J.B. INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS)

Bhaskar Nagar, MoinabadMandal, R.R. District, Hyderabad -500075

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech - ELECTRICAL AND ELECTRONICS ENGINEERING: R-18

COURSE STRUCTURE FOR II YEAR: B.Tech (2018-2019)

Sl. No	Course Code	Course Title	L	T	P	Credits
1	BS 101	Mathematics-I	3	1	0	4
2	ES 103	Programming for Problem Solving	3	0	0	3
3	BS 104	Engineering Chemistry	3	1	0	4
4	ES 105	Programming for Problem Solving Lab	0	0	4	2
5	ES 106	Workshop and Manufacturing Practices	1	0	4	3
6	BS 107	Chemistry Lab	0	0	3	1.5
		Induction Programme				
		Total Credits	**10**	**2**	**11**	**17.5**

Sl. No	Course Code	Course Title	L	T	P	Credits
1	BS 201	Mathematics-II	3	1	0	4
2	HS201	English	2	0	0	2
3	ES 201	Basic Electrical Engineering	3	1	0	4
4	ES 202	Engineering Drawing & Computer Graphics	1	0	4	3
5	BS 202	Applied Physics	3	1	0	4
6	HS 202	English Language and CommunicationSkills Lab	0	0	2	1
7	ES 204	Basic Electrical Engineering Lab	0	0	2	1
8	BS 204	Applied Physics Lab	0	0	3	1.5
		Total Credits	**12**	**3**	**11**	**20.5**

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B.Tech - ELECTRICAL AND ELECTRONICS ENGINEERING: R-18

COURSE STRUCTURE FOR II YEAR: B.Tech (2018-2019)

II YEAR- I SEMESTER

Sl. No.	Code	Course Title	L	T	P	C
1.	F210A	Mathematics – III	3	1	0	4
2.	F212A	Electrical Circuit Analysis	3	0	0	3
3.	F214A	Electronic Devices and Circuits	3	0	0	3
4.	F212B	Electrical Machines – I	3	1	0	4
5.	F214F	Electromagnetic Fields	3	1	0	4
6.	F2141	Electronic Devices and Circuits Lab	0	0	2	1
7.	F2121	Electrical Circuits Lab	0	0	3	1.5
8.	F2122	Electrical Machines Laboratory – I	0	0	3	1.5
9.	F210C	Gender Sensitization	2	0	0	0
TOTAL CREDITS			**17**	**3**	**8**	**22**

II YEAR- IISEMESTER

Sl. No.	Code	Course Title	L	T	P	C
1.	F224A	Digital Electronics	3	0	0	3
2.	F222A	Electrical Machines – II	3	1	0	4
3.	F222B	Power Electronics	3	0	0	3
4.	F220C	Management Sciences	3	0	0	3
5.	F220D	Biological Sciences	3	0	0	3
6.	F2221	Digital Electronics Laboratory	0	0	2	1
7.	F2222	Electrical Machines Laboratory – II	0	0	3	1.5
8.	F2223	Power Electronics Laboratory	0	0	3	1.5
9.	F220E	Environmental Sciences	2	0	0	0
TOTAL CREDITS			**17**	**1**	**8**	**20**

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COURSE STRUCTURE FOR II YEAR: B.Tech (2018-2019)

II YEAR- I SEMESTER

Sl. No.	Code	Course Title	L	T	P	C
1.	F210A	Mathematics – III	3	1	0	4
2.	F212A	Electrical Circuit Analysis	3	0	0	3
3.	F214A	Electronic Devices and Circuits	3	0	0	3
4.	F212B	Electrical Machines – I	3	1	0	4
5.	F214F	Electromagnetic Fields	3	1	0	4
6.	F2141	Electronic Devices and Circuits Lab	0	0	2	1
7.	F2121	Electrical Circuits Lab	0	0	3	1.5
8.	F2122	Electrical Machines Laboratory – I	0	0	3	1.5
9.	F210C	Gender Sensitization	2	0	0	0
TOTAL CREDITS			**17**	**3**	**8**	**22**

II YEAR- IISEMESTER

Sl. No.	Code	Course Title	L	T	P	C
1.	F224A	Digital Electronics	3	0	0	3
2.	F222A	Electrical Machines – II	3	1	0	4
3.	F222B	Power Electronics	3	0	0	3
4.	F220C	Management Sciences	3	0	0	3
5.	F220D	Biological Sciences	3	0	0	3
6.	F2221	Digital Electronics Laboratory	0	0	2	1
7.	F2222	Electrical Machines Laboratory – II	0	0	3	1.5
8.	F2223	Power Electronics Laboratory	0	0	3	1.5
9.	F220E	Environmental Sciences	2	0	0	0
TOTAL CREDITS			**17**	**1**	**8**	**20**

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UGC AUTONOMOUS

Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech.: EEE	**L**	**T-P-D**	**C**
I Year -I Semester	**3**	**1-0-0**	**4**

MATHEMATICS-I
(LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS)
(COMMON TO CE, EEE, ME, ECE, CSE, IT, ECM &MIE)

Course Objectives:

- To study matrix algebra and its use in solving system of linear equations and in solving Eigen valueproblems.
- To provide an over view of Ordinary differential equations in First order & Higherorder.
- Concept of Sequence & nature ofseries.

Course outcomes: After the completing the course the students will able to

- Solve system of linear equations and eigen valueproblems.
- Identify whether the given differential equation of first order is exact ornot
- Solve higher differential equation and apply the concept of differential equation to real worldproblems
- Find the nature of sequences &series.

UNIT – I: MATRICES : (10L)

Matrices: Types of Matrices, Symmetric; Hermitian; Skew-symmetric; Skew- Hermitian; orthogonal matrices; Unitary Matrices; rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method;

System of linear equations; solving system of Homogeneous and Non-

Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.

UNIT – II: EIGEN VALUES and EIGEN VECTORS : (10L)

Linear Transformation and Orthogonal Transformation: Eigen values and Eigenvectors and their properties: Diagonalization of a matrix;

Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal Transformation

UNIT – III : SEQUENCES and SERIES : (10L)

Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences. Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test; Raabe's test; Cauchy's Integral test; Cauchy's root test; logarithmic test.

$e^{ax}, \sin ax, \cos ax,$

Alternating series: Leibnitz test; Alternating Convergent series: Absolute and Conditionally Convergence

UNIT – IV: FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS : (8L)

Exact, linear and Bernoulli's equations; Applications : Newton's law of cooling, Law of natural growth and decay;

Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut'stype.

UNIT – V : ORDINARY DIFFERENTIAL EQUATIONS OF HIGHER ORDER : (10L)

Second order linear differential equations with constant coefficients: Non-Homogeneous terms ofthetype$e^{ax}, \sin ax, \cos ax,$ polynomials in$x$ $e^{ax}V(x)$, and$x\,V(x)$;

Method of variation of parameters; Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition,2010

2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.

3. R.K.Jain& S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 4th Edition,2014.

REFERENCES:

1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint,2008.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint,2010.

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UGCAUTONOMOUS

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B.Tech. : EEE	**L**	**T-P-D**	**C**
I Year -I Semester	**3**	**0-0-0**	**3**

PROGRAMMING FOR PROBLEM SOLVING (COMMON TO EEE, ECE & ECM)

Course Objectives:

- To learn the fundamentals ofcomputers.
- To understand the various steps in programdevelopment.
- To learn the syntax and semantics of C programminglanguage.
- To learn the usage of structured programming approach in solving problems.

Course outcomes: After the completing the course the students will able to

- To write algorithms and to draw flowcharts for solvingproblems.
- To convert the algorithms/flowcharts to Cprograms.
- To code and test a given logic in C programminglanguage.
- To decompose a problem into functions and to develop modularreusable code.
- To use arrays, pointers, strings and structures to write Cprograms.
- Searching and sortingproblems.

UNIT – I: INTRODUCTION TO PROGRAMMING :

Introduction to components of a computer system: disks, primary and secondary memory, processor, operating system, compilers, creating, compiling and executing a program etc., Number systems. Introduction to Algorithms: steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudo code with examples, Program design and structured programming. Introduction to C Programming Language: variables (with data types and space

requirements), Syntax and Logical Errors in compilation, object and executable code , Operators, expressions and precedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion, The main method and command line arguments

Bitwise operations: Bitwise AND, OR, XOR and NOT operators Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, goto, Iteration with for, while, do- while loops. I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr

UNIT – II: ARRAYS, STRINGS, STRUCTURES AND PREPROCESSOR:

Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays. **Strings:** Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings

Structures: Defining structures, initializing structures, unions, Array of structures **Preprocessor:** Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef.

UNIT – III: POINTERS AND FILE HANDLING IN C:

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self-referential structures, usage of self-referential structures in linked list (no implementation) Enumeration data type.

Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions.

UNIT – IV : FUNCTION AND DYNAMIC MEMORY ALLOCATION:

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions,

passing pointers to functions, idea of call by reference, Some C standard functions and libraries. **Recursion:** Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursivefunctions.

Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays of different data types.

UNIT – V : INTRODUCTION TO ALGORITHMS:

Basic searching algorithms (linear and binary search techniques).

Basic sorting algorithms (Bubble, Insertion, Quick, Merge and Selection sort algorithms) Basic concept of order of complexity through the example programs

TEXT BOOKS:

1. Reema Thareja, Programming in C, Oxford universitypress.
2. B.A. Forouzan and R.F. Gilberg, C Programming and Data Structures, Cengage Learning, (3rdEdition)

REFERENCES:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall ofIndia
2. R.G. Dromey, How to solveit by Computer, Pearson (16thImpression)
3. Stephen G. Kochan, Programming in C, Fourth Edition, Pearson Education.
4. Herbert Schildt, C: The Complete Reference, McGraw Hill, 4thEdition
5. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

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B.Tech. : EEE	**L**	**T-P-D**	**C**
I Year -I Semester	**3**	**1-0-0**	**4**

ENGINEERING CHEMISTRY
(COMMON TO EEE, ECE & ECM)

Course Objectives:

- To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfectengineer.
- To include the importance of spectroscopic techniques and molecular energy levels.
- To acquire knowledge of chemical reactions those are used in the synthesis of molecules.

Course outcomes:

The concepts developed in this course will aid in quantification of several concepts in chemistry that have been introduced at the 10+2 levels in schools. Technology is being increasingly based on the electronic, atomic and molecular level modifications. Quantum theory is more than 100 years old and to understand phenomena at nanometer levels; one has to base the description of all chemical processes at molecular levels. The course will enable the student to:

- Students can analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecularforces.
- Students can rationalize bulk properties and processes using thermodynamic considerations. Students can distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopictechniques.
- Students can predict potential applications of chemistry and practical utility in order to become good engineers andentrepreneurs.

UNIT – I: ATOMIC STRUCTURE AND THEORIES OF BONDING:

Atomic and Molecular orbitals. Linear Combination of Atomic Orbitals (LCAO), molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N_2, O_2, F_2, CO and NO.

Crystal Field Theory (CFT): Salient Features of CFT – Crystal Field Splitting of transition metal ion d- orbitals in Tetrahedral, Octahedral and square planar geometries. Band structure of solids and effect of doping onconductance.

UNIT – II: WATER AND ITS TREATMENT:

Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complexometric method. Potable water and its specifications. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization.

Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis. Numerical problems.

UNIT – III : ELECTROCHEMISTRY AND CORROSSION:

Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – calomel, Quinhydrone and glass electrode. Nernst equation, determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Numerical problems. Batteries – Primary (Lithium cell) and secondary batteries (Lead – acid storagebattery).

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current cathodic methods. Surface coatings – metallic coatings – techniques of coating-hot dipping, cementation and electroplating ofCopper.

UNIT – IV: SPECTROSCOPIC TECHNIQUES AND APPLICATIONS:

Principles of spectroscopy, selection rules and applications of electronic spectroscopy. Vibrational and rotational spectroscopy.

Basic concepts of Nuclear magnetic resonance Spectroscopy, chemical shift. Introduction to Magnetic resonance imaging.

UNIT – V: REACTION MECHANISM AND SYNTHESIS OF DRUG MOLECULES:

Substitution reactions: Nucleophilic substitution reactions: Mechanism of SN1, SN2 reactions. Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and anti Markownikoff's additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydro halogenation of alkylhalides. Saytzeff rule.

Oxidation reactions: Oxidation of alcohols using KMnO4 and chromic acid. Reduction reactions: reduction of carbonyl compounds using LiAlH4& NaBH4. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

TEXT BOOKS:

1. P. C. Jain & M. Jain; DhanpatRai, Engineering Chemistry, Publishing Company (P) Ltd., NewDelhi.
2. C.N. Banwell, Fundamentals of MolecularSpectroscopy
3. K.P.C. Volhardt and N. E. Schore, Organic Chemistry: Structure and Function, 5thEdition.
4. B.M. Mahan, University Chemistry, Pearson IVEdition.
5. P.W. Atkins, PhysicalChemistry.
6. by B.L. Tembe, Kamaluddin and M.S. Krishnan, Engineering Chemistry (NPTELWeb-book).]

REFERENCES:

1. B. L. Tembe, Kamaluddin and M.S.Krishnan, Engineering Chemistry (NPTEL webbook)
2. D.Narsipuri, Stereochemistry of organic compounds, published by New age internationalpublishers.

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B.Tech. : EEE	L	T-P-D	C
I Year -I Semester	0	0-4-0	2

PROGRAMMING FOR PROBLEM SOLVING LAB (COMMON TO EEE, ECE & ECM)

Course Objectives:

The students will learn the following:

- To work with an IDE to create, edit, compile, run and debugprograms
- To analyze the various steps in programdevelopment.
- To develop programs to solve basic problems by understanding basic concepts in C like operators, control statementsetc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arraysetc.
- To write programs using the Dynamic Memory Allocationconcept.
- To create, read from and write to text and binaryfiles.

Course outcomes:

After the completing the course the students will able to

- formulate the algorithms for simpleproblems
- translate given algorithms to a working and correct program
- correct syntax errors as reported by thecompilers
- identify and correct logical errors encountered duringexecution
- represent and manipulate data with arrays, strings andstructures
- use pointers of differenttypes
- create, read and write to and from simple text and binaryfiles
- modularize the code with functions so that they can bereused.

1. SIMPLE NUMERICPROBLEMS:

a) Write a program for find the max and min from the threenumbers.
b) Write the program for the simple, compoundinterest.

c) Write program that declares Class awarded for a given percentage of marks,wheremark<40%=Failed,40%to<60%=Secondclass,60%to <70%=First class, >=70% = Distinction. Read percentage from standard input.

2. EXPRESSIONEVALUATION:

a) Write aC program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use SwitchStatement)

b) Write a program that finds if a given number is a primenumber

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

d) Write a C program to find the roots of a Quadraticequation.

3. ARRAYS AND POINTERS ANDFUNCTIONS:

a) Write a C program to find the minimum, maximum and average in an arrayof integers.

b) Write a C program to find Addition of TwoMatrices

c) Write a C program to find Multiplication of TwoMatrices

d) Write C programs that use both recursive and non-recursive functions

e) Write a program for reading elements using pointer into array and display the values usingarray.

4.Files:

a) Write a C program to display the contents of a file to standard output device.

b) Write a C program which copies one file to another, replacing all lowercase characters with their uppercaseequivalents.

c) Write a C program to count the number of times a character occurs in a text file. The file name and the character are suppliedas command line arguments.

5.Strings:

a) Write a C program to determine if the given string is a palindrome or not (Spelled same in both directions with or without a meaning like madam, civic, noon, abcba,etc.)

b) Write a C program to count the lines, words and characters in a giventext.

6. Sorting andSearching:

a) Write a C program for using binary searchmethod.
b) Write a C program for linearsearch.
c) Write a C program that implements the Bubble sortmethod.
d) Write a C program that implements the Insertion sortmethod.
e) Write a C program that implements the Quick sortmethod.
f) Write a C program that implements the Merge sortmethod.

ADDITIONAL PROGRAMS (Given to Students as Assignment):

1) Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output shouldbe:
   a. 5 x 1 =5
   b. 5 x 2 =10
   c. 5 x 3=15
2) Write a program that shows the binary equivalent of a given positive number between 0to255.
3) Write a C program to find the sum of individual digits of a positive integer and test given number ispalindrome.
4) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by theuser.
5) Write a C program to calculate the following, where x is a fractional value.1-x/2+x^2/4-x^3/6.
6) Write a C program to read in two numbers, x and n, andthencompute the sum of this geometric progression1+x+x^2+x^3+x^n. For example: if n is 3 and xis 5, then the program computes1+5+25+125.
7) Write a C program to find the minimum, maximum and average in an array of integers.
8) Write a functions to compute mean, variance, Standard Deviation, sorting of n elements in single dimensionarray.
9) Write a C program that uses functions to perform thefollowing:
   (a) Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not besame.
   (b) To find the factorial of a giveninteger.
   (c) To find the GCD (greatest common divisor) of two givenintegers.

10) Write a C program that does thefollowing:
    - It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function) Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function). The program should then read all 10 values and print themback.
    - Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the thirdfile).
11) Write a C program to convert a Roman numeral ranging from I to L to its decimalequivalent.
12) Write a C program that converts a number ranging from 1 to 50 to Romanequivalent
13) Write a C program that uses functions to perform the following operations:
    - To insert a sub-string in to a given main string from a givenposition.
    - To delete n Characters from a given position in a givenstring.
14) Write a C program to construct a pyramid of numbers asfollows:

```
1          *          1          1          *
1 2        * *        2 3        2 2          * *
1 2 3      * * *      4 5 6      3 3 3          * * *
                                 4 4 4 4      * *
                                              *
```

15) Write a C program that sorts a given array ofnames.

Suggested Reference Books for solving theproblems:

1. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning,(3rdEdition)
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall ofIndia
3. R.G. Dromey, How to solve it by Computer, Pearson(16thImpression)
4. Stephen G. Kochan, Programming in C, Fourth Edition, PearsonEducation.
5. Herbert Schildt, C: The Complete Reference, McGraw Hill, 4thEdition
   Byron Gottfried, Schaum's Outline of Programming with C,McGraw-Hill

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B.Tech. : EEE	L	T-P-D	C
I Year -I Semester	0	0-3-0	1.5

CHEMISTRY LABORATORY
(COMMON TO EEE, ECE & ECM)

Course Objectives:

The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

- Estimation of hardness and chloride content in water to check its suitability for drinkingpurpose.
- To determine the rate constant of reactions from concentrations as a function oftime.
- The measurement of physical properties like adsorption andviscosity.
- To synthesize the drug molecules and check the purity of organic molecules by thin layer chromatographic (TLC)technique

Course outcomes:

The experiments will make the student gain skills on:

- Determination of parameters like hardness and chloride content inwater.
- Estimation of rate constan of a reaction from concentration – timerelationships.
- Determination of physical properties like adsorption and viscosity.
- Calculation of R_f values of some organic molecules by TLCtechnique.

1. Determination of total hardness of water by complexometric method usingEDTA
2. Determination of chloride content of water byArgentometry
3. Estimation of an HCl by Conductometrictitrations
4. Estimation of Acetic acid by Conductometrictitrations

5. Estimation of HCl by Potentiometrictitrations
6. Estimation of Fe^{2+} by Potentiometry usingKMnO4
7. Estimation of amount of Cu^{+2} byColorimetry
8. Estimation of amount of KMnO4 byColorimetry
9. Synthesis of Aspirin andParacetamol
10. Determination of acid value of coconutoil
11. Thin layer chromatography calculation of R_f values. egortho and para nitrophenols
12. Determination of viscosity of castor oil and ground nut oil by using Ostwald'sviscometer.
13. Determination of partition coefficient of acetic acid between n-butanol andwater.
14. Determination of surface tension of a give liquid usingstalagmometer.

REFERENCES:

1. B.D. Khosla, A. Gulati and V. Garg ,Senior practical physical chemistry, B (R. Chand & Co.,Delhi)
2. K.K. Sharma and D. S. Sharma , An introduction to practical chemistry, (Vikas publishing, N.Delhi)
3. Vogel's text book of practical organic chemistry 5thedition
4. S.S. Dara, Text book on Experiments and calculations in engineering chemistry.

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UGCAUTONOMOUS

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B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	3	1-0-0	4

MATHEMATICS-II (ADVANCED CALCULUS)
(COMMON TO CE, EEE, ME, ECE, CSE, IT, ECM & MIE)

Course Objectives: To learn

- Geometrical approach to the mean value theorems and their application to the mathematicalproblems
- Evaluation of improper integrals using Beta and Gammafunctions.
- Finding maxima and minima of function of two and threevariables
- Evaluation of multiple integrals and theirapplications
- The physical quantities involved in engineering field related to vector valuedfunctions
- The basic properties of vector valued functions and their applications to line, surface and volumeintegrals

Course outcomes: After the completing the course the students will able to

- Solve the applications on the mean valuetheorems.
- Evaluate the improper integrals using Beta and Gammafunctions.
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangularparallelepiped.
- Evaluate the line, surface and volume integrals and converting them from one toanother

UNIT – I: CALCULUS : (10L)

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's Series.

Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT –II:MULTIVARIABLE CALCULUS (PARTIAL DIFFERENTIATION AND APPLICATIONS) :(8L)

Definitions of Limit and continuity. Partial Differentiation; Euler's Theorem; Total derivative;

Jacobian; Functional dependence & independence, Maxima and minimaof functions of two variables and three variables using method of Lagrange multipliers.

UNIT – III: MULTIVARIABLE CALCULUS (INTEGRATION): (10L)

Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals), Centre of mass and Gravity (constant and variable densities) by double and triple integrals (applications involving cubes, sphere and rectangular parallelopiped).

UNIT – IV : VECTOR DIFFERENTIATION : (10L)

Vector point functions and scalar point functions. Gradient, Divergence and Curl.

Directional derivatives, Tangent plane and normal line. Vector Identities. Scalar potential functions. Solenoidal and Irrotational vectors.

UNIT – V : VECTOR INTEGRATION : (10L)

Line, Surface and Volume Integrals.

Theorems of Green, Gauss and Stokes (without proofs) and their applications.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition,2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley &Sons,2006.
   R.K.Jain& S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 4th Edition,2014.

REFERENCES:

1. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, LaxmiPublications, Reprint,2008.
2. G.B.Thomas and R.L.Finney, Calculus and Analytic Geometry, 9th Edition, Pearson, Reprint,2010.

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UGCAUTONOMOUS

Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	2	0-0-0	2

ENGLISH
(COMMON TO EEE, ME, ECE, CSE, IT & MIE)

Course Objectives:

- To improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writingskills.
- To equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.
- To develop study skills and communication skills in formal and informal situations.

Course outcomes: Students should be able to

- To use English Language effectively in spoken and writtenforms.
- To comprehend the given texts and respondappropriately.
- To communicate confidently in various contexts and differentcultures.
- To acquire basic proficiency in English including reading and listening comprehension, writing and speakingskills.

UNIT –I:

'The Raman Effect' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes and Suffixes. **Grammar:** Identifying Common Errors in Writing with Reference to Articles and Prepositions. **Reading:** Reading and Its Importance- Techniques for Effective Reading.

Basic Writing Skills: Sentence Structures -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – **Paragraph writing** – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

UNIT – II:

'Ancient Architecture in India' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Synonyms and Antonyms, Homophones, Homonyms, and Homographs. **Grammar:** Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.

UNIT – III :

'Blue Jeans' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English. **Grammar:** Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses. **Reading:** Sub- skills of Reading- Skimming andScanning

Writing: Nature and Style of Sensible Writing- **Defining- Describing** Objects, Places and Events – **Classifying**- Providing Examples or Evidence and Essay Writing

UNIT – IV:

'What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Standard Abbreviations in English **Grammar:**
Redundancies and Clichés in Oral and Written Communication.

Reading: Comprehension- Intensive Reading and Extensive Reading.

Writing**: Writing Practices**--Writing Introduction and Conclusion - Précis Writing.

UNIT – V :

'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Technical Vocabulary and their usage. **Grammar:** Common Errors in English

Reading: Reading Comprehension-Exercises for Practice. **Writing: Technical Reports**- Introduction – Characteristics of a Report – Categories of Reports

TEXT BOOKS:

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge UniversityPress.

REFERENCES:

1. Swan, M. (2016). Practical English Usage. Oxford UniversityPress.
2. Kumar, S and Lata, P. (2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007).Remedial English Grammar.Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper ResourceBook.
5. Hamp-Lyons, L. (2006).Study Writing. Cambridge UniversityPress.
6. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford UniversityPress.

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UGCAUTONOMOUS

Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	**L**	**T-P-D**	**C**
I Year -II Semester	**3**	**1-0-0**	**4**

BASIC ELECTRICAL ENGINEERING
(COMMON TO EEE, ECE & ECM)

Course objectives:

- To **introduce** the concepts of electrical circuits and its components.
- To **understand** magnetic circuits, DC circuits and AC single phase and three phase circuits.
- To **study** and **understand** the different types of DC/AC machines and transformers.
- To import the **knowledge** of various electrical installations

Course Outcomes:

The students may be able to:

- **Analyze** and **Solve** electrical circuits using network laws and theorems.
- **Understand** and **Analyze** basic electric and magnetic circuits.
- Get an **Exposure** of working principles of electrical machines.
- **Introduce** components of low voltage electrical installations.

UNIT-I: DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff's current and voltage laws, analysis of simple circuits with DC excitation.

Superposition, Thevenin and Norton Theorems. Time-domain analysis of first- order RL and RC circuits.

UNIT –II: AC Circuits: Representation of sinusoidal waveforms, peak and RMS values, phasor representation, real power, reactive power, apparent power, power factor.

Analysis of single-phase AC circuits consisting of R, L, C, RL, RC and

RLC series combinations, resonance in series RLC circuit. Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III: Transformers: Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit.

Losses in transformers, regulation and efficiency. Auto-transformer and three- phase transformer connections.

UNIT-IV: Rotating Electrical Machines: D.C Motors - principle of operation, characteristics, speed control and application of series and shunt motor.

Three-phase induction motor - construction, generation of rotating magnetic fields, principle of operation, torque-slip characteristics. Single-phase induction motor - construction, working, torque-speed characteristic.

UNIT –V: Electrical Installations: Components of LT switchgear: Switch fuse unit (SFU), MCB, ELCB, MCCB, types of wires and cables, earthing.

Types of batteries, important characteristics for batteries. Elementary calculations for energy consumption, power factor improvement and battery backup

TEXT BOOKS :

1. D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill,2010.
2. D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill,2009.
3. L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press,2011.

REFERENCES:

1. E. Hughes, “Electrical and Electronics Technology”, Pearson,2010.
2. V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

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B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	1	0-0-4	3

ENGINEERING DRAWING & COMPUTER GRAPHICS
(Theory and Lab)
(COMMON TO CE, EEE, CSE, IT & ECM)

Pre-requisites: None

Course objectives: The student will

- Learn a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Prepare to communicate effectively
- Learn to use the techniques, skills, and modern engineering tools necessary for engineering practice

Course Outcomes: After completing this course, the students will be

- Able to understand engineering drawing and its place in society
- Exposed to the visual aspects of engineering drawing and graphics
- Exposed to engineering graphics standards
- Exposed to solid modeling
- Exposed to computer-aided geometric design
- Exposed to creating working drawings
- Exposed to engineering communication

UNIT–I: INTRODUCTION TOENGINEERINGDRAWING Lecture classes and 8 Practical's):

Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular

Hyperbola (General method only);

Cycloid, Epicycloids, Hypocycloid and In volute

UNIT – II : ORTHOGRAPHIC PROJECTIONS AND PROJECTIONS OF POINTS, LINES AND PLANES (2Lecture classes and 12 Practical's):

Principles of Orthographic Projections-Conventions - Projections of Points and lines inclined to both planes;

Projections of planes inclined to both the Planes- Draw simple annotation, dimensioning and scale.

UNIT – III: PROJECTIONS OF REGULAR SOLIDS AND SECTIONAL VIEWS OF RIGHT REGULAR SOLIDS (2Lecture Classes And 12 Practical's):

Projections of regular solids - Prism, Cylinder, Pyramid, Cone – Auxiliary Views;

Draw the sectional views of geometrical solids.

UNIT – IV: ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS (2 Lecture classes and 12 Practical's): Principles of Isometric projection – Isometric Scale, Isometric Views,

Conversion of Isometric Views to Orthographic Views and Vice-versa.

UNIT – V: OVERVIEW OF COMPUTER GRAPHICS (**2 Lecture classes and 16 Practical's):** *Drafting Software*:Computer Aided Drafting (CAD) – Drafting Software – Manual Drafting vs Auto CAD Drafting. *Auto CAD commands*: Starting Auto CAD - Auto CAD commands – (Generation of Points, Lines, Curves and Polygons) - Editing and Modifications.

Drafting Settings - Dimensioning and Text - Geometrical Constructions. Projection of Points - Straight Lines - Plane surfaces – Solids - Isometric projections

Note: CAD Lab facility is required for this unit.
(Only theory Question to be set from this Unit for Examinations)

TEXT BOOKS :

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar PublishingHouse
2. K. Venugopal&V. Prabhu Raja (2011), Engineering Drawing + Auto CAD, New Age International Publishers. FifthEdition.
3. CAD Software Theory and UserManuals

REFERENCES:

1. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers
2. Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication.

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B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	3	1-0-0	4

APPLIED PHYSICS
(COMMON TO EEE ,ECE & ECM)

Course Objectives: The student will

- demonstrate skills in scientific inquiry, problem solving and laboratorytechniques.
- demonstrate competency and understanding of the concepts found in Quantum Mechanics, Semiconductor physics, Fiber optics and lasers and Electromagnetic theory and a broad base of knowledge in physics.
- solve non-traditional problems that potentially draw on knowledge in multiple areas ofphysics.
- study applications in engineering like memory devices, transformer core and electromagneticmachinery.

Course Outcomes: The student will be able to

- learn the fundamental concepts on Quantum behaviour of matter in its microstate.
- get the knowledge of fundamentals of Semiconductor physics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and soon.
- design, characterization and study of properties of material help the students to prepare new materials for various engineeringapplications.
- be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.

UNIT-I: Quantum Mechanics:
Introduction to quantum physics, Black body radiation, Planck's law, Photoelectric effect, Compton effect, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment.

Heisenberg's Uncertainty principle, Born's interpretation of the wave function, Schrodinger's time independent wave equation, Particle in one dimensional box.

UNIT-II: Electronic Materials:
Classical Free electron theory, Quantum free electron theory, Fermi energy level, Occupation probability, Density of States, Bloch Theorem, Kronig- Penny model.

E-K Diagram, Effective massof Electron, Band Theory of solids, Classification ofmaterials.

UNIT-III: Semiconductor Physics:
Intrinsic and Extrinsic semiconductors, Carrier Concentration in intrinsic and extrinsic Semiconductors, Dependence of Fermi level on carrier-concentration and temperature, Carrier generation and recombination.

Carrier transport: diffusion and drift, p-n junction diode, V-I Characteristic, Diode equation(qualitative treatment), Zener diode , Hall effect, LED, Photo diode and Solarcell.

UNIT-IV: Lasers and Fibre Optics :
Lasers: Introduction, absorption, spontaneous emission, Stimulated emission, calculation of Einstein co-efficient, Population inversion, Pumping, Lasing action, Types of Lasers: Ruby laser, He-Ne laser, Semiconductor laser, Applications of laser.

Fibre Optics: Introduction, Construction and working principle of Optical fibre, Acceptance angle, Acceptance cone and Numerical aperture, Types of optical fibres, Applications of opticalfibres.

UNIT-V: Electromagnetism:
Laws of electrostatics, Electric current and the continuity equation, Ampere's and Faraday's laws, Maxwell's equations, The wave equation: Plane Electromagnetic waves in vacuum, their Transverse nature.

Polarisation, Permittivity and Dielectric constant, Internal fields in a solid, Clausius-Mossotti equation, Ferroelectrics andPiezoelectric.

TEXT BOOKS:

1. B.K. Pandey, S. Chaturvedi Engineering Physics, Cengage Learing.
2. Halliday and Resnick, Physics,Wiley.
3. Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - Chand,A text book of Engineering Physics, Chand.

REFERENCES:

1. Richard Robinett, QuantumMechanics
2. S J.Singh, emiconductor Optoelectronics: Physics and Technology, McGraw-Hill inc.(1995).
3. by Monica Katiyar and Deepak Guptha Online Course: "Optoelectronic Materials and Devices" on NPTEL.
4. P.K.Palanisamy, "Engineering Physics", Scitech Publications, Fourth edition.

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B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	0	0-2-0	1

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB
(COMMON TO EEE, ME, ECE, CSE, IT & MIE)

Course Objectives:

To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning

- To sensitize students to the nuances of English speech sounds, word accent, intonation andrhythm
- To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency of students in spoken English and neutralize their mother tongueinfluence
- To train students to use language appropriately for public speaking andinterviews

Course outcomes: The students will be able to attain

- Better understanding of nuances of English language through audio- visual experience and groupactivities
- Neutralization of accent forintelligibility
- Speaking skills with clarity and confidence which in turn enhances their employability skills

The following course content is prescribed for the English for the English Language and Communication Skills Lab based on Unit -6 of AICTE Model Curriculum 2018 for B.Tech First English. As the syllabus is very limited, it is required to prepare teaching/learning materials by the teachers collectively in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning and timesaving in the lab. SYLABUS:

English Language and Communication Sills Lab (ELCS) will have two parts:

a) Computer Assisted Language Learning (CALL)Lab:

Interactive Communication Skills (ICS)Lab:

Exercise – I:

CALL Lab:

Understand:Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening. ***Practice*:** Introduction to Phonetics – Speech Sounds – Vowels and Consonants.

ICS Lab: *Understand:* Communication at Work Place- Spoken vs. Written language. *Practice:* Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise – II:

CALL Lab:

Understand:Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context.

Practice:Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

ICS Lab:

Understand:Features of Good Conversation – Non-verbal Communication.

Practice:Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette

Exercise – III:

CALL Lab:

Understand:Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI).

Practice:Common Indian Variants in Pronunciation – Differences in

British and American Pronunciation.

ICS Lab:

Understand:How to make Formal Presentations.

Practice:Formal Presentations.

Exercise – IV:

CALL Lab:

Understand:Listening for General Details. ***Practice:***Listening Comprehension Tests. **ICS Lab**:

Understand:Public Speaking – Exposure to Structured Talks.

Practice:Making a Short Speech – Extempore.

Exercise – V:

CALL Lab:

Understand:Listening for Specific Details.

Practice:Listening Comprehension Tests. **ICS Lab**:

Understand:Interview Skills

Practice:Mock Interviews.

Computer Assisted Language Learning (CALL) Lab:

The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students. **System Requirement (Hardware component):** *Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:*

i) Computers with Suitable Configuration

ii) High FidelityHeadphones

Interactive Communication Skills (ICS) Lab:

1. **The Interactive Communication Skills Lab:** A Spacious room with movable chairs and audio-visual aids with a Public-Address System,a LCD and a projector etc.

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B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	0	0-2-0	1

BASIC ELECTRICAL ENGINEERING LAB
(COMMON TO EEE, ECE & ECM)

Course Objectives:

- To **analyze** a given network by applying various electrical laws and network theorems.
- To **know** the response of electrical circuits for different excitations.
- To **calculate, measure** and **know** the relation between basic electrical parameters.
- To **analyze** the performance characteristics of DC and AC electrical machines.

Course Outcomes: The student will be able to

- Get an **exposure** to basic electrical laws.
- **Relate** the response of different types of electrical circuits to different excitations.
- **Understand** the measurement, calculation and relation between the basic electrical parameters
- **Inspect** the basic characteristics of transformers and electrical machines.

Choice of 10-12 experiments from the following List of Experiments

1. Verification of Ohms Law.
2. Verification of KVL and KCL.
3. Transient response of series RL and RC circuits using DC excitation.
4. Transient response of RLC series circuit using DC excitation.
5. Resonance in series RLC circuit.
6. Calculations and verification of impedance and current of RL, RC and RLC series circuits.

7. B-H loop for single phase transformers.
8. Measurement of voltage, current and real power in primary and secondary circuits of a single phase transformer.
9. Load test on single phase transformer (Calculate Efficiency and Regulation).
10. Three phase transformer: Verification of relationship between voltages and currents (Star-Delta, Delta-Delta, Delta-star, Star-Star).
11. Measurement of active and reactive power in a balanced three-phase circuit.
12. Performance Characteristics of a DC Shunt Motor.
13. Torque-Speed Characteristics of a DC Shunt Motor.
14. Performance Characteristics of a Three-phase Induction Motor.
15. Torque-speed Characteristics of a Three-phase Induction Motor.

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UGCAUTONOMOUS

Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	L	T-P-D	C
I Year -II Semester	0	0-3-0	1.5

APPLIED PHYSICS LAB
(COMMON TO EEE, ECE & ECM)

Course Objectives: The student will

- Demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- Demonstrate competency and understanding of the concepts found in LED, Electric and Electronic materials a broad base of knowledge in physics.
- Solve Experimental problems that potentially draw on experimental knowledge in multiple areas ofphysics.
- Study applications in engineering like Hall effect, Optical fibre, LASER, Photodiode and Solar cell.

Course Outcomes: The student will be able to

- Learn the experimental concepts on in LED, Electric and Electronic materials.
- Get the knowledge of fundamentals of Semiconductor physics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and soon.
- Design, characterization and study of properties of material help the students to prepare new materials for various engineeringapplications.
- Be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectricmaterials.

List of Experiments:

1. Energy gap of P-N junctiondiode:

To determine the energy gap of a semiconductor diode.

2. SolarCell:
   To study the V-I Characteristics of solar cell.
3. Light emittingdiode:
   Plot V-I and P-I characteristics of light emitting diode.
4. Opticalfiber:
   Determination of Numerical Aperture.
5. Halleffect:
   To determine Hall co-efficient of a given semiconductor.
6. Photoelectric effect:
   To determine work function of a given material.
7. LASER:
   To study the Wave length of LASER Source.
8. Dielectric constant:
   To determine the Dielectric constant of the given material.
9. LCRCircuit:
   To determine the Quality factor of LCR Circuit (Series & Parallel).
10. R-CCircuit:
    To determine the time constant of R-C circuit (Growth and Decay).

Text Books:

1. Dr. Narendra, L. Mathakari, "Experiments in Applied Physics" (Physics Lab Manual 4th edition), " Engineering Physics Lab Manual" By Department of Physics JBIET

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B.Tech. :	L	T	P	C
II Year -I Semester	3	1	0	4

MATHEMATICS-III
(FOURIER SERIES AND COMPLEX ANALYSIS)

Course Objectives: To learn

- Importance of Fourierseries
- Basic properties of complex funtions and analyticfunctions
- Taylor's series ,Maclauren's and Laurent's series expansions of complexfunction
- Evaluation of integrals using residuetheorem.
- The mapping by general analytic functions W=f(z).

Course outcomes: After completion of this course the student will be able to

- Find the series expansions of periodicfunctions
- construct the analyticfunction
- construct Laurent's series about the singularpoints
- use residue theorem to compute several kinds of realintegrals
- construct conformal mappings between many kinds ofdomains

UNIT – I: FOURIER SERIES

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

UNIT-II: FUNCTIONS OF A COMPLEX VARIABLE

Continuity – Differentiability – Analyticity – Properties – Cauchy-Riemann conditions, Maxima – Minima principle, Harmonic and conjugate harmonic functions – Milne – Thompsonmethod.

UNIT-III: COMPLEX INTEGRATION& POWER SERIES

Line integral – evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula. Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series.

UNIT-IV: CONTOUR INTEGRATION

Singular point –Isolated singular point – pole of order m – essential singularity. (Distinction between the real analyticity and complex analyticity)

Residue – Evaluation of residue by formula and by Laurent series - Residue theorem, Evaluation of integrals of the type

(a)Improperreal integrals $\int_{-\infty} f(x)dx$ (b) $\int_c f(\cos\theta, \sin\theta)d\theta$

UNIT-V: CONFORMAL MAPPING

Transformation by e^z , Imz, z^2, z ^{n}(n positive integer), Sin z, cos z, z + a/z. Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties – invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given points.

TEXT BOOKS:

1. Grewal B.S, "Higher Engineering Mathematics", Khanna publications, 42nd edition2012
2. Advanced Engineering Mathematics by Jain and S.R.K. Iyangar, Narosa Publications.
3. Engineering Mathematics by B.V.Ramana, Tata McGrawhill Publishing company Ltd New Delhi, 5th edition,2011

REFERENCES:

1. Engineering Mathematics-III by T.K.V. Iyengar & B.Krishna Gandhi & Others, S.Chand
2. Engineering Mathematics-III by G.Shankar Rao, I.K.International Publications.
3. KREYSZIG. E, "Advanced Engineering Mathematics" JohnWiley & Sons Singapore, 10th edition,2012.
4. Veerarajan.T " Engineering Mathematics-I", Tata McGrawhill Publishing Co.New Delhi, 5th edition,2006.

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Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	L	T	P	C
II Year -I Semester	3	0	0	3

ELECTRICAL CIRCUIT ANALYSIS

Course Objectives:

- To impart **knowledge** on solving circuit equations using network theorems.
- To **find** solution of first and second order networks.
- To **introduce** Phasor diagrams and analysis of three phase circuits.
- To **analyze** electric circuits using Laplace Transform.
- To **educate** on Two Port Network and Network Functions.

Course Outcomes:

At the end of this course, students will be able to:

- **Apply** network theorems for solving DC electric circuit equations.
- **Solve** first and second order networks.
- **Analyze** AC circuits using phasor diagrams.
- **Analyze** electric circuits using Laplace Transform.
- **Understand** Two Port Network and Network Functions.

UNIT 1: Network Theorems: Superposition theorem, Thevenin theorem, Norton theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem.

Analysis with dependent current and voltage sources, Node and Mesh Analysis, Concept of duality and dual networks.

UNIT 2: Solution of First and second order networks: Solution of first and second order differential equations for Series and parallel R-L, R-C, RL-C circuits.

Initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response.

UNIT 3: Sinusoidal steady state analysis: Representation of sine function as rotating phasor, phasor diagrams, impedances and admittances, AC circuit analysis, effective or RMS values, average power and complex power.

Three-phase circuits, Mutual coupled circuits, Dot Convention in coupled circuits, Ideal Transformer.

UNIT 4: Electrical Circuit Analysis Using Laplace Transforms: Review of Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, convolution integral, inverse Laplace transform, transformed network with initial conditions.

Transfer function representation, Poles and Zeros, Frequency response(magnitude and phase plots), series and parallel resonances.

UNIT 5: Two Port Network and Network Functions: Two Port Networks, terminal pairs, relationship of two port variables, impedance parameters, admittance parameters.
Transmission Parameters and hybrid parameters, interconnections of two port networks.

Text Books:

1. M. E. Van Valkenburg, "Network Analysis", Prentice Hall,2006.
2. D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.
3. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education,2013.

References Books:

1. C. K. Alexander and M. N. O. Sadiku, "Electric Circuits", McGraw Hill Education, 2004.
2. K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers,1999.

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B.Tech. : ECE	L	T	P	C
II Year -I Semester	3	0	0	3

ELECTRONIC DEVICES AND CIRCUITS

UNIT – I: Applications of P-N Junction diode characteristics of P-N Junction as a diode, the PN- Junction as a Rectifier, Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Harmonic Components in a Rectifier circuit, Inductor Filters, Capacitor filters, L-section filters, π-Section filters, comparison of filters, DC-power supply circuitdesign,

Special Diodes: Zener Diode,Avalancheand Zener Breakdown, V-Icharacterstics of Zener Diode, voltage regulator using zener diode, Tunnel diode construction and working (using Energy Band diagram), Schottky diode, Photo diode, UJT, SCR their construction and V-I characterstics.

UNIT-II: Transistor (BJT) Characteristics

Introduction to Bi- polar Junction Transistor, Different configurations, current components in a junction Transistor, V-I characteristics in CE and CB configurations. Eber Molls model for a transistor Small Signal Model for BJT.

UNIT-III: Field Effect Transistors (FET)

Comparison of BJT & FET, Construction & Operation of JFET,V-I characterstics of JFET , Determination of FET Parameters from the V-I characterstics .MOSFET Construction & Operation in Enhancement and Depletion modes , V-I characterstics OfMOSFET

UNIT – IV: Biasing & Small Signal Models for Transistors (BJT &FET)

Need for Biasing of transistors, Determination of Quiscent point from the CE characteristics, stability factors S, Introduction to fixed bias, Self bias, collector to base bias. Transistor circuits for Quiscent point and stability factor S. H-Parameter equivalent circuit for BJT Definition &

Determination of h-Parameters from CE V-I Characteristics, Small Signal Models for FET Transistors **Biasing** of FET, Self Bias,

UNIT –V: Integrated circuit fabrication process

Basic Monolithic Integrated Circuits, Integrated Resistors, Capacitors & inductors Epitaxial growth Masking and Etching oxidation, diffusion, ion implantation, photolithography, Monolythic circuit layout , chemical vapor deposition, sputtering, twin-tub CMOS process.

TEXT BOOKS:

1. ELECTRONC DEVICESANDCIRCUITS MILLMAN & HALKIAS McGraw HILL (Mandatory)
2. INTEGRATED ELECTRONICS MILLMAN & HALKIAS McGrawHILL

REFERENCE BOOKS:

1. G. Streetman, and S. K. Banerjee, “Solid State Electronic Devices,” 7th edition, Pearson,2014.
2. D. Neamen , D. Biswas "Semiconductor Physics and Devices," McGraw-HillEducation

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UGCAUTONOMOUS

Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	**L**	**T**	**P**	**C**
II Year -I Semester	**3**	**1**	**0**	**4**

ELECTRICAL MACHINES – I

Course Objectives:

- To impart **knowledge** on magnetic circuit analysis.
- To **study** the construction and operation of DC Machine.
- To be **familiar** with the EMF equation, Torque equation, Armature circuit equation for motoring and generation.
- To **study** the various characteristics of DC Machines and speed control methods.
- To impart **knowledge** on construction, operation, types and testing of Transformer.

Course Outcomes:

At the end of this course, students will be able to:

- **Recollect** magnetic field and magnetic circuit.
- **Explain** the construction and operation of DC Machine.
- **Derive** the EMF equation, Torque equation, Armature circuit equation for motoring and generation.
- **Demonstrate** the various characteristics of DC Machines and speed control methods.
- **Summarize** the construction, operation, types and testing of Transformer.

UNIT 1: Magnetic fields and magnetic circuits: Review of magnetic circuits - MMF, flux, reluctance, inductance; review of Ampere Law and Biot Savart Law, Electromagnetic force and torque: B-H curve of magnetic materials; flux-linkage vs current characteristic of magnetic circuits, linear and nonlinear magnetic circuits Energy stored in the magnetic circuit; force as a partial derivative of stored energy with respect to position of a moving element; torque as a partial derivative of stored energy with respect to angular position of a rotating element.

UNIT 2: DC Machines: Basic construction of a DC machine, magnetic structure - stator yoke, stator poles, pole-faces or shoes, air gap and armature core, visualization of magnetic field produced by the field winding excitation with armature winding open, air gap flux density distribution, flux per pole.

Induced EMF in an armature coil, Armature winding and commutation – Elementary armature coil and commutator.

UNIT 3: Lap and wave windings, construction of commutator, linear commutation Derivation of back EMF equation, armature MMF wave, derivation of torque equation, armature reaction, air gap flux density distribution with armature reaction.

DC machine - motoring and generation: Armature circuit equation for motoring and generation, Types of field excitations –separately excited, shunt and series.

UNIT 4: Open circuit characteristic of separately excited DC generator, back EMF with armature reaction, voltage build-up in a shunt generator, critical field resistance and critical speed.

Characteristics and torque-speed characteristics of separately excited, shunt and series motors. Speed control through armature voltage, Losses, load testing and back-to-back testing of DC machines.

UNIT 5: Transformers: Principle, construction and operation of single-phase transformers, equivalent circuit, phasor diagram, voltage regulation, losses and efficiency Testing - open circuit and short circuit tests, polarity test, back-to-back test, separation of hysteresis and eddy current losses Three-phase transformer - construction, types of connection and their comparative features, Parallel operation of single-phase and three-phase transformers.

Autotransformers - construction, principle, applications and comparison with two winding transformer, Phase conversion - Scott connection, three-phase to six-phase conversion, Tap-changing transformers - No-load and on-load tap-changing of transformers, Three-winding transformers, Cooling of transformers.

Text Books:

1. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGrawHill Education,2013.
2. E. Clayton and N. N. Hancock, "Performance and design of DCmachines", CBS Publishers,2004.
3. M. G. Say, "Performance and design of AC machines", CBS Publishers,2002.

References Books:

1. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
2. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw HillEducation, 2010.

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Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	**L**	**T**	**P**	**C**
II Year -I Semester	**3**	**1**	**0**	**4**

ELECTROMAGNETIC FIELDS

Course Objectives:

- To **introduce** the basic mathematical concepts related to electromagnetic vector fields.
- To impart **knowledge** on the concepts of electrostatic fields, electrical potential, energy density and their applications.
- To impart **knowledge** on the concepts of Magneto static fields, magnetic flux density, vector potential and its applications.
- To impart **knowledge** on the concepts of different methods of EMF generation and Maxwell's equations.
- To impart **knowledge** on the concepts of Electromagnetic waves and characterizing parameters.

Course Outcomes:

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

- **Understand** the basic mathematical concepts related to electromagnetic vector fields.
- **Summarize t**he concepts of electrostatic fields, electrical potential, energy density and their applications.
- **Explain** the concepts of Magneto static fields, magnetic flux density, vector potential and its applications.
- **Explain** the concepts of different methods of EMF generation and Maxwell's equations.
- **Understand** the concepts of Electromagnetic waves and characterizing parameters.

UNIT1: Review of Vector Calculus: Vector algebra addition, subtraction, components of components of vectors, scalar and vector multiplications, triple products, three orthogonal coordinate systems (rectangular, cylindrical and spherical).

Vectorcalculusdifferentiation,Partialdifferentiation,integration, vector operator, gradient, divergence and curl; integral theorems of vectors.

Conversion of avector from one coordinate system to another.

UNIT 2: Static Electric Field: Coulomb's law, Electric field intensity, Electrical field due to point charges. Line, Surface and Volume charge distributions, Gauss law and its applications, Absolute Electric potential, potential difference, calculation of potential differences for different configurations. Electricdipole, Electrostatic Energy and Energy density.

Conductors, Dielectrics and Capacitance: Current and current density, Ohms Law in Point form, Continuity of current, Boundary conditions of perfect dielectric materials. Permittivity of dielectric materials, Capacitance, Capacitance of a two wire line, Poisson's equation, Laplace's equation, Solution of Laplace and Poisson's equation, Application of Laplace's and Poisson's equations.

UNIT 3: Static Magnetic Fields: Biot-Savart Law, Ampere Law, Magnetic flux and magnetic flux density, Scalar and Vector Magnetic potentials. Steady magnetic fields produced by current carrying conductors.

Magnetic Forces, Materials and Inductance: Force on a moving charge, Force on a differential current element, Force between differential current elements, Nature of magnetic materials, Magnetization and permeability, Magnetic boundary conditions, Magnetic circuits, inductances and mutual inductances.

UNIT4: Time Varying Fields and Maxwell's Equations: Faraday's law for Electromagnetic induction, Displacement current.

Point form of Maxwell's equation, Integral form of Maxwell's equations, Motional Electromotive forces. Boundary Conditions.

UNIT 5: Electromagnetic Waves: Derivation of Wave Equation, Uniform Plane Waves, Maxwell's equation in Phasor form, Wave equation in Phasor form, Plane waves in free space and in a homogenous material.

Wave equation for a conducting medium, Plane waves in loss dielectrics, Propagation in good conductors, Skin effect,Poynting theorem.

Text Books:

1. M. N. O. Sadiku, “Elements of Electromagnetics”, Oxford University Publication,2014.
2. A. Pramanik, “Electromagnetism - Theory and applications”, PHI Learning Pvt. Ltd, New Delhi,2009.
3. A. Pramanik, “Electromagnetism-Problems with solution”, Prentice Hall India,2012.

References Books:

1. G. W. Carter, “The electromagnetic field in its engineering aspects”, Longmans,1954.
2. W. J. Duffin, “Electricity and Magnetism”, McGraw HillPublication, 1980.
3. W.J.Duffin,“AdvancedElectricityandMagnetism”,McGrawHill, 1968.

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B.Tech. : ECE	**L**	**T**	**P**	**C**
II Year -I Semester	**0**	**0**	**2**	**1**

ELECTROMAGNETIC FIELDS

Minimum Twelve experiments to be conducted

S.No.	Name of the Experiment
1	Forward & Reverse Bias Characteristics of a PN Junction Diode
2	Zener diode Characteristics and Zener diode as a voltage Regulator.
3	Input & Output Characteristics of Transistor in CB Configuration.
4	Input & Output Characteristics of Transistor in CE Configuration.
5	Half Wave Rectifier with & without filters
6	Full Wave Rectifier with & without filters
7	Bridge Rectifier with & without filters
8	FET characteristics
9	Measurement of h parameters of transistor in CE configuration
10	Frequency Response of CE Amplifier
11	Frequency Response of CC Amplifier
12	Frequency Response of Common Source FET amplifier
13	SCR characteristics
14	UJT Characteristics

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B.Tech. : ECE	**L**	**T**	**P**	**C**
II Year -I Semester	**0**	**0**	**2**	**1**

ELECTRONIC DEVICES AND CIRCUTS LAB
(COMMON TO ECE,ECM,EEE)

S.No.	Name of the Experiment
1	Forward & Reverse Bias Characteristics of a PN Junction Diode
2	Zener diode Characteristics and Zener diode as a voltage Regulator.
3	Input & Output Characteristics of Transistor in CB Configuration.
4	Input & Output Characteristics of Transistor in CE Configuration.
5	Half Wave Rectifier with & without filters
6	Full Wave Rectifier with & without filters
7	Bridge Rectifier with & without filters
8	FET characteristics
9	Measurement of h parameters of transistor in CE configuration
10	Frequency Response of CE Amplifier
11	Frequency Response of CC Amplifier
12	Frequency Response of Common Source FET amplifier
13	SCR characteristics
14	UJT Characteristics

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B.Tech. : EEE	L	T	P	C
II Year -I Semester	0	0	3	1.5

ELECTRICAL CIRCUITS LABORATORY

Course Objectives:

- To **simulate** various electric circuits using PSPICE/ MATLAB.
- To **gain** practical experience on electric circuits and verification of theorems.
- To impart hands on experience in measurement of circuit parameters, **study** of circuit characteristics and simulation of time response.
- To **expose** on the usage of CRO, power sources, function generator etc.

Course Outcomes

The Student will be able to:

- Become familiar with the basic circuit components and **know** how to connect them to make a real electrical circuit.
- Verify the laws and principles of electrical circuits; **understand** the relationships and differences between theory and practice.
- **Gain** practical experience related to electrical circuits, stimulate more interest and motivation for further studies of electrical circuits
- Carefully and thoroughly document and **analyze** experimental work.

List of Experiments

1. Verification of Mesh and Nodal analysis.
2. Verification of Super Position theorem.
3. Verification of Thevenin's & Norton's theorem.
4. Verification of Maximum Power Transfer theorem.
5. Verification of Reciprocity theorem.

6. Verification of Compensation theorem.
7. Verification of Milliman's theorem.
8. Determination of transient response of current in RL and RC circuits.
9. Determination of self, mutual inductances and coefficient of coupling.
10. Frequency response of Series and Parallel resonance circuits.
11. Determination of Z and Y parameters.
12. Determination Transmission and hybrid parameters.
13. Locus diagrams of RL & RC series circuit.

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B.Tech. : EEE	L	T	P	C
II Year -I Semester	0	0	3	1.5

ELECTRICAL MACHINES LABORATORY – I

Course Objectives:

- To **expose** the students to the operation of D.C. machines and transformers and give them experimental skill.
- To **conduct** testing and experimental procedures on different types of electrical machines.
- To **practice** different types of wiring and devices connections.
- To **analyze** the operation of electric machines under different loading conditions.

Course Outcomes:

The Student will be able to

- **Select** a suitable measuring instrument for a given application.
- **Analyze** the response of any electrical machine.
- **Conduct** experiments on DC Machines to find the characteristics.
- **Troubleshoot** the operation of an electrical machine.

List of Experiments

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.
2. Load test on DC shunt generator. Determination of characteristics.
3. Load test on DC series generator. Determination of characteristics.
4. Load test on DC compound generator. Determination of characteristics.
5. Hopkinson's test on DC shunt machines. Predetermination of efficiency.
6. Brake test on DC shunt motor. Determination of performance curves.

7. Swinburne's test and speed control of DC shunt motor. Predetermination of efficiencies.
8. Brake test on DC compound motor. Determination of performance curves.
9. Retardation test on DC shunt motor. Determination of losses at rated speed.
10. Separation of losses in DC shunt motor.
11. O.C. & S.C. Tests on Single phase Transformer.
12. Parallel operation of Single phase Transformer.
13. Scott connection of transformer.

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B.Tech. : EEE	L	T	P	C
II Year -I Semester	2	0	0	0

GENDERSENSITIZATION

Course Objectives:

At the end of the course,students will:

- Understand castesystem
- Learn women's work its politics an deconomics aware rebuildinglives.
- Understand about relationships,resposibilities and gender identities

Course outcomes: After completing the course the students will able to:

- Describes the basic structure of caste system in India and the major four categories to which all castes could be come out of ignorance and archaic indoctrination to make the world a better place for both men andwomen
- Have learnt to keep them safe and alive in the face of domesticviolence
- Learnt to maintain equality in gender .the student should have understand the responsibility of being good citizens overcoming socialevils

  Describes the basic structure of caste system in india and the major four categories to which all castes could be

Unit-I – Gender: Why should we study it?, Socialization: Making women, Making Men, Introduction, Preparing For Womanhood, Growing up male, First lessons in caste, Different masculinities.

Unit-II- Women"s Work: Its Politics and Economics,

Fact and fiction, Unrecognized and unaccounted work, Further reading:

Wages and conditions of work, Domestic Violence: Speaking Out, Is home a safe place?, When women unite [Film], Rebuilding lives, Further reading: New forums for justice.

Unit-III–Just Relationships: Being Together as Equals,

Mary kom and Onler, Love and acid just do not mix, Love letters, Mothers and fathers, Further Reading: Rosa Parks – The brave heart.

Text Books:

1. Towards a world of equals by A.SuneethaSusicTharu publication Telugu academy Hyderabad

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B.Tech. : EEE	L	T	P	C
II Year -II Semester	3	0	0	3

DIGITAL ELECTRONICS

Unit I: Logic Simplification

Introduction to number system, Review of Boolean Algebra and De Morgan's Theorem, SOP & POS forms, Canonical forms, Karnaugh maps up to 5 variables, Binary codes, Code Conversion.

Unit II: Combinational Logic Design

MSI devices like Comparator, Multiplexers, Encoder, Decoder, Driver &Multiplexed Display,

Half and Full Adders, Subtractors, Serial and Parallel Adders, BCD Adder, Barrel shifter and ALU

Unit III: Sequential Logic Design

Building blocks like S-R, D, T, JK and Master-Slave JK FF, Edge triggered FF, Ripple and Synchronous counters, Shift registers, Finite state machines, Design of synchronous FSM, Algorithmic State Machines charts. Designing synchronous circuits

Unit IV: Logic Families

TTL NAND gate, Specifications, Noise margin, Propagation delay, fan-in, fan-out, Tristate TTL, ECL, CMOS families and their interfacing, TTL logic family(7400, 74S00, 74LS00), ECL Logic family, comparison of logic families.

Unit V: Programmable logic Devices &Memories

Digital system design using ROM, PLA & PAL, comparison of ROM, PLA & PAL, RAM Memory, read and write operation timing diagram, Memory Decoding, memory Cell, Address Multiplexing, Bipolar RAM, SRAM, DRAM, Memory organization, Internal Structure, RAM Matrix at transistor level and Gatelevel.

Text Books:

1. R.P. Jain, “Modern digital Electronics”, Tata McGraw Hill, 4th edition,2009.
2. Douglas Perry, “VHDL”, Tata McGraw Hill, 4th edition,2002.

References Books:

1. W.H. Gothmann, “Digital Electronics- An introduction to theory andpractice”, PHI, 2nd edition ,2006.
2. D.V. Hall, “Digital Circuits and Systems”, Tata McGraw Hill,1989 CharlesRoth,“DigitalSystemDesignusingVHDL”,TataMcGrawHill2 ndedition 2012.

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B.Tech. : EEE	**L**	**T**	**P**	**C**
II Year -II Semester	**3**	**1**	**0**	**4**

ELECTRICAL MACHINES – II

Course Objectives:

To impart knowledge on the following topics

- Pulsating and revolving magnetic fields.
- Construction, operation, types, characteristics and torque equation of Induction Motors.
- Construction, principle of operation and performance of single phase induction motors and special machines.
- Construction and performance of salient and non – salient type synchronous generators.
- Operation and characteristics of synchronous motor.

Course Outcomes:

At the end of this course, students will demonstrate the ability to

- **Understand** the concepts of rotating magnetic fields.
- **Understand** the operation of AC machines.
- **Analyze** performance characteristics of AC machines.

UNIT 1: Pulsating and revolving magnetic fields: Constant magnetic field, pulsating magnetic field - alternating current in windings with spatial displacement, Magnetic field produced by a single winding - fixed current and alternating current.

Pulsating fields produced by spatially displaced windings, Windings spatially shifted by 90 degrees, Addition of pulsating magnetic fields, Three windings spatially shifted by 120 degrees (carrying three-phase balanced currents), revolving magnetic field.

UNIT 2: Induction Machines: Construction, Types (squirrel cage and slip-ring), Torque Slip Characteristics, Starting and Maximum Torque,

Equivalent circuit, Phasor Diagram, Losses and Efficiency. Effect of parameter variation on torque speed characteristics (variation of rotor and stator resistances, stator voltage, frequency). Methods of starting, braking and speed control for induction motors, Generator operation. Self-excitation, Doubly-Fed Induction Machines.

UNIT 3: Single-phase induction motors: Constructional features double revolving field theory.

Equivalent circuit, determination of parameters

Split-phase starting methods and applications. Special Motors: AC Series motor, Universal Motor, Shaded pole motor, Stepper motor

UNIT 4: Synchronous machines: Constructional features, cylindrical rotor synchronous machine - generated EMF, equivalent circuit and phasor diagram, armature reaction, synchronous impedance, voltage regulation.

Synchronization of Alternators with infinite bus – Methods of Synchronization- synchronizing power and torque –Parallel operation and load sharing – Numerical Problems –Effect of change of excitation and mechanical power input. Short circuit Analysis – determination of sub-transient, transient and steady statereactance's.

UNIT 5: Synchronous Motors: Construction and types of Synchronous Motors – Methods of Starting – Synchronous induction Motor. Variation of current and power factor with excitation control – phasor diagrams – V and Inverted V Curves.

Synchronous condenser – Applications - Problems - Mathematical analysis for power developed. Excitation and power circles – hunting and its suppression

Text Books:

1. A.E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013.
2. M. G. Say, "Performance and design of AC machines", CBS Publishers,2002.
3. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers,2011.

References Books:

1. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.
2. A. S. Langsdorf, "Alternating current machines", McGraw Hill Education, 1984.
3. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley &Sons,2007.

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B.Tech. : EEE	**L**	**T**	**P**	**C**
II Year -II Semester	**3**	**0**	**0**	**3**

POWER ELECTRONICS

Course Objectives:

To impart knowledge on the following Topics

- Different types of power semiconductor devices and their switching.
- Operation, characteristics and performance parameters of Thyristor rectifiers.
- Operation, switching techniques and basics topologies of DC-DC buck converters.
- Operation of Single phase voltage sourceconverter.
- Operation of Three Phase voltage sourceconverters.

Course Outcomes:

At the end of this course students will demonstrate the ability to

- **Understand** the differences between signal level and power level devices.
- **Analyze** controlled rectifier circuits.
- **Analyze** the operation of DC-DC choppers.
- **Analyze** the operation of voltage source inverters.

UNIT 1: Power switching devices: Diode, Thyristor, MOSFET, IGBT: I-V Characteristics; Firing circuit for thyristor. Voltage and current commutation of a thyristor; Gate drive circuits for MOSFET and IGBT.

UNIT 2: Thyristor rectifiers: Single-phase half-wave and full-wave rectifiers, Single- phase full-bridge Thyristor rectifier with R-load and highly inductive load.

Three-phase full-bridge thyristor rectifier with R-load and highly inductive load; Input current wave shape and power factor.

UNIT 3: DC-DC buck converter: Elementary chopper with an active switch and diode, concepts of duty ratio and average voltage.
Power circuit of a buck converter, analysis and waveforms at steady state, duty ratio control of output voltage.

UNIT 4: Single-phase voltage source inverter: Power circuit of single-phase voltage source inverter, switch states and instantaneous output voltage, square wave operation of the inverter.
Concept of average voltage over a switching cycle, bipolar sinusoidal modulation and unipolar sinusoidal modulation, modulation index and output voltage.
Three-phase voltage source inverter: Power circuit of a three-phase voltage source inverter.
Switch states, instantaneous output voltages, average output voltages over a sub- cycle, three-phase sinusoidal modulation.

UNIT 5:AC-AC Converters (AC Voltage Controllers): AC voltage controllers – Single phase two SCR's in anti-parallel – With R and RL loads – modes of operation of Triac
– Triac with R and RL loads – Derivation of RMS load voltage, current and power factor wave forms – Firing circuits -Numerical problems.
Frequency Changers (Cyclo-Converters): Cyclo converters – Single phase mid pointcyclo converters with Resistive and inductive load (Principle of operation only)
– Bridge configuration of single phase cyclo converter (Principle of operation only) – Waveforms.

TextBooks:

1. M. H. Rashid, "Power electronics: circuits, devices, and applications", Pearson Education India,2009.
2. N. Mohan and T. M. Undeland, "Power Electronics: Converters, Applications and Design", John Wiley & Sons,2007.

References Books:

1. R. W. Erickson and D. Maksimovic, "Fundamentals of Power Electronics", Springer Science & Business Media,2007.
2. L. Umanand, "Power Electronics: Essentials and Applications", Wiley India, 2009.

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B.Tech. : EEE	L	T	P	C
II Year -II Semester	3	0	0	3

POWER ELECTRONICS

Course Objectives

This course is intended to familiarize the students with the framework for the managers and leaders in understanding and making decisions related to planning & organizational structure, Operations management, Marketing management, Human resource Management.

Course Outcomes:

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

- **Evolve** a strategy for a business or service organization.
- **Planning** and types of organizational structures for a given context.
- Carry out production operations through Work study and SQC.
- Understand the Human resource concepts in detail.
- **Analyze** markets, competition and pricing strategies, Basics of rural marketing, virtual marketing, Logistics & Digital marketing.

UNIT I

Introduction to Business & Management

Types of Business – Sole proprietorship, partnership, Joint stock company, public enterprises and their types, Changing Economic environment, LPG.

Nature and Importance of Management, Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Douglas McGregor's Theory X and Theory Y, Systems Approach to Management. 7's frame work, Contingency theory.

UNIT II

Planning & Organizational Structures

Types of planning, nature of planning, levels of planning, planning process, Vision, mission, Objectives of organization.

Departmentation, Decentralization, Centralization and Recentralization. Types of Organization structures - Line organization, Line and staff organization, functional organization, Committee organization, Matrix organization, Cellular Organization, Virtual Organization, Team structure, lean and flat organization structure and their merits, demerits and suitability.

UNIT III

Operations Management & Project Management

Types of Plant Layout-Methods of production Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement-

Statistical Quality Control: $\bar{X}$ chart, R chart, c chart, pchart, Quality,

Project management (pert/cpm): Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), identifying critical path,.

UNIT IV

Human Resources Management

Concepts of HRM, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Promotion, Performance Appraisal, Grievance Handling and Welfare Administration.

Job Evaluation and Merit Rating, Bench marking, Compensation, Leadership, Leadership styles, Motivation, Groups & Teams.

UNIT V

Marketing Management

Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, New product development services.

Channels of distribution, Retailing and Basics of Rural Marketing, Digital Marketing, Virtual Marketing, Logistics & Supply chain

management.

REFERENCE BOOKS:

- Principles of Management by James A.F. Stoner, **Publisher:** Pearson Education; Second edition(2010)
- Kotler Philip & Keller Kevin Lane: MarketingManagement, **Publisher:** Pearson; 15 edition (15 September 2015)
- Production and Operations Management, **Publisher:** PHI; 3 edition (6 February2012)

  R. Panneerselvam (Author)

- L.S.Srinath: PERT/CPM,Affiliated East-West Press,2009.
- William J. Stevenson & Ceyhun Ozgur: Introduction to Management Science, TMH,2007.
- Rao, P. Subba. *Essentials of Human Resource Management and Industrial Relations: Text, Cases and Games*. Himalaya Publishing House,2010.
- Ramaswamy Namakumari: Marketing Management. **Publisher:** Mc Graw Hill India; 5 edition(2013)

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B.Tech. : EEE	L	T	P	C
II Year -II Semester	3	0	0	3

BIOLOGICAL SCIENCES

Course Objectives:

Students will be introduced to the basics of biology such as cell structure and functions, inheritance & evolution, systems of human life, basic concepts of genetics, and an introduction to microbiology

Course outcomes: After completing the course the students will able to

- Acquire the Knowledge of basicbiology
- Acquire the Knowledge of Human BiologicalSystems
- Acquire the knowledge ofNutrients
- Acquire Knowledge onMicroorganisms
- Acquire the knowledge geneexpression

UNIT - I:

Basic Biology : Introduction, Living organisms, Cell structure and Organelles, Organogenesis.

UNIT - II:

Human Anatomy: Systems of Life-Digestion, Respiration, Circulation, Excretion, Reproduction, and Nervous system.

UNIT - III:

Biochemistry: Diet and Nutrition- Macro (Carbohydrates, proteins, lipids) - and Micronutrients (vitamins),

Essential minerals and their role; deficiency symptoms; and their role; deficiencysymptoms.

UNIT - IV:

Microbiology: Micro organisms-Classification of Microorganisms, beneficial and harmful effects of Bacteria, Fungi and Viruses.

UNIT - V:

Genetics: Basic principles of Mendel, molecular genetics, structure and function of genes and chromosomes,
Transcription and Translation, gene expression and regulation

TEXT BOOKS:

1. P K Gupta ,"Elements of Biotechnology", RASTOGI Publications
2. Dr RC Dubey ,"Advanced Biotechnology", S Chand Publications.

REFERENCE BOOKS:

1. "Cell biology",RastogiPublications
2. Microbiology,PELCZAR
3. Biotechnology,U.sathyanarayana

J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY

UGCAUTONOMOUS

Bhaskar Nagar, Moinabad (M), RR Dist, Telangana-500075

B.Tech. : EEE	L	T	P	C
II Year -II Semester	0	0	2	1

DIGITAL ELECTRONICS LAB

List of Experiments:

TOVERIFYTHEFUNCTIONALITYof the following 74 series TTL ICs.

1. D Flip -Flop (74LS74) and JK Master-Slave Flip-Flop (74LS73}.
2. Decade counter (74LS90) and UP-Down Counter (74LS192).
3. Universal Shift registers- 74LS194/ 195. 4. 3-8decoder-74LS138.
5. 4 bit comparator 74LS85.
6. 8X1 Multiplexer-74151 and 2X4 demultiplexer-74155.
7. RAM (16X4) - 74189 (read and writeoperations).
8. Stack and queue implementation using RAM**,**74189.

Simulate the internal structure of the following Digital IC's using VHDL / VERILOG and verify the operations of the Digital IC's (Hardware) in the Laboratory

1. Logic Gates-74XX.
2. Half Adder, FullAdder 3. 3-8 Decoders-74138.
4. 8 x 1 Multiplexer-74X151
5. 2x4Demultiplexer-74X155
6. 4 bitComparator-74X85.
7. D Flip-Flop74X74.
8. Decadecounter-74X90.

For Software Simulation

1. ComputerSystems
2. LAN Connections(Optional)
3. OperatingSystems
4. VHDL/VERILOG
5. FPGAS/CPLDS (DownloadTools)

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B.Tech. : EEE	L	T	P	C
II Year -II Semester	0	0	3	1.5

ELECTRICAL MACHINES LABORATORY – II

Course Objectives:

To expose the students to the following:

- Operation of synchronous machines and induction motors and give them experimental skill.
- Operation of single phase transformer.
- Parallel operation of transformer.
- Measurement of Sequence impedance of 3-phasealternator.

Course Outcomes:

The Student will be able to

- **Calculate** the efficiency of the single phase transformer, three phase induction motor, and alternator.
- **Know** the parallel operation of single phase transformer. Efficiency of three phase alternator

List of Experiments

1. Separation of core losses of a single phase transformer
2. Sumpner's test on a pair of single phase transformers
3. Brake test on three phase Induction Motor.
4. No-load & Blocked rotor tests on three phase Induction motor Methods.
5. V and Inverted V curves of a three-phase synchronous motor.
6. Regulation of three-phase alternator by E.M.F & M.M.F methods
7. Equivalent Circuit of a single phase induction motor.
8. Determination of $X_d$and $X_q$of a salient pole synchronous machine.
9. Regulation of three-phase alternator by Z.P.F. and A.S.A methods.
10. Efficiency of a three-phase alternator

11. Measurement of sequence impedance of a three-phasealternator.

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B.Tech. : EEE	L	T	P	C
II Year -II Semester	0	0	3	1.5

POWER ELECTRONICS LABORATORY

Course Objectives:

- To **simulate** and design various gate firing circuits.
- To **familiarize** the students by introducing PSPICE and MULTISIM and help them to **simulate** and **analyze** different Converters.
- To **enable** the student to study and simulate various Chopper Circuits

Course Outcomes:

The Student will be able to

- **Desig**n and **conduct** simulation andexperiments.
- **Use** the techniques, skills and modern engineering tools necessary for engineering practice.
- **Identify, formulate** and sole engineering problems with simulation.
- **Simulate** characteristics of SCR, MOSFET, and IGBT.
- **Simulate** Gate firing circuits.
- **Simulate** Rectifier, Chopper, Inverter and AC Voltage Controller.

List of Experiments

1. Study of Characteristics of SCR, MOSFET &IGBT.
2. Gate firing circuits for SCR‘s.
3. Single Phase AC Voltage Controller with R and RL Loads.
4. Single Phase fully controlled bridge converter with R and RL loads.
5. Forced Commutation circuits (Class A, Class B, Class C, Class

D & Class E).

6. DC Jones chopper with R and RL Loads.
7. Single Phase Parallel, inverter with R and RL loads.
8. Single Phase Cyclo-converter with R and RL loads.
9. Single Phase Half controlled converter with R load.
10. Three Phase half controlled bridge converter with R- load.
11. Single Phase series inverter with R and RL loads.
12. Single Phase MC Murry Bed fort inverter.
13. Simulation of single-phase full converter using RLE loads and single-phase AC voltage controller using RLE loads.
14. Simulation of resonant pulse commutation circuit and Buck chopper.
15. Simulation of single phase Inverter with PWM control

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B.Tech. : EEE	L	T	P	C
II Year -II Semester	2	0	0	0

ENVIRONMENTAL SCIENCES

Course Objectives:

- To know the importance of Environment is a key to the futureof mankind.
- Global warming,the depletion of ozone layer and loss of biodiversity have made everyone aware of environmentalissues
- Study of environmental studies encourages students toexplore the social, aesthetic, ethical, scientific, and technical aspects of environmentalissues.
- we can apply modeling to understand the behavior make predictions for future and plan management in view ofchanging environmental conditions

Course outcomes: After completing the course the students will able to

- Understand the importance of natural resources and use them efficiently and knowing how to conservebiodiversity
- Imply environment plan in developing in any sort of environmental projects.
- Apply the environmental legislation in every walk of life and reserve the natural resources for future generations in sustainablemanner.

UNIT - I:

Ecosystems & Natural Resources, **Biodiversity:** Concept, Classification of Resources: Water resources, Land resources, land degradation, Forest resources, Mineral resources,

Energy resources. Concept of ecosystem, Classification of ecosystem, Functions of ecosystem. Biodiversity, Level, values, hotspots of biodiversity, Threats To Biodiversity, Conservation Of Biodiversity.

UNIT - II:

Global Environmental Problems And Global Efforts: Deforestation,Green house effect, Global Warming, Sea level rise, Ozone depletion. International conventions/protocols: green-belt- development, Concept of Green Building, Clean Development Mechanism(CDM).

Environmental Impact Assessment (EIA) And Environmental Management Plan: Definition of Impact, classification of impacts, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society, impact assessment methodologies. Environmental management plan (EMP).

UNIT - III:

Environmental Policy, Legislation, Rules And Regulations : Environmental Protection Act: Air (Prevention and control of pollution) Act-1981, Water (Prevention and control of pollution) Act-1974, Forest Conservation Act **.**

Towards Sustainable Future: Concept of Sustainable Development, Threats to Sustainability, Strategies for achieving Sustainable development, Environmental Ethics, Environmental Economics, Concept of Green Computing.

TEXT BOOKS:

1. TEXT BOOK OF ENVIRONMENTAL Science and Technology by M.Anji Reddy2007
2. Principles of Environmental Science and Engineering by P.VenugopalRao.
3. Introduction to Environmental Studies byK.Mukkanti
4. Text book of Environmental studies by Kaushik&Anubha kaushik

REFERENCE BOOKS:

1. **Tata McgrawHill :** Introduction to Environmental Studies by Benny Joseph

2. **Environmental Studies** by Erach Bharucha 2005, University Grants Commission, University Press