonation, Listening to various accents. Just A Minute (Prepared & Extempore) & Situational Dialogues.

UNIT-III

Listening to Telephone Conversations and Telephone Etiquette.

UNIT-IV

Effective Group Discussion, Strategies for developing G.D. content, Maintaining direction, effective conclusion, -- towards consensus- Audio and video lesions for exposure to and comprehension of spoken English.

TEXT BOOKS:

1 R. K. Bansal and J. B. Harrison, Spoken English, Orient Longman 2006 Edn.
2 Krishna Mohan & NP Singh, Speaking English Effectively, (Macmillan).
3 J. Sethi, KamleshSadanand& D.V. Jindal, A Practical Course in English Pronunciation, (with two Audio cassettes), Prentice-Hall of India Pvt. Ltd., New Delhi.

REFERENCE BOOKS:

1 Daniel Jones, English Pronouncing Dictionary, Current Edition with CD.
2 Dr ShaliniVerma , Body Language- Your Success Mantra , S.Chand & Co, 2008
3 English Dictionary for Advanced Learners, (with CD) International edn. Macmillan 2009.

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B.Tech 2ⁿᵈ Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	0	0	3	0	2

16HS2107   **APPLIED PHYSICS LAB**

COURSE OUTCOMES:

At the end of the course students able to

1	Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations.
2	Develop procedures and observational skills as data is taken and gain a fundamental understanding of simple and complex apparatus used in the experiment.
3	Apply physics concepts to the research and development of new or improved technologies.
4	Students will learn how to effectively work in a team environment when solving Engineering Physics related problems.
5	Obtain and analyze scientific data from laboratory or field instruments.

LIST OF EXPERIMENTS

S.No	**Name of the Experiment**
1	Determination of radius of curvature of Plano convex lens- Newton's rings.
2	Dispersive power of the prism-Spectrometer.
3	Determination of wavelength of Spectral line of mercury spectrum using Diffraction grating -Normal Incidence.
4	Determination of wave length of a laser source-Diffraction grating.
5	Determination of particle size by using laser source.
6	Numerical Aperture of an optical fiber.
7	Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
8	Determination of Energy gap of a material of a p-n junction.
9	Determination of Rigidity modulus of a wire material-Torsional pendulum.
10	Determination of thickness of a thin wire by using parallel fringes.
11	Determination of frequency of an electrically vibrating tuning fork- Melde's method.
12	Determination of Planck's Constant.
13	Determination of Hall Coefficient of semi conductor.

TEXT BOOKS:

1	Manual cum Record for Engineering Physics Lab-1&2, by Prof. Sri M. Rama Rao, Acme Learning.
2	Physics lab Manual-Department of H&S, ASCET (Autonomous).

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

B.Tech 2nd Semester – ECE

L	T	P	Oth	C
0	0	3	0	2

16ME2104   ENGINEERING WORKSHOP AND IT WORKSHOP

COURSE OUTCOMES:

At the end of the course students able to

1 Utilize workshop tools for engineering practice
2 Analyze and find out suitable method of fabrication of a given simple component.
3 Employ skills acquired to provide quick fixes for routine domestic and/or industrial problems.
4 Appreciate the hard work and intuitive knowledge of the manual workers.

Trades for Exercises

A   Carpentry Shop
1 Cross Lap Joint
2 Mortise and Tenon Joint

B   Fitting Shop
1 Square Fitting
2 V- Fitting

C   Sheet Metal Shop
1 3-Sided Tray (Trapezoidal Tray)
2 Cylinder (Circular Tin)

D   House Wiring
1 Wiring for two lamps (bulbs) with independent switch controls with or without looping
2 Wiring for stair case lamp

E   Foundry
1 Single Piece Pattern
2 Double Piece Pattern

F   Welding
1 Lap Joint
2 T – Joint

Trades for Demonstration
1 Machine Shop (Lathe Machine, Grinding Machine and Drilling Machine)
2 Metal Cutting
3 Plumbing

EFERENCE BOOKS:

1 Engineering Work shop practice, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2 Work shop Manual, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3 Workshop Practice Manual, K. Venkata Reddy, BS Publications

IT WORKSHOP

COURSE OUTCOMES:

At the end of the course students able to
1   Understand the need of PC Hardware, internet & World Wide Web and office suites
2   Learn how to install different softwares
3   Install and use different software like Windows XP, Linux, and MSOffice suite component
4   Understand the troubleshooting techniques

LIST OF EXPERIMENTS:

PC Hardware:

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

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

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

Exercise 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

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

Exercise 6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web:

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

Exercise 8: Search Engines & Netiquette: Students should know what search engines are

and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

MS Word:

Exercise 9&10: The mentor needs to give an overview of Microsoft (MS) word 2007: Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word. Give a task covering to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Inserting table, using Drawing toolbar in word.

MS Excel:

Exercise 11&12: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool covering Accessing, overview of toolbars, saving excel files, Using help and resources., Also give a task that is covering the features like Gridlines, Format Cells, Summation, auto fill, Formatting Text.

MS Power Point:

Exercise 13&14: Students will be working on MS power point that helps them create basic power point presentation. Topics covered during this Exercise include :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students shall be given a model power point presentation which needs to be replicated (exactly how it's asked).

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B.Tech 3rd Semester – ECE

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16HS1301   **COMPLEX ANALYSIS**

COURSE OUTCOMES:
At the end of the course students able to

1. Know the basic definitions and elementary functions of complex variables ; get the concept of C - R theorem and solve problems on complex differentiation related to potential functions using Milne – Thompson Method
2. Compare the real and complex functions and apply the techniques in complex function problems in transmission lines, control systems, signal processing, and electromagnetic field theory
3. Solve problems on complex integration
4. Solve problems on Laurent series – Residue theorem which is applicable in signal processing and communications.
5. Solve problems on bilinear transformation which is useful to convert analog transfer functions into digital transfer functions for digital system design in digital signal processing.

UNIT-I

Functions of a Complex Variable : Elementary functions – Exponential, trigonometric, and hyperbolic functions and their properties - General power Z^c(c is complex) - Principal values Definitions of Continuity, differentiability and analyticity - Cauchy – Riemann Equations in Cartesian and polar co-ordinates–Harmonic and Conjugate Harmonic function –Milne – Thomson method

UNIT-II

Complex Integration & Complex power Series
Complex Integration: Line Integral – Evaluation along a path and by Indefinite Integration – Cauchy's Integral theorem – Cauchy's integral formula
Complex power series: Radius of convergence – Taylor's and Laurent's series

UNIT-III

The calculus of Residues
Singular and Isolated singular points – polesof order 'm' – Essential singularity (Definitions only)

Evaluation of residues – Residue theorem – Evaluation of integrals of the type

(a) Improper real integral $\int_{-\alpha}^{\alpha} f(x)dx$ (b) $\int_{0}^{2\pi} f(\cos\theta,\sin\theta)d\theta$ (c) $\int_{-\alpha}^{\alpha} e^{imx} f(x)dx$.

UNIT-IV

Conformal Mapping

Basic transformations-translation, rotation, magnification and inversion-Bilinear transformations - Fixed points – Cross ratio – Determination of bilinear Transformation mapping three given points - Conformal Mapping – Special transformations e^z, z^2sinz and   cos z

TEXT BOOKS:

1 Higher Engineering Mathematics - B. S. Grewal – 42nd Edition - Khanna Publications
2 Engineering Mathematics (Vol – III) - T.K.V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.

REFERENCE BOOKS:

1 Complex Variables and Applications – 8th Edition - J. W. Brown & R. V. Churchill – McGraw Hill Education
2 A Text Book of Engineering Mathematics, B.V. Ramana - Tata McGraw Hill Publications
3 Complex Variables – 2nd Edition - Schaum Outline Series - McGraw Hill Companies
4 Advanced Engineering Mathematics – RK Jain & SRK Iyengar – 3rd edition – Narosa Book distributors pvt ltd

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(AUTONOMOUS)

B.Tech 3ʳᵈ Semester – ECE	**L**	**T**	**P**	**Oth**	**C**
	3	1	0	0	3

16EE1304   **ELECTRICAL TECHNOLOGY**

COURSE OUTCOMES:
At the end of the course students able to
1   To explain the notation and components of electric circuits.
2   To analyze DC and single phase AC circuits using different methods and theorems.
3   To explain series and parallel resonance and their applications.
4   To draw current locus diagrams when an element is changing.

UNIT-I

Introduction to Electrical Circuits: Circuit Concept – R-L-C parameters – Voltage and Current sources -Independent and dependent sources- Source transformation – Voltage – Current relationship for passive elements (for different input signals-square, ramp, saw tooth, triangular).
Magnetic Circuits: 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

Network Analysis: Kirchhoff's laws – network reduction techniques – series, parallel, series-parallel. Star-to-delta and delta-to-star transformation. Nodal Analysis, mesh analysis, super node and super mesh for D.C excitations.
Single Phase AC Circuits: R.M.S and Average values and form factor for different periodic wave forms-sinusoidal, square, ramp, saw tooth etc., Phase and phase difference- Complex and Polar forms of representation - J-notation –Steady-state analysis of R, L and C (in series, parallel and series-parallel combinations) with sinusoidal excitation. Concepts of Reactance, Impedance, Susceptance, Admittance, power factor, Apparent, Real & Reactive power, Complex power. Phasor diagrams and analysis.

UNIT-III

Network Theorems - I: Superposition, Thevenin's, Norton's and Reciprocity theorems. Analysis with D.C. & sinusoidal excitations.
Network Theorems - II: compensation, maximum power transfer, Tellegen's, millman's theorems. Analysis with D.C. & sinusoidal excitations.

UNIT-IV

Locus Diagrams & Resonance: Locus diagrams – series R-L, R-C, R-L-C combination with variation of R, L & C parameters. Resonance – series, parallel circuits, concept of band width

and Q-factor.

Network Topology: Definition & Concepts: Graph – Tree, Basic cutset and Basic Tie set matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent and independent voltage and current sources - Duality & Dual networks.

TEXT BOOKS:

1 Allan R. Hambley, Electrical Engineering Principles and Applications, 3E, PHI, New Delhi.
2 W.H.Hayt, J.E.kemmerly and S.M.Durbin, Engineering Circuit Analysis, 6th Edition, Tata McGraw-Hill, New Delhi, 2006.
3 A.Sudhakar and P.Shyam Mohan, Circuits and Networks Analysis and Synthesis, 2nd Edition, Basic Electrical Engineering, Tata McGraw-Hill, New Delhi, 2004.

REFERENCE BOOKS:

1 Joseph A. Edminister., Theory and Problems of Electric Circuits, Schaum's Outline Series, McGraw Hill Book Company, 5th Edition, 1994.
2 A.Chakrabarti., Circuit Theory (Analysis and Synthesis), 5th Edition, Dhanpat Rai & Co. Delhi, 2008.

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B.Tech 3ʳᵈ Semester – ECE

L	T	P	Oth	C
3	1	0	0	3

16EC1301   ELECTRONIC DEVICES AND CIRCUITS

COURSE OUTCOMES:

At the end of the course students able to

1 Acquire knowledge in the field of solid state materials.
2 Analyze the structure of different types of semiconductor crystal structures.
3 Know the intrinsic property of semiconductor materials.
4 Understand and Analyse the different types of diodes, operation and its characteristics
5 Design biasing circuits using diodes and transistors.
6 Analyze and design diode application circuits.

UNIT-I

Semiconductor Physics &P-N Junction Diode: Semiconductor Materials ,Intrinsic & Extrinsic Materials ,Doping Concentrations ,Continuity equation, Drift &diffusion velocity ,Hall effect, P-N junction Manufacturing types, diode equation, V-I characteristics ,Temperature dependence, Static & Dynamic resistance, Diode equivalent Circuit, Break down mechanism, Zener diode and its characteristic. Study of Photo Diode, Varactor diode, Schottky diode, LED, LASER diode and Tunnel diode.

UNIT-II

Rectifiers and Filters: P-N junction as rectifier ,Half wave ,Full wave (center tap, Bridge)rectifiers, Average current, RMS current, Rectifiers efficiency, Ripple factor ,Form Factor, Percentage of regulation, Peak inverse voltage, Problems on rectifiers.
Filters: Capacitor, Inductor Filters-section filter, π-Section filter, Problems on filters, Zener diode as voltage regulator.

UNIT-III

BJT, Transistor Biasing & Stabilization:
Transistor construction, Operation and Configurations, V-I Characteristics, Relation between Transistor Parameters(α,β,γ),Comparison between BJT Configurations ,Analysis of Q-points and Load Lines(AC,DC), Need for Biasing, Types of Biasing Techniques and their stabilization factors (I_{CEO},V_{BE}, β &S) , Thermal runaway ,Problems on Biasing , BJT as Switch and Amplifier.

UNIT-IV

Field Effect Transistor: Introduction to FET, Types of FETs, Construction, Operations and Characteristics of JFET and MOSFET, FET Configurations, Comparison of JFET &MOSFET, Comparision between BJT and FET. Biasing of JFET and MOSFET, Problems on biasing. Principal of operation and Characteristics of UJT.

TEXT BOOKS:

1   Jacob Millman, Christos C Halkias & Satyabratajit, Electronic Devices and   Circuits, TMH, 2nd edition, 2008.
2   Robert L Boylested and Louis Nashelsky, Electronic Devices and Circuit Theory, Pearson India, 9th edition, 2007.
3   David A Bell, Electronic Devices and Circuits, Oxford, 5th Edition, 2008.
4   D Sasi kala & S Poorna Chandra, Electronic Devices And Circuits, Scitech publications, 4th Edition, 2008

REFERENCE BOOKS:

1   NN Bhargava, DC Kulshrestha and SC Gupta , Basic Electronics and Linear Circuits, TMH, 1 edition 2003.
2   Millman and Grabel , Microelectronics, Tata McGraw Hill, 2 edition**,** 1988.
3   G S N Raju, "Electronic Devices and Circuits", I K international Publishing House Pvt.Ltd., 2006.
4   Robert T Paynter, Introductory Electronic Devices and Circuits, Pearson, 7th Edition,2008.

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16EC1302   PROBABILITY THEORY AND STOCHASTIC PROCESS

COURSE OUTCOMES:

At the end of the course students able to

1   Understand the basics of probability, events and random experiments.
2   Understand the mathematical concepts related to probability theory and random processes.
3   Understand the multiple random variables and relate through examples to real problems.
4   Analyze the Operations on Multiple Random Variables & Stochastic Process.
5   Understand the characterization of random processes and their properties.
6   Formulate and solve the engineering problems involving random processes.

UNIT-I

Probability & The random Variable:

Probability introduced through sets and Relative Frequency: Experiments and Sample Spaces Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes' Theorem and Independent Events.

Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variable, Distribution and Density functions and their Properties- Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh and Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties.

UNIT-II

Operation on One Random Variable & Multiple Random variables:

Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Nonmonotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable.

Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density– Point Conditioning, Conditional Distribution and Density–Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem (Proof not expected), Unequal and Equal Distributions.

UNIT-III

Operations on Multiple Random Variables & Stochastic Process:
Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.
Concept of Stochastic Process, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationary and Statistical Independence, First-Order Stationary Processes, Second- Order and Wide- Sense Stationarity, Nth- Order and Strict- Sense Stationarity.

UNIT-IV

Temporal Characteristics & Special Characteristics:
Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and its Properties, Cross- Correlation Function and its Properties, Covariance and its Properties, Linear system Response of Mean and Mean- Squared value, Autocorrelation Function, Cross-Correlation Functions, Gaussian Random processes and Poisson Random Process.
Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross- Power Density Spectrum, Properties. Relationship between Cross- Power Spectrum and Cross- Correlation Function, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross- Power Spectral Density of Input and Output of a Linear System.

TEXT BOOKS:
1 Peyton Z. Peebles Jr., Probability, Random Variables and Random Signal Principles, 4th Edition, TMH,2002.
2 Athanasios Papoulis and S.Unnikrishna Pillai,Probability, Random Variables and Stochastic Processes, 4th Edition, TMH, 2002.
3 Pradip Kumar Ghosh, Theory of Probability and Stochastic Processes , 1st edition, Universities Press, 2010.
4 H.Taub. Donald. L.Schilling, Goutam Saha, Principles of Communication Systems , 3rd edition TMH, 2008.

REFERENCE BOOKS:
1 Mallikarjuna Reddy, Probability Theory and Stochastic Processes, 1st edition , Cengage Learning,2010.
2 John W Woods, Henry Stark, Probability and Random Processes with Application to Signal Processing, , 3rd Edition Pearson Education, 2011.
3 George R. Cooper, Clare D.Mc Gillem ,Probability Methods of Signal and System Analysis, 3rd Edition,Oxford, 1999.
4 S.P.Eugene Xavier , Statistical Theory of Communication, 1st edition, New Age Publications, 2003.

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16EC1303   **SIGNALS AND SYSTEMS**

COURSE OUTCOMES:

At the end of the course students able to

1. Represent any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function etc.,
2. Express periodic signals in terms of Fourier series and express the spectrum and express the arbitrary signal (discrete) as Fourier transform to draw the spectrum.
3. Understand the principle of linear system, filter characteristics of a system and its bandwidth, the concepts of auto correlation and cross correlation and power Density Spectrum.
4. Can design a system for sampling a signal.
5. For a given system, response can be obtained using Laplace transform, properties and ROC of L.T.
6. Study the continuous and discrete signal relation and relation between F.T., L.T. & Z.T, properties, ROC of Z Transform

UNIT-I

Introduction to Signals, Fourier Series:

Analogy between vectors and signals, orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, closed or complete set of orthogonal functions, Orthogonality in complex functions. Representation of function by a set of mutually orthogonal functions. Classification of signals, elementary signals, basic operations on signals, classification of systems, basic system properties

Fourier series representation of Continuous-time periodic signals, Convergence of the Fourier Series, Properties of Continuous time Fourier Series, the complex Fourier spectrum

UNIT-II

Continuous time Fourier transform: Deriving Fourier transform from Fourier series, Convergence of Fourier transform, The Continuous-time Fourier Transform, Fourier transforms of standard signals, Fourier transform for periodic signals, Properties of the continuous time Fourier transform, Hilbert transform.

Linear time invariant systems: impulse response, input-output relation for a linear system, transfer function of an LTI system, filter characteristics of a linear system, distortionless transmission through a system, signal and system bandwidth, ideal filter characteristics, causality and Paley-Wiener criterion for physical realization

UNIT-III

Sampling theorem for band-limited signals, types of sampling, Reconstruction of signals from its samples, effect of undersampling- Aliasing, Introduction to band pass sampling.

Convolution & Correlation: Convolution and Correlation, graphical analysis of convolution, autocorrelation and cross correlation, energy density spectrum, Parseval's theorem, power density spectrum, relation between autocorrelation and spectral density function, relation between convolution and correlation.

UNIT-IV

Laplace transforms: Review of Laplace transforms, Concept of region of convergence (ROC) for Laplace transforms, Inverse Laplace transform, Properties of Laplace transform, constraints on ROC for various classes of signals, Relation between Laplace transform, and Fourier transform of a signal,

Analysis and characterization of LTI System, System function algebra and block diagram representation, Unilateral Laplace transform.

Z–Transforms: Introduction, The Z-transform, The region of convergence for the Z- transform, The Inverse Z-transform: Properties of Z-transform, Analysis and characterization of LTI systems using Z-transforms, Unilateral Z-Transform.

TEXT BOOKS:

1 A.V. Oppenheim, A.S. Willsky and S.H. Nawab , Signals and Systems, PHI, 2nd Edition, 2009.
2 Simon Haykin and Van Veen ,Signals & Systems, Wiley, 2nd Edition, 2007.
3 B.P. Lathi, Signals, Systems & Communications, BS Publications, 1 edition 2008.

REFERENCE BOOKS:

1 Michel J. Robert , Fundamentals of Signals and Systems, MGH International Edition, 2008.
2 M.J.Roberts , Signals and Systems Analysis using Transform method and MATLAB , TMH, 1st edition, 2007.

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16EC1304   **SWITCHING THEORY AND LOGIC DESIGN**

COURSE OUTCOMES:

At the end of the course students able to

1 Manipulate numeric information in different bases, Simple Boolean expressions and can minimize combinational functions.
2 Realize logic methods to design digital circuits.
3 Design and analyse small combinational circuits and to use standard combinational functions /building blocks to build larger more complex circuits.
4 Analyze and design small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits.
5 Student will learn Design of ASM and FSM.

UNIT-I

Digital Codes and Boolean Algebraic Switching Functions:

Types of number systems – complement representation of Negative numbers, Implementation of simple arithmetic operations and conversions using Binary, BCD, OCTAL and Hexa-Decimal Numbers, Error Detecting & Error Correcting codes - Hamming codes, Fundamental postulates of Boolean Algebra, Basic theorems and properties, Switching Functions, Canonical and Standard forms, Algebraic simplification, Digital Logic Gates, Universal Gates.

UNIT-II

Minimization of Switching Functions and Combinational Logic Design:

Map Method - Prime Implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, Simplification Rules, Design using conventional Logic Gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Introduction to Modular design using IC chips,
MUX Realization of switching functions Parity bit generator, Code-converters, Hazards and hazard free realizations.

UNIT-III

Programmable Logic Devices and Sequential Circuits:

Basic PLD's-ROM, PROM, PAL, PLA. Realization of Switching functions using PLD's, Capabilities and limitations of Threshold gate, Classification of sequential circuits: (Synchronous, Asynchronous, Pulse mode, Level mode with examples) Basic Flip-Flops, Triggering and Excitation Tables, Steps in Synchronous Sequential Circuit Design, Design of modulo-N Ring & Shift counters, Serial Binary Adder, Sequence Detector and Memory (Register level: Serial and Parallel).

UNIT-IV

State Machines: FSMs AND ASMs

Finite State Machine – capabilities and Limitations, Mealy and Moore models, Examples of Mealy and Moore models, Partition Techniques and Merger chart Methods Concept of Minimal cover table.

Algorithmic State Machines:-Salient features of the ASM chart, Simple examples, System design using data path and control subsystems, control Implementations, Examples of Weighing machine and Binary multiplier.

TEXT BOOKS:

1 Zvi Kohavi, Switching & Finite Automata theory, TMH, 2nd Edition, 1979.
2 Morris Mano, Digital Design, PHI, 3rd Edition, 2008.
3 A.Anand Kumar, Switching Theory and Logic Design, PHI, 1st Edition, 2011.
4 R.P.Jain, "Modern Digital Electronics", 4th Edition, TMH.

REFERENCE BOOKS:

1 Fletcher, An Engineering Approach to Digital Design, PHI. 1st Edition 2001.
2 Charles H. Roth, Fundamentals of logic design, Thomson Publicaitons, 5th Edition 2006.
3 Donald D Givone, "Digital Principles and Design", TMH, 1st Edition.

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	0	**0**	**3**	**0**	**2**

16EE2306   **ELECTRICAL TECHNOLOGY LAB**

COURSE OUTCOMES:

At the end of the course students able to

1 Apply the fundamental laws to the design and analysis of circuits.
2 Analyze linear electrical circuits using the modified nodal, mesh analysis and network theorems.
3 Test D.C Machines using different techniques.
4 Test A.C Machines using different techniques.

List of Experiments:

PART-A

1. Verification of KVL and KCL.
2. Verification of Thevenin`s Equivalent circuit and Norton`s Equivalent circuit.
3. Verification of Superposition and Reciprocity theorems.
4. Verification of Tellegen`s and millman's theorems.
5. Verification of Maximum power transfer theorem. Verification on DC, Verification on AC with Resistive loads.
6. Verification of Compensation theorem.
7. Two Port Network parameters- Z and Y parameters.
8. Two Port Network parameters- ABCD and h-parameters.

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0	0	3	0	2

16EC2305   ELECTRONIC DEVICES AND CIRCUITS LAB

COURSE OUTCOMES:

At the end of the course students able to

1   Measure voltage, frequency and phase of any waveform using CRO.
2   Generate sine, square and triangular waveforms with required frequency and amplitude using function generator.
3   Lean the operation of Components & instruments used.
4   Analyze the characteristics of different electronic devices such as diodes, transistors etc., and simple circuits like rectifiers & regulators etc.
5   Analyze the characteristics of UJT.

List of Experiments:

1. PN Junction diode characteristics
2. Zener diode characteristics
3. Half wave rectifier with and without filter
4. Full wave rectifier with and without filter.
5. characteristics of CB Configuration
6. characteristics of CE Configuration
7. FET characteristics
8. Design of self bias for BJT.
9. Design of Zener regulator.
10. UJT characteristics
11. LED Characteristics.
12. Characteristics of Photo Diode.
13. Design of Self bias for FET.

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16EC2306   **SIGNALS AND SYSTEMS LAB**

COURSE OUTCOMES:

At the end of the course students able to

1. Analyze the generation of various signals and sequences such as unit impulse, unit step, square, saw tooth, Triangular, sinusoidal, Ramp, Sinc.
2. Understanding of convolution between signals and sequences.
3. Understand Gibbs Phenomenon.
4. Verify Linearity and Time Invariance properties of given continuous/Discrete systems.
5. Find the Fourier transform of a given signal and plot its magnitude and phase spectrum & Sampling theorem verification.
6. Understand Autocorrelation and cross correlation between signals and sequences.

List of Experiments:

1. Write a program to generate the discrete sequences (i) unit step (ii) unit impulse (iii) ramp (iv) periodic sinusoidal sequences. Plot all the sequences.
2. Find the Fourier transform of a square pulse .Plot its amplitude and phase spectrum.
3. Write a program to convolve two discrete time sequences. Plot all the sequences. Verify the result by analytical calculation.
4. Write a program to find the trigonometric Fourier series coefficients of a rectangular periodic signal. Reconstruct the signal by combining the Fourier series coefficients with appropriate weightings.
5. Write a program to find the trigonometric and exponential fourier series coefficients of a periodic rectangular signal. Plot the discrete spectrum of the signal.
6. Generate a discrete time sequence by sampling a continuous time signal. Show that with sampling rates less than Nyquist rate, aliasing occurs while reconstructing the signal.
7. The signal x (t) is defined as below. The signal is sampled at a sampling rate of 1000 samples per second. Find the power content and power spectral density for any signal.
8. Write a program to find the magnitude and phase response of first order low pass and high pass filter. Plot the responses in logarithmic scale.
9. Write a program to find the response of a low pass filter and high pass filter, when a speech signal is passed through these filters.
10. Write a program to find the autocorrelation and cross correlation of sequences.
11. Generate a uniformly distributed length 1000 random sequence in the range (0,1). Plot the histogram and the probability function for the sequence. Compute the mean and variance of the random signal.
12. Generate a Gaussian distributed length 1000 random sequence. Compute the mean and variance of the random signal by a suitable method.
13. Write a program to generate a random sinusoidal signal and plot four possible realizations of the random signal.

14. Generate a discrete time sequence of N=1000 i.i.d uniformly distributed random numbers in the interval (-0.5,-0.5) and compute the autocorrelation of the sequence.

15. Obtain and plot the power spectrum of the output process when a white random process is passed through a filter with specific impulse response.

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	0	**0**	**0**	**3**	**1**

16AS3301   **COMMUNICATION SKILLS PRACTICE**

COURSE OUTCOMES:

At the end of the course students able to

1   In this strand, students develop learning and thinking skills and strategies to become self-directed, lifelong learners.

2   They discover how to manage their own learning and acquire knowledge and skills that they can transfer to a variety of situations related to learning, work, and daily life.

- **Development of Proficiency in Concepts of effective communication:**

Practice on Oral and spoken communication skill & testing– Communication process and voice & accent, voice clarity, handling them voice modulation & intonation,
KISS (Keep it short and sweet) in word stress etc.
Composing Feedback and questioning effective messages.
Non–Verbal Communication: Objectiveness in Argument its importance and nuances:
Development etiquettes and Facial Expression,
Posture, manners Gesture , Eye contact, appearance Study of different pictorial (dress code).

- **Art of Speaking**

Introduction – What makes communication important? – Defining communication – special feature of communication – communication process – channels of communication – Formal communications network – Informal communications network (Grapevine Communication) – Importance of Communication – Barriers to communication – Tips for effective communication – conversation tips – what is presentation? – Tips for powerful presentation – Art of public speaking – Importance of public speaking – Benefits of public speaking – Public speaking tips – overcoming fear of public speaking.
Activity : Conservation; Presentation; Pubic Speaking

- **Art of Writing**

Introduction – Importance of Writing – Writing tips – Drawbacks of written communications.

- **Art of Writing E-Mail**

Introduction – The Mail Magic – use appropriate salutations – Make the subject matter significant – keep a dictionary close by – use commas – use smileys – when I doubt, preface – include previous message – shorten the file attachments – Reread before pressing 'Send' button – Be polite, and reciprocate good deeds – Anticipate, empathize, understand – what netiquette?

- **Etiquette and Manners**

Etiquette

Introduction – Modern etiquette – Benefits of etiquette – classification of etiquette – accompanying women – Taboo topics – proposing the toast.

Manners

Introduction – Poor Manners noticed in youth – why should you practice good manners ? – Practicing good manners – Manners at the wheel driving – Manners in the flight – Respecting the sacred – visiting holy places – Dealing with the challenged – Attending the funeral – Professional

manners – social skills (manners) – getting along with people – Manners to get respect from others – To sum up : corporate grooming tips – Mind your mobile manners – Annoying office habits.
Activity : 1. Test your Etiquette; 2. Test your Manners

- **<u>Preparing CV / Resume</u>**

Introduction – Meaning – Differences among Bio-data, CV and Resume – The terms – The purpose of CV writing – Types of Resumes – Interesting facts about Resumes – CV writing tips – CV/Resume preparation – the do's – Resume checkup – Electronic Resume tips – References – Power words – Common Resume builders – Key skills that can be mentioned in the Resume – Cover letters – Cover letter tips
Expression of non-verbal communication and its analysis

- **Written Communication Skill**:
    Practice for:
    - Correction of errors
    - Making of Sentences
    - Paragraph Writing
    - Leave Application and simple letter writing

- **Presentation Skill practice**
    - Preparing in presentation
    - Delivery of presentation
- **Telecommunication Skills**
    - Tele – etiquette
    - Receiving Calls
    - Transferring calls
    - Taking Message/ Voice Mails
    - Making Outgoing Calls
- **<u>Computer and Internet operational</u>**
    - Key boarding skills
    - Practice on computer using MS office XP
    - Practice on sending & receiving e-mail

REFERENCE BOOKS:
1 Soft skills Training – A workbook to develop ski lls for employment by Fredrick H. Wentz
2 Personality Development and Soft skills, Oxford University Press by Barun K. Mitra 3. The Time Trap : the Classic book on Time Management by R. Alec Mackenzine

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16AS3302   PROFESSIONAL SOCIETY ACTIVITIES-I

Professional Society Activities (PSA) course is aimed at enhancing the self learning, communication, managerial skills of the students by engaging them in various Co & Extra Curricular activities activities during their course of study. Activities in each of the department shall be designed and conducted by the Professional Society Executive Committee whose composition is:

1. Faculty Mentors- 2 No.

2. Student Chairman: 1 No.- Final year Student

3. Student General Secretary: 1 No.- Third year Student

4. Treasurer: 1 No.- Third year Student

Student Members: 2 No.s from each class

PSA related activities would be of the following nature but not limited to:

Activity#0   : Constitution of Student Body at respective departments & Inaugural

Function

Activity#1   : Just A Minute

Activity#2   : Technical Quiz

Activity#3   : Open House- Lab Demo

Activity#4   : Technical Paper Presentation- Preliminary

Activity#5   : Technical Paper Presentation- Final

Activity#6   : Poster Presentation

Activity#7   : Collage- A theme based event

Activity#8   : Debate Competition

Activity#9   : Group Discussion Competition

Activity#10   : Mock Interviews

Activity#11   : Model Exhibition

Activity#12 : Valedictory Function

> **Composition of Professional Society Executive Committee**:
> 1. Faculty Mentors- 2 No.
> 2. Student Chairman: 1 No.- Final year Student
> 3. Student General Secretary: 1 No.- Third year Student
> 4. Treasurer: 1 No.- Third year Student
> 5. Student Members: 2 No.s from each class

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16HS1401   **MATRICES AND NUMERICAL METHODS**

COURSE OUTCOMES:

At the end of the course students able to

1. Compute the rank of matrices ; solve the linear system of equations (homogeneous as well as non – homogeneous)
2. Calculate the eigen values and eigenvectors of the matrices ; understand the complex matrix properties
3. Solve problems using Cayley – Hamilton theorem ; reduce the given matrices into diagonal form ; reduce the matrices into canonical form by orthogonal transformation
4. Solve exercises by N-R method ; get to know the concept of finite differences and apply to various engineering problems
5. Analyze problems using Trapezoidal and Simpson's 1/3rules ; solve first order ODEs using Euler's and R- K methods of 2ⁿᵈ and 4ᵗʰ order
6. Gain the knowledge of vector differentiation and solve the problems of various engineering problems

UNIT-I :

Matrices

Rank by Echelon and normal forms – Solution of system of linear equations – Eigenvalues and Eigenvectors - Cayley- Hamilton theorem (without proof) and its applications-Reduction to diagonal form – Quadratic forms – Reduction of Quadratic form to canonical form by orthogonal transformation and their nature

UNIT-II :

Solutions of algebraic and transcendental equations

Solutions of algebraic and transcendental equations by Bisection, Regula – Falsi and Newton – Raphson Method - System of linear equations – Gauss elimination - LU decomposition Gauss – Seidel Iteration Method

UNIT-III :

NTERP0LATION & CURVE FITTING

Newton's forward and backward interpolation formulae - Relations between difference operators – Lagrange's interpolation
Least squares curve fitting –fitting a straight line –non-linear curve fitting –Parabolic, Exponential and power function

UNIT-IV :

Numerical Differentiation &Integration and Differential Equations

Formulae for derivatives - Numerical integration using Trapezoidal and Simpson's 1/3rules - Numerical solutions of first order ODEs – Euler's, Runge - Kutta methods of 2ⁿᵈ and 4ᵗʰ orders – Milne's Predictor – Corrector Method

TEXT BOOKS:

1   Higher Engineering Mathematics, Dr. B.S. Grewal – 42nd Edition - Khanna Publications
2   E.Rukmangadachari& E. Keshava Reddy ,Engineering Mathematics , Volume-I&II, 2nd Edition-Pearson publishers

REFERENCE BOOKS:

1   Introduction to Numerical Analysis – S. S. Sastry – Prentice Hall of India
2   Advanced Engineering Mathematics – E. Kreyzig – 10th Edition – Wiley Publications
3   A Text Book of Engineering Mathematics – I - T.K.V. Iyengar, B. Krishna Gandhi and Others - S. Chand & Company – Revised edition 2013
4   A Text Book of Engineering Mathematics, B.V. Ramana - Tata McGraw Hill Publications

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16CS1407   **DATA STRUCTURES THROUGH 'C'**

COURSE OUTCOMES:
At the end of the course students able to
1. Apply Concepts of Stacks, Queues, Linked Lists
2. Develop Programs For Searching And Sorting, Trees.
3. Interpret concepts of trees.
4. Choose searching algorithms.
5. Develop programs for Sorting and Searching.

UNIT-I

Introduction to data structures, Types, Operations
Stacks: Introduction, Stack Operations, Applications.
Queues: Introduction, Operations on queues, Circular queues, Priority queues & Applications.

UNIT-II

Linked lists: Introduction, Singly linked lists, Circular linked lists, Doubly linked lists, Multiply linked lists, Applications.
Implementation of Stack and Queue using linked list.

UNIT-III

Sorting: Introduction, Selection sort, Bubble sort, Insertion sort, Merge sort, Quick sort, Heap Sort.
Searching: Introduction, Linear search, Binary search, Fibonacci search.
Trees: Introduction, Definition and basic terminologies, Representation of trees.

UNIT-IV

Binary Trees: basic terminologies and types, binary tree traversals, applications. Binary search trees, AVL trees, Red-Black Trees, splay trees.

TEXT BOOKS:

1. G.A.V PAI, Data Structures and Algorithms, Concepts, Techniques and Applications, Volume1, 1stEdition, Tata McGraw-Hill, 2008.
2. Richard F. Gilberg & Behrouz A. Forouzan, Data Structures, Pseudo code Approach with C, 2ndEdition, Cengage Learning India Edition, 2007.

REFERENCE BOOKS:

1   Langsam, M. J. Augenstein, A. M. Tanenbaum, Datastructures using C and C++, 2nd Edition, PHI Education, 2008.
2   Sartaj Sahni, Ellis Horowitz, Fundamentals of at a Structures in C, 2nd Edition, Orientblackswan, 2010.

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16EC1401   **ANALOG CIRCUIT ANALYSIS**

COURSE OUTCOMES:

At the end of the course students able to

1 Analyze Single stage amplifier at low and High frequencies using BJT and FETs.
2 Analyze Multi stage amplifiers at low and High frequencies using BJT and FETs.
3 Analyze single stage and multi stage amplifiers and to enable the students to realize the impact of cascading or coupling during the system level integration.
4 Recognize the importance of feedback in amplifiers.
5 Understand the principle, operation and design of oscillators.
6 Comprehend the use of Power amplifiers and Tuned amplifiers in real time applications.

UNIT-I

Small Signal Amplifiers:

Common emitter amplifier with emitter resistance, Emitter follower, FET small signal model, Low frequency common source and common drain amplifiers, FET as Voltage Variable Resistor, Cascading Transistor Amplifiers, High input Resistance Transistor Circuits – Darlington pair, Cascode amplifier, Frequency response and analysis of RC Coupling, Direct coupling and Transformer coupling, Difference amplifier, Two Stage RC Coupled JFET amplifiers (in Common Source (CS) configuration). Transistor at High Frequencies, Hybrid- π Common Emitter transistor model, Hybrid- π conductances, Hybrid π capacitances, Validity of hybrid π model, Variation of Hybrid Parameters, CE short circuit gain, Current gain with resistive load, Single stage CE transistor amplifier response, Gain Bandwidth product, Emitter follower at High frequencies.

UNIT-II

Large Signal Amplifiers:

Classification of amplifiers, Class A large signal amplifiers, second harmonic distortion, higher order harmonic distortion, transformer-coupled class A audio power amplifier – efficiency of Class A amplifiers. Class B amplifier – efficiency – push pull amplifier - distortion in amplifiers - complementary-symmetry (Class B) push-pull amplifier, Class C, Class D amplifier – Class S amplifier – MOSFET power amplifier, Thermal stability and heat sink.

UNIT-III

Feedback Amplifiers:

Block diagram, Loop gain, Gain with feedback, Effects of negative feedback – Sensitivity and desensitivity of gain, Cut-off frequencies, distortion, noise, input impedance and output impedance with feedback, Four types of negative feedback connections – voltage series feedback, voltage shunt feedback, current series feedback and current shunt feedback, Method

of identifying feedback topology and feedback factor, Nyquist criterion for stability of feedback amplifiers.

UNIT-IV

Oscillators:
Classification, Barkhausen Criterion - Mechanism for start of oscillation and stabilization of amplitude, General form of an Oscillator, Analysis of LC oscillators -Hartley, Colpitts, Clapp, Armstrong, Tuned collector oscillators, RC oscillators -phase shift – Wienbridge.

Tuned Amplifiers and Voltage Regulators:
Introduction, Q-Factor, Small Signal Tuned Amplifier – Capacitance single tuned amplifier, Double Tuned Amplifiers, Effect of Cascading Single tuned amplifiers on Band width, Effect of Cascading Double tuned amplifiers on Band width, Staggered tuned amplifiers, Stability of tuned amplifiers, Voltage regulation – Line Regulation, Load Regulation, Types of Regulators, Series voltage regulator , shunt regulators, Overload Voltage protection.

TEXT BOOKS:
 1 Jacob Millman, Christos C Halkias & Satyabratajit , Electronic Devices and   Circuits, TMH, 2nd edition 2007**.**
 2 Robert L Boylested and Louis Nashelsky, Electronic Devices and Circuit Theory, Pearson India, 10th Edition,2009.
 3 David A Bell , Electronic Devices and Circuits, Oxford, 5th edition, 2008.
 4 Floyd, Electronic Devices, Low Price Edition, 6th Edition, 2009

REFERENCE BOOKS:
 1 NN Bhargava, DC Kulshrestha and SC Gupta, Basic Electronics and Linear Circuits, TMH, 2nd edition, 2009.
 2 Jacob Millman and Arvin Grabel, Microelectronics, Tata McGraw Hill, 2nd edition, 2007.
 3 Robert T Paynter, Introductory Electronic Devices and Circuits, Pearson , 7th Edition, 2008.
 4 K Lal Kishore, Electronic Devices and Circuits, BS Publications, 3rd Edition, 2007.

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16EC1402   **PULSE AND DIGITAL CIRCUITS**

COURSE OUTCOMES:

At the end of the course students able to

1 Construct different linear networks like low pass circuits and high pass circuits and determine their response to different signals.
2 Determine how linear networks acts like integrator and differentiator and their voltage and band width formulae.
3 Construct non-linear networks and find the response of them to different input signals.
4 Determining the voltage and transfer characteristics of clipper and clamper circuits and also learn about comparators.
5 Determine the switching characteristics of diode.
6 Determine how to use synchronization and frequency division concept.

UNIT-I

Introduction to elementary signals and representations, RC circuits, types
Linear Wave Shaping:
The Highpass RC Circuit, The Highpass RC Circuit: Exponential & Ramp Inputs, The Highpass RC Circuit as a Diffentiator, Low pass RC Circuit, The Low pass RC Circuit (Exponential & Ramp Inputs), The Low Pass RC Circuit as a Integrator, Attenuators.
Non-Linear Wave Shaping:
Clipping Circuits, Diode Clippers, Clipping at Two Independent Levels, The Clamping Operation, Clamping Circuits Taking Source and Diode Resistances into Account, A Clamping Circuit Theorem and Practical Clamping Circuits.

UNIT-II

Multivibrators:
Bistable Multivibrator**:** The Stable States of a Bistable Multivibrator, A Fixed Bias Transistor Bistable Multivibrator, Self Bias Transistor Bistable Multivibrator, Commutating Capacitors, Methods of Improving Resolution, Unsymmetrical Triggering of the Bistable Multivibrator. Triggering Unsymmetrical through a Unilateral Device, Symmetrical Triggering and Schmitt Trigger.
Monostable And Astable Multivibrators**:** The Monostable Multivibrators, Gate Width of a Collector Coupled Monostable Multivibrator, Waveforms of The Collector Coupled Monostable Multivibrators, The Astable Collector Coupled Multivibrator**.**

UNIT-III

Time Base Generators:
Voltage Time Base Generators: General Features of a Time Base Signal, Methods of

Generating a Time Base Waveform, Exponential Sweep Circuit, Negative Resistance Switches, Sweep Circuit Using a Transistor Switch, A Transistor Constant Current Sweep, Miller and Boot Strap Time Base Generators-General Considerations, The Transistor Miller Time Base Generator, The Transistor Boot Strap Time Base Generator.

Current Time Base Generators: A Simple Current Sweep, Linearity Correction through Adjustment of Driving Waveform, A Transistor Current Time Base Generator. Blocking Oscillators: A Triggered Transistor Blocking Oscillator (Base Timing), A Triggered Transistor Blocking Oscillator (Emitter Timing).

UNIT-IV

Sampling Gates: basic operating principle, types & applications of S.G, synchronization and frequency division applications.

Logic Gates and Applications: OR, AND, NOT, NAND, NOR, EX-OR and EX-NOR gates, RTL, DTL,TTL and CMOS logic families

TEXT BOOKS:

1. J.Millman, H.Taub, Pulse, Digital and Switching Wave forms, TMH publishers,1st edition, 2001.
2. A.Anand Kumar, Pulse and Digital Circuits, PHI Publishers 2nd edition, 2008.
3. David A.Bell , Solid State Pulse Circuits, PHI, 4th edition, 2006.
4. Pulse,digital and switching wave forms,Jacob Millman, Second Edition, Tata McGraw-Hill,2008.

REFERENCE BOOKS:

1. L. strauss, Wave Generation and shaping , McGraw-Hill,1970.
2. Jacob Millman,Christos C.Halkis, Integrated Electronics, TMH, 2nd edition, 2009.
3. Ronald J.Tocci, Fundamentals of pulse and digital circuits, 3 rd edition 2008
4. John f. Wakerly, Digital design principles and practices, Pearson publishers,3rd edition 2011.

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16EC1403   ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

COURSE OUTCOMES:

At the end of the course students able to

1. Understand and implement the Maxwell's Equations.
2. Understand and analyze the Boundary conditions for different media, i.e. Dielectric to Dielectric, Dielectric to conductor interfaces.
3. Understand and analyze the various parameters and characteristics of the EM Waves
4. Understand how electromagnetic wave propagates.
5. Acquire knowledge about Reflection and refraction of plane waves.
6. Analyze basic transmission line parameters and usage of Smith chart.

UNIT-I

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

UNIT-II

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

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

UNIT-III

EM Wave Characteristics: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization, Direction Cosines. Reflection and Refraction of Plane Waves - Normal and Oblique

Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Poynting Vector and Poynting Theorem – Applications, Surface Impedance, Power Loss in a Plane Conductor, Illustrative Problems.

UNIT-IV

Transmission Lines: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Lossless / Low Loss Characterization, Distortion - Condition for Distortion less and Minimum Attenuation, Loading – Types of Loading. Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, UHF Lines as Circuit Elements, Smith Chart - Configuration and Applications, Impedance Matching- Quarter Wave Transformer, Single and Double Stub Matching, Illustrative problems.

TEXT BOOKS:

1 William H. Hayt Jr. and John A. Buck, Engineering Electromagnetic s, TMH, 7th edition 2006.
2 Mathew N.O. Sadiku , Elements of Electromagnetics, Oxford University Press, 4th edition 2007.
3 E.C. Jordan and K.G. Balmain, Electromagnetic Waves and Radiating Systems, PHI, 2nd edition 2008.
4 Umesh Sinha, Transmission Lines and Networks, Satyaprakashan (Tech India publications) 8th edition, 2009

REFERENCE BOOKS:

1 Nannapaneni Narayana Rao, Elements of Engineering Electromagneitics, PHI, 4th edition,2002
2 John D. Ryder , Networks, Lines and Fields, PHI, 2nd edition, 2000.
3 K.D. Prasad, Antenna & Wave Propagation, Tech India Publishers, 1st edition, 2001.
4 "Electromagnetics", Schaum's Outline Series, 3rd edition,2011.

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16EC1404　　　　COMPUTER ARCHITECTURE AND ORGANIZATION

COURSE OUTCOMES:

At the end of the course students able to

1　Learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design.
2　Identify how enhancements of computer performance can be accomplished.
3　Introduce to more recent applications of computer organization in advanced digital systems.
4　Applying the basic knowledge of design of digital logic circuits to computer organization.
5　Learn from additional topics in computer architectures such as multiprocessors pipeline and vector processing, shared memory and distributed multiprocessors.

UNIT-I

BASIC STRUCTURE OF COMPUTERS:
Computer Types,Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance of computer system.
REGISTER TRANSFER AND MICRO-OPERATIONS: Register Transfer Language,Register Transfer, Bus and Memory Transfer, Arithmetic, Logic,Shift Micro-operations, Arithmetic logic shift Unit, Instruction Codes, Computer Registers, Computer Instructions,Instruction Cycle,Memory Reference Instructions, Input – Output and Interrupt, STACK Organization,Instruction Formats, Addressing Modes, DATA Transfer and Manipulation, Program Control, Reduced Instruction Set Computer.

UNIT-II

MICRO PROGRAMMED CONTROL: Control Memory, Address Sequencing, Design of Control Unit- Hard Wired Control, Microprogrammed Control.
COMPUTER ARITHMETIC: Data Representation-Fixed point, Floating Point Representation, Addition, Subtraction,Multiplication,Division Algorithms, Floating – Point Arithmetic Operations, Decimal Arithmetic Unit, Decimal Arithmetic Operations.

UNIT-III

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM memories, Read-only memories, Cache memories, performance considerations, Virtual memories, secondary storage, Introduction to RAID.
INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Modes of Transfer, Priority Interrupt, Direct memory Access, Input –Output Processor (IOP), Serial communication, Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT-IV

ADVANCED ARCHITECTURES:
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, Interprocessor Communication and Synchronization, Shared Memory Multiprocessors, Distributed Multicomputing.

TEXT BOOKS:

1 Carl Hamacher, Zvonks Vranesic, SafeaZaky, "Computer Organization", 5th Edition , McGraw Hill,2002.
2 M.Moris Mano, "Computer Systems Architecture", Pearson/PHI, 3rd Edition,2009.
3 William Stallings,"Computer Organization and Architecture",6th Edition, Pearson/PHI,2009.
4 B. Parhami, "Computer Architecture: From Microprocessors to Supercomputers", Oxford univ, Press, New York, 2005.

REFERENCE BOOKS:

1 Andrew S. Tanenbaum, "Structured Computer Organization", 5th Edition PHI/Pearson,2007.
2 Sivaraama Dandamudi, "Fundamentals or Computer Organization and Design", Springer Int. Edition,2010.
3 John L. Hennessy and David A. Patterson, "Computer Architecture a quantitative approach", 3rd Edition, Elsevier,2003.
4 Joseph D.Dumas II,"Computer Architecture:Fundamentals and principles of Computer Design",BS Publication, 2012.

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16CS2411   **DATA STRUCTURES THROUGH 'C' LAB**

COURSE OUTCOMES:

At the end of the course students able to

1   Develop Programs Using Recursive Functions.
2   Implement Stacks and Queues using Arrays.
3   Develop Programs for Searching and Sorting Algorithms.
4   Develop Programs Using Concepts of Trees.
5   Apply Concepts of Graphs.

LIST OF EXPERIMENTS

1   Write C programs to implement the Stack using Arrays.
2   Write C programs to implement the Queue using Arrays.
3   Write a C Program to solve the Towers of Hanoi problem.
4   Write C programs to implement the following Stack Applications
     i) Infix to post fix ii) Evaluations of Postfix Expression.
5   Write C program to implement the following types of Queues
     i) Priority Queue ii) Circular Queue.
6   Write C programs to implement the Singly linked list.
7   Write C programs to implement the doubly linked list.
8   Write C programs to implement the following Search Algorithms:
     i) Linear Search ii) Binary Search iii) Fibonacci Search.
9   Write C programs to implement the following Sorting Algorithms
     i) Bubble Sort ii) Insertion Sort.
10 Write C programs to implement the following Sorting Algorithms
     i) Merge Sort ii) Quick Sort.
11 Write C programs to implement the following sorting Algorithms
     i) Selection Sort. ii) Heap Sort.
12 Write a C program to implement binary tree using Arrays and to perform Binary tree traversals i) Inorder ii) Preorder, iii) Postorder

TEXT BOOKS:

1   G.A.V PAI, Data Structures and Algorithms, Concepts, Techniques and Applications, Volume1, 1stEdition, Tata McGraw-Hill, 2008.
2   Richard F. Gilberg & Behrouz A. Forouzan, Data Structures, Pseudo code Approach with C, 2ndEdition, Cengage Learning India Edition, 2007.

REFERENCE BOOKS:

1   Langsam,M. J. Augenstein, A. M. Tanenbaum, Datastructures using C and C++, 2nd Edition, PHI Education, 2008.
2   Sartaj Sahni, Ellis Horowitz, Fundamentals of at Structures in C, 2nd Edition, Orientblackswan, 2010.

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16EC2407   **ANALOG CIRCUIT ANALYSIS LAB**

COURSE OUTCOMES:

At the end of the course students able to

1. Understand the operation BJT and FET amplifiers for different configurations.
2. Apply the knowledge to the analysis and design multistage amplifiers.
3. Compare and construct different feedback amplifiers and their characteristics practically.
4. Design and analyze oscillators using transistor.
5. Learn the concept of different power amplifiers and comparisons with real time applications.

List of Experiments: Experiments to be performed using Discrete components and Simulation tool.

1. Common Emitter amplifier.
2. Common Base Amplifier.
3. Common Source Amplifier.
4. Common Drain Amplifier.
5. Two Stage RC Coupled Amplifiers.
6. Current shunt Feedback Amplifier.
7. Voltage Feedback Amplifier.
8. Wien Bridge Oscillator using Transistors.
9. RC Phase Shift Oscillator using Transistors.
10. Hartley and Colpitts Oscillator using Transistors.
11. Class A Power Amplifier (Transformer less).
12. Class B Complementary Symmetry Amplifier..
13. Design of series voltage regulator.
14. Design of shunt voltage regulator.

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16EC2408   **PULSE AND DIGITAL CIRCUITS LAB**

COURSE OUTCOMES:

At the end of the course students able to

1   Design and analyze diode applications like Linear and non linear wave shaping.
2   Design and analyze design of logic gates.
3   Design and analyze Switching characteristics of diodes and transistors.
4   Construct the circuits of Multivibrators and Schmitt trigger.
5   Model the circuits of time Base generators and oscillators.

List of Experiments:

1) Linear wave shaping.
2) Non linear wave shaping-clippers.
3) Non linear wave shaping-clampers.
4) Transistor as a switch.
5) Design of logic gates.
6) Study of flip-flops.
7) Sampling gates.
8) Astable Multivibrator.
9) Monostable Multivibrator.
 10) Bistable Multivibrator.
 11) Schmitt trigger.
12) UJT Relaxation oscillator.
13) Colpitts oscillator.
14) RC- Phase shift oscillator.

Additional Experiments:

15) Bootstrap sweep circuit.
16) Constant current sweep generator using BJT.

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16AS3401   **TECHNICAL SEMINAR**

A Technical Seminar shall have two components, one chosen by the student from the course work as an extension and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before a committee consisting of Head of the department, seminar supervisor and a senior faculty member. Each Technical Seminar shall be evaluated for 100 marks. Technical Seminar component-I for 50 marks and component-II for 50 marks making total 100 marks. (**Distribution of marks for 50:** 10 marks for report,   10 marks for subject content, 20 marks for presentation and 10 marks for queries).

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16AS3402   **SOFT SKILLS PRACTICE**

COURSE OUTCOMES:
At the end of the course students able to
1   Receive the support they need to resolve issues and make decisions.
2   Explore their personal resources and aptitudes.
3   Understand new career prospects and strive for personal development.
4   Make a proper and informed decision for their career.

1.   Introduction - What are Soft Skills?

Importance of Soft Skills – Selling your soft skills – Attributes regarded as Soft Skills – Soft skills – Social soft skills – Thinking soft skills – Negotiating – Exhibiting your soft skills – Identifying your soft skills – improving your soft skills – will formal training enhance your soft skills – soft skills training – Train yourself – practicing soft skill – Measuring Attitude.

Activity: Measure your Soft Skill.

2.   Know Thyself / Self – Discovery

Introduction – Importance of knowing yourself – Process of knowing yourself – SWOT analysis – Benefits of SWOT analysis – using of SWOT analysis – SWOT analysis grid – Questions to complete the grid.

Activity: Know yourself.

3.   Developing Positive Attitude

Introduction – Meaning – Features of Attitude – Attitude and behavior – Formation of attitudes – change of attitudes – what can you do to change attitude ? Ways of changing attitude in a person – Attitude in a work place – The power of positive attitude – Developing positive attitude – Obstacles in developing positive attitude – Staying positive – Examples of positive attitude – positive attitude and its result – staying negative – examples of negative attitude – Overcoming negative attitude – Negative attitude and its results.

Activity: Measure your attitude.

4.   Forming Values

Introduction – Meaning – What is a value? – A core of Values – Values relating to educations – Values relating to self and others – Values relating to Civic responsibilities – Values and attitudes – Importance of values – Formation of values – Types of Values – Terminal and

Instrumental Values – Power of Values – Personal Values – Cultural Values – Values – some examples.

Activity: Identity your values.

5. <u>Improving Perceptions</u>

Introduction – Meaning – Factors influencing Perception – Perceptual process – Improving perception – Perception and its application in organizations.

Activity: Test your Perception.

6. <u>Career Planning</u>

Introduction – Benefits of career planning – Guidelines for choosing a career – Myths about choosing a career – Tips for successful career planning – Developing career goals – Final thoughts on career planning – Things one should know while starting career and during his career.

Activity: Test your career interests.

7. <u>Art of Listening</u>

Introduction –What is Listening? – Two ears, one mouth – Benefits of active listening – kinds of listening – Factors that hamper listening – Common poor listening habits – Advantages of active listening – Listening tips.

Activity: Test your listening skills.

8. <u>Art of Reading</u>

Introduction – Reading is a Cognitive process – Good readers are what they read – Benefits of reading – Different types of reading – Tips for effective reading – The SQ3R Technique – Different stages of reading – Rates of reading – Determining a students' reading rate – Adjusting reading rate – Activities for increasing reading rate – Problems with reading – Becoming an effective reader.

Activity: Test your reading skills.

9. <u>Body Language</u>

Introduction – Body talk – Voluntary and involuntary body language – Forms of body language – Parts of body language – Origin of body language in building interpersonal relations – Reasons to study body language – Body language in building industrial relations – Improving body language – Types of body language – Gender differences – Female interest and body language – shaking hands with Women – Interpreting body language – Developing confidence with correct body language.

10. <u>Team Building and Teamwork</u>

Introduction – Meaning – Aspects of Team building – Skills needed for Team work – A model of team building – Team vs Group – Characterizer of effective team – Role of a team leader – nine persons a successful team should have – inter – group collaboration – Advantages of Inter-group collaboration – Differences faced in intergroup collaboration.

Activity: Test your team work skills.

11. <u>Group Discussion</u>

Introduction – Meaning of GD – Why Group Discussion – Charaters tested in a GD – Tips of GD – skills required in a GD – consequences of GD – Behaviour in a GD – Essential elements of GD – Traits tested in a GD – GD etiquette – Areas to be concentrated while preparing for a GD – Initiating a GD – Non-verbal communication in GD – Movement and Gestures to be avoided in a GD – Topics for GD.

Activity: Group Discussion.

12. <u>Interview Skills</u>

Introduction – Why an interview – Type of interview – Interview panel – Types of Questions asked – Reason for selecting a candidate – Reasons for selecting a candidate – Reasons for rejecting a candidate – on the day of interview – on to the interview table – attending job fair – common mistakes that you wouldn't want to do – question the candidate should not ask during the interview – pot interview etiquette – How does one follow-up? – Telephonic interview – Dress code at interview – Typical questions asked – Interview mistakes – quick tips – How to present well in interview – Tips to make a good impression in an interview – Job interview – Basic tips – How to search for job effectively – Interview quotations.

13. <u>Time Management</u>

Introduction – The 80:20 rule – Take a good look at the people around you – Examine your work – sense of time management – Time is money – Features of Time – Three secrets of time management – Time management matrix – Analysis of time matrix – Effective scheduling – Group of activities – Five steps to successful time management – difficulties in time management – Evil of not planning – time management is a myth – overcoming procrastination – ways to find free time – Time Management tips for students – Interesting facts about time – Ideal way of spending a day – time wasters – time savers – realizing the valve of time – time circle planner.

Activity: Test your time management skills.

14. <u>Stress Management</u>

Introduction – Meaning – At one level stress may be a positive aid to performance – At one level stress may be a negative aid to performance – Effects of stress – Kinds of stress – sources of stress – Few other common sources of stress case study – behaviors identified with

stress – Assessing the existence of stress – What are signs of stress? – Spotting stress in you – stress management tips : Teenage stress – Make the mornings memorable.

REFERENCE BOOKS:

1   Soft Skills : Life skills, Communication Skills, Employability skills and Corporate skills.
    Authors : S. Hariharan, N. Sundararajan and S.P. Shanmugapriya
    Publishers : MJP Publishers
2   Soft Skills : Know yourself and know the world.
    Authors : Alex
    Publishers : S Chand & Co., New Delhi.
3   Making work for highly sensitive person.
    Authors : Bevertly Jaeger, Ph.D.
    Publishers : Tata Mcgraw hill Education

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16AS3403   PROFESSIONAL SOCIETY ACTIVITIES-II

Professional Society Activities (PSA) course is aimed at enhancing the self learning, communication, managerial skills of the students by engaging them in various Co & Extra Curricular activities activities during their course of study. Activities in each of the department shall be designed and conducted by the Professional Society Executive Committee whose composition is:

1. Faculty Mentors- 2 No.
2. Student Chairman: 1 No.- Final year Student
3. Student General Secretary: 1 No.- Third year Student
4. Treasurer: 1 No.- Third year Student

Student Members: 2 No.s from each class

PSA related activities would be of the following nature but not limited to:

Activity#0   : Constitution of Student Body at respective departments & Inaugural

Function

Activity#1   : Just A Minute

Activity#2   : Technical Quiz

Activity#3   : Open House- Lab Demo

Activity#4   : Technical Paper Presentation- Preliminary

Activity#5   : Technical Paper Presentation- Final

Activity#6   : Poster Presentation

Activity#7   : Collage- A theme based event

Activity#8   : Debate Competition

Activity#9   : Group Discussion Competition

Activity#10   : Mock Interviews

Activity#11   : Model Exhibition

Activity#12 : Valedictory Function

> **Composition of Professional Society Executive Committee**:
> 6. Faculty Mentors- 2 No.
> 7. Student Chairman: 1 No.- Final year Student
> 8. Student General Secretary: 1 No.- Third year Student
> 9. Treasurer: 1 No.- Third year Student
> 10. Student Members: 2 No.s from each class