



# **NEW HORIZON COLLEGE OF ENGINEERING**



Permanently affiliated to VTU, approved by AICTE & ISO 9001:2008 certified

The Trust is a Recipient of Prestigious Rajyotsava State Award 2012 Conferred by the Government of Karnataka  
**Awarded Outstanding Technical Education Institute in Karnataka-2014**

Ring Road, Bellandur Post, Near Marathalli, Bangalore -560 103, INDIA, Fax: +91-80-2844 0770

**(An Autonomous Institution Affiliated to VTU)**

**Academic Year 2016-17**

**First and Second Semesters**

**Bachelor of Engineering (B.E)**

**(Common to all Branches)**

**Scheme and Syllabus**

## CONTENTS

1. First Semester- Credit Scheme for Chemistry and Physics Cycle
2. Second Semester- Credit Scheme for Chemistry and Physics Cycle

### CHEMISTRY CYCLE SYLLABUS

3. Engineering Mathematics I (common to both cycles)	6
4. Engineering Chemistry	9
5. Introduction to Programming with „C“	13
6. Computer Aided Engineering Drawing	18
7. Basic Electronics	21
8. Environmental Science and Awareness	24
9. Essential English	27

### PHYSICS CYCLE SYLLABUS

10. Engineering Mathematics II (Common to both cycles)	30
11. Engineering Physics	33
12. Elements of Mechanical Engineering	38
13. Elements of Civil Engineering	43
14. Basics of Electrical Engineering	46
15. Business communication	49
16. Constitution of India and professional ethics	51

### CREDIT SCHEME FOR FIRST SEMESTER B.E

FIRST SEMESTER- CHEMISTRY CYCLE												
Sl. No	Course Code	Course	BOS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	P	T	S			CIE	SEE	Total
1	15MAT11	Engineering Mathematics-I	MAT	4	0	1	0	5	6	50	50	100
2	15CHE12	Engineering Chemistry	CHE	3	1	0	1	5	5	75	75	150
3	15CSE13	Introduction to Programming with C	CSE	3	1	0	1	5	5	75	75	150
4	15MEE14	Computer Aided Engineering Drawing	MEE	2	1	1	0	4	6	50	50	100
5	15ECE15	Basic Electronics	ECE	3	0	1	0	4	5	50	50	100
6	16HSS161	Environmental Science and Awareness	HSS	2	0	0	0	2	2	50	50	100
7	15HSS171	Essential English	HSS	Mandatory Course				0	2	25	25	50
<b>Total</b>								25	31	375	375	750

FIRST SEMESTER- PHYSICS CYCLE												
Sl. No	Course Code	Course	BOS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	P	T	S			SEE	CIE	Total
1	15MAT11	Engineering Mathematics-1	MAT	4	0	1	0	5	6	50	50	100
2	15PHY12	Engineering Physics	PHY	3	1	0	1	5	5	75	75	150
3	15MEE13	Elements of Mechanical Engineering	MEE	3	1	0	1	5	5	75	75	150
4	15CIV14	Elements of Civil Engineering	CIV	3	0	1	0	4	5	50	50	100
5	15EEE15	Basics of Electrical Engineering	EEE	3	0	1	0	4	5	50	50	100
6	15HSS162	Business Communication	HSS	2	0	0	0	2	2	50	50	100
7	15HSS172	Constitution of India and Professional Ethics	HSS	Mandatory Course				0	2	25	25	50
<b>Total</b>								25	30	375	375	750

**CREDIT SCHEME FOR SECOND SEMESTER B.E (Common to all Branches)**

SECOND SEMESTER- CHEMISTRY CYCLE												
Sl. No	Course Code	Course	BOS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	P	T	S			CIE	SEE	Total
1	15MAT21	Engineering Mathematics-II	MAT	4	0	1	0	5	6	50	50	100
2	15CHE22	Engineering Chemistry	CHE	3	1	0	1	5	5	75	75	150
3	15CSE23	Introduction to Programming with C	CSE	3	1	0	1	5	5	75	75	150
4	15MEE24	Computer Aided Engineering Drawing	MEE	2	1	1	0	4	6	50	50	100
5	15ECE25	Basic Electronics	ECE	3	0	1	0	4	5	50	50	100
6	16HSS261	Environmental Science and Awareness	HSS	2	0	0	0	2	2	50	50	100
7	15HSS271	Essential English	HSS	Mandatory Course				0	2	25	25	50
<b>Total</b>								25	31	375	375	750

SECOND SEMESTER- PHYSICS CYCLE												
Sl. No	Course Code	Course	BOS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	P	T	S			SEE	CIE	Total
1	15MAT21	Engineering Mathematics -II	MAT	4	0	1	0	5	6	50	50	100
2	15PHY22	Engineering Physics	PHY	3	1	0	1	5	5	75	75	150
3	15MEE23	Elements of Mechanical Engineering	MEE	3	1	0	1	5	5	75	75	150
4	15CIV24	Elements of Civil Engineering	CIV	3	0	1	0	4	5	50	50	100
5	15EEE25	Basics of Electrical Engineering	EEE	3	0	1	0	4	5	50	50	100
6	15HSS262	Business Communication	HSS	2	0	0	0	2	2	50	50	100
7	15HSS272	Constitution of India and Professional Ethics	HSS	Mandatory Course				0	2	25	25	50
<b>Total</b>								25	30	375	375	750

# **CHEMISTRY CYCLE**

## ENGINEERING MATHEMATICS-I

**Course Code : 15MAT11**  
**L:P:T:S : 4:0:1:0**  
**Exam Hours : 03**

**Credits : 05**  
**CIEMarks : 50**  
**SEE Marks : 50**

**Course Outcomes: At the end of the Course, the Student will be able to do the following:**

C01	Learn the principles of engineering mathematics through calculus
C02	Find the extreme values of a function of two variables
C03	Understand the concept of vectors as a tool for solving engineering problems
C04	Understand the concept of Integration as a tool for solving engineering problems
C05	Develop the ability to construct mathematical models involving differential equations and interpret their solutions physically
C06	Apply ideas from linear algebra in solving systems of linear equations

**Mapping of Course Outcomes to Program Outcomes:**

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	3	3	3	-	-	-	-	-	-	2	-	3
C02	3	3	3	-	2	-	-	-	-	-	-	3
C03	3	3	3	2	-	-	-	-	-	-	-	3
C04	3	3	3	-	-	-	-	-	-	2	-	3
C05	3	3	3	2	2	-	-	-	-	2	-	3
C06	3	3	3	-	-	-	-	-	-	-	-	3

<b>Syllabus</b>			
<b>Module</b>	<b>Contents of the Module</b>	<b>Hour</b>	<b>COs</b>
<b>1</b>	<p><b>Solid Geometry</b> :Recapitulation of planes, straight lines. Right circular cone and right circular cylinder.</p> <p><b>Polar Curves:</b> - Angle between the radius vector and tangent, angle between two curves, Pedal equation for polar curves. Taylor's and Macluarin's theorems for function of one variable (statement only)- problems.</p>	<b>9</b>	<b>CO1</b>
<b>2</b>	<p><b>Partial derivatives:</b> Definition and simple problems, Euler's theorem – problems( No extended theorem), total derivatives, partial differentiation of composite functions, Jacobians - definition and problems.</p> <p><b>Applications:</b> Extreme values of functions of two variables.</p>	<b>9</b>	<b>CO2</b>

3	<p><b>Vector Calculus:-</b>Scalar and Vector point functions, Gradient, Divergence, Curl, Solenoidal and irrotational vector fields. Vector identities.</p> <p><b>Orthogonal curvilinear coordinates</b> -Orthogonality of cylindrical and spherical coordinate systems, expressions for vectors in cylindrical and spherical coordinate systems, problems (no proof).</p> <p><b>Applications:</b> Potential functions, line integral and work done.</p>	9	CO3
4	<p><b>Integral Calculus:</b> Reduction formulae <math>\int \sin^n x dx</math>, <math>\int \cos^n x dx</math> and <math>\int \sin^m x \cos^n x dx</math> - (m and n are positive integers), evaluation of these integrals with standard limits (0 to <math>\pi/2</math>) and problems.</p> <p><b>Curve Tracing</b> - tracing for Cartesian and polar curves : (i) Cassini (ii) Strophoid (iii) Cardioid (iv) Lemniscate and (v) three and four leaved rose.</p> <p><b>Differential Equations</b> :- Solution of first order and first degree differential equations – Linear and Bernoulli's differential equations.</p> <p><b>Applications-</b> Newton's law of cooling, flow of electricity, laws of decay, growth and mixing problem.</p>	9	CO4
5	<p><b>Linear Algebra:</b> Rank of a matrix by elementary transformations, solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and L-U decomposition method. Linear transformation, diagonalisation of a square matrix, Quadratic forms, reduction to Canonical form by orthogonal transformation</p>	9	CO5, CO6

**Text Books:**

1. Advanced Engineering Mathematics, Erwin Kreyszig, 10<sup>th</sup> edition, 2014, Wiley-India Publishers.
2. Higher Engineering Mathematics, B.S.Grewal, 43<sup>rd</sup> edition, 2014, Khanna Publishers .

**Reference Books:**

1. Advanced Modern Engineering Mathematics, Glyn James, 4<sup>th</sup> edition, 2015, Pearson Education.

2. Advanced Engineering Mathematics, Dennis G. Zill, Michael R. Cullen, 4<sup>th</sup> edition, 2015, Jones and Barlett Publishers Inc.
3. Engineering Mathematics, B. V. Ramana, 4<sup>th</sup> edition, 2005, Tata McGraw Hill Publications.
4. Engineering Mathematics, Anthony Craft, 4<sup>th</sup> edition, 2013, Pearson Education.

### **Assessment Pattern**

#### **1. CIE- Continuous Internal Evaluation (50 Marks)**

<b>Bloom's Category</b>	<b>Tests (30 Marks)</b>	<b>Assignments (10 Marks )</b>	<b>Quizzes (10 Marks )</b>
Remember	10	3	5
Understand	5	5	5
Apply	5	2	
Analyze	5		
Evaluate	5		
Create			

#### **2. SEE- Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Questions (50 Marks)</b>
Remember	10
Understand	10
Apply	20
Analyze	5
Evaluate	5
Create	



## ENGINEERING CHEMISTRY

**Course Code : 15CHE12/22**

**L:P:T:S : 3:1:0:1**

**Exam Hours : 03**

**Credits : 05**

**CIE Marks : 50+25**

**SEE Marks : 50+25**

**COURSE OUTCOMES:** At the end of the Course, the Student will be able to:

C01	Understand the chemistry behind engineering materials in various devices which are in the service of mankind.
C02	Analysis of existing problems and solutions with respect to engineering materials, energy production and other natural resources.
C03	Evaluate the various parameters that decide the performance and usage of materials and devices.
C04	Acquire technical competence in industries with respect to corrosion and metal finishing.
C05	Conception and implementation of alternative technologies and methods to exploit resources in an efficient way.
C06	Analyze chemical reactions according to stoichiometric methodology and to be able to predict the outcome of reactions and their applications.

### Mapping of Course Outcomes to Program Outcomes:

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	3	-	-	-	-	-	-	-	-	-	-	3
C02	3	3	-	-	-	-	-	-	-	-	-	3
C03	3	3	-	-	-	-	3	-	-	-	-	3
C04	3	3	-	-	-	-	-	-	-	-	-	3
C05	3	3	-	-	-	-	3	-	-	-	-	3
C06	3	-	-	-	-	-	3	-	-	-	-	3

Module	Contents of the Module	Hours	COs
1	<p><b>Electrochemistry and Battery Technology</b></p> <p><b>Electrochemistry:</b> Introduction- Derivation of Nernst equation for single electrode potential, working and construction of calomel and silver-silver chloride electrodes, applications. Measurement of standard electrode potential using calomel electrode. Electrolyte concentration cells, numerical problems, construction and working of glass electrode, determination of pH using glass electrode.</p> <p><b>Battery Technology:</b> Introduction, Classification- primary, secondary and reserve batteries, construction, working and applications of Lead – acid battery, Zn-Air and Li-ion batteries. Fuel cells: Definition, construction, working and applications of hydrogen-oxygen fuel cell.</p>	9	CO1, CO6

	<p>List of Experiments</p> <ol style="list-style-type: none"> <li>1. Potentiometric estimation of FAS</li> <li>2. Determination of pKa value of a weak acid using pH meter</li> </ol>	6	
2	<p><b>Corrosion and Metal Finishing</b></p> <p><b>Corrosion:</b> Introduction, electrochemical theory of corrosion, Factors affecting rate of corrosion, anodic and cathodic area, Nature of metal, Nature of corrosion product, pH. Types of corrosion –differential metal, differential aeration (water line and pitting) and stress corrosion. Corrosion control-Design and selection of materials, Protective coatings, organic coatings (brief introduction), inorganic coatings, Metal coatings-Galvanization and Tinning. Anodizing of aluminum and Phosphating,</p> <p><b>Metal Finishing</b> - Introduction, Technological importance. Principles governing electroplating – Polarisation, Decomposition potential and Over voltage. Electro plating –Introduction, factors influencing the nature of electro deposit - current density, plating bath (metal ion and electrolyte concentrations), Complexing agents, pH and throwing power. Electro plating of Chromium. Electroless plating – Introduction, Distinction between Electro plating and Electroless plating, Electroless plating of Copper and manufacture of PCB.</p>	9	CO4, CO6
	<p>List of Experiments</p> <ol style="list-style-type: none"> <li>1. Determination of percentage of iron in given sample of haematite ore solution.</li> <li>2. Determination of percentage of copper in brass using standard sodium thiosulphate Solution (Brass solution to be given)</li> <li>3. Determination of percentage of CaO in Cement solution using std EDTA solution.</li> <li>4. Colorimetric determination of copper/ Iron</li> </ol>	12	
3	<p><b>Chemical Energy Sources and Photovoltaic Cells</b></p> <p><b>Chemical Fuels:</b> Definition, classification, importance of hydrocarbon fuels, calorific value–Gross and Net calorific value. Determination of Calorific value of fuel using Bomb calorimeter-Numerical problems. Cracking – Fluidized catalytic cracking, reformation of petrol, Octane and Cetane Numbers. Gasoline knocking and mechanism, anti knocking agents, unleaded petrol, Power alcohol and Biodiesel.</p> <p><b>Photovoltaic cells:</b> Introduction, importance, construction and working of PV cells, advantages and disadvantages of PV cells. Production of solar grade silicon by union carbide process and purification of silicon by zone refining.</p>	8	CO2, CO3 & CO5
	<p>List of Experiments</p> <ol style="list-style-type: none"> <li>1. Determination of viscosity coefficient of a given liquid using Ostwald's Viscometer ( Density of the given liquid to be given)</li> </ol>	3	

4	<p><b>Phase rule and Water Technology</b></p> <p><b>Phase rule:</b> Statement of Gibb's phase rule and explanation of the terms involved, phase diagram of one component system-water system, condensed phase rule, phase diagram of two component system-eutectic, Pb-Ag system, application-desilverization of lead.</p> <p><b>Water Technology:</b> Boiler feed water, Boiler troubles with disadvantages – Scale and sludge formation, Priming and foaming, Boiler corrosion – Dissolved oxygen, Carbon dioxide and MgCl<sub>2</sub> and prevention. Determination of COD-Numerical problems on COD. Softening of water by ion exchange process, desalination of sea water by electro dialysis. Sewage treatment: Activated sludge process.</p>	9	CO <sub>2</sub> , CO <sub>5</sub> &CO <sub>6</sub>
	<p>List of Experiments</p> <ol style="list-style-type: none"> <li>1. Determination of total hardness of water sample by preparing std.EDTA solution</li> <li>2. Determination of chemical oxygen demand (COD ) of the given industrial waste sample</li> <li>3. Determination of total alkalinity of a given sample of water using standard Hydrochloric acid.</li> <li>4. Conductometric estimation of HCl and CH<sub>3</sub>COOH mixture using std.NaOH</li> <li>5. Estimation of sodium by flame photometry</li> </ol>	15	
5	<p><b>Polymers and Nanoscience</b></p> <p><b>Polymers-</b> Introduction, types of polymerization- addition and condensation. Free radical mechanism taking vinyl chloride as an example-Glass transition temperature, Factors influencing T<sub>g</sub>-Flexibility, intermolecular forces, molecular mass, branching, cross linking, significance of T<sub>g</sub>. Synthesis, properties and applications of PMMA, Teflon, Polymer composites –Introduction, synthesis, properties and applications of Kevlar fibre.</p> <p><b>Nanoscience:</b> Introduction, properties at nano scale (size dependant), synthesis-bottom up approach, precipitation technique, applications of nanomaterials - fullerenes, carbon nanotubes, nanowires, nanorods and biomedical (nanomedicine)</p>	9	CO <sub>1</sub> &CO <sub>2</sub>

### Text Books

1. Chemistry for Engineering Students, B. S. Jaiprakash, R. Venugopal, Shivakumaraiah and PushpaIyengar, 2015 Edition,SubhashPublications, Bangalore
2. Engineering Chemistry by R. V. Gadag and A. NityanandaShetty, , 3<sup>rd</sup> Edition, 2014 I K International Publishing House Pvt. Ltd., New Delhi.
3. A Text Book of Engineering Chemistry, Jain and Jain, 3<sup>rd</sup> Edition, 2014 Dhanpatrai Publications

### Reference Books

1. Engineering Chemistry by O. G. Palanna, Tata McGraw Hill Education Pvt. Ltd.
2. Engineering Chemistry by V R Kulkarni and K.Ramakrishna Reddy, 1<sup>st</sup> Edition, 2016, New Age International Publishers.
3. Corrosion Engineering by M. G. Fontana, Tata McGraw Hill Education Pvt. Ltd. New Delhi.
4. Wiley Engineering Chemistry, Wiley India Nanochemistry A Chemical Approach to Nanomaterials by G. A. Ozin and A. C. Arsenault.

## Assessment Pattern

### CIE- Continuous Internal Evaluation (50 Marks) (Theory)

Bloom's Category	Tests	Assignments	Quizzes	SSA
<b>Marks (out of 50)</b>	<b>30</b>	<b>5</b>	<b>5</b>	<b>10</b>
Remember	5	-	1	
Understand	15	2	1	3
Apply	5	2	2	3
Analyze	5	1	2	4
Evaluate				
Create				

### CIE- Continuous Internal Evaluation (25 Marks) (lab)

Bloom's Category	Performance (day to day)	Internal test
<b>Marks (out of 25)</b>	<b>15</b>	<b>10</b>
<b>Remember</b>	02	02
<b>Understand</b>	03	03
<b>Apply</b>	05	03
<b>Analyze</b>	05	02
<b>Evaluate</b>		
<b>Create</b>		

### SEE- Semester End Examination Theory (50 Marks)

Bloom's Category	SEE Theory (50)
Remember	10
Understand	20
Apply	10
Analyze	10
Evaluate	
Create	

### SEE- Semester End Examination Lab (25 Marks)

Bloom's Category	SEE Lab (25)
Remember	5
Understand	10
Apply	5
Analyze	5
Evaluate	
Create	

## INTRODUCTION TO PROGRAMMING WITH „C“

**Course Code : 15CSE13/23**

**L:P:T:S : 3:1:0:1**

**Exam Hours : 03**

**Credits: 05**

**CIE Marks : 50+25**

**SEE Marks : 50+25**

**Course Outcomes: Students shall demonstrate knowledge associated with:**

C01	Apply the fundamentals of problem-solving skills to solve real time problems.
C02	Apply the basic concepts of branching, looping statements of C Language in problem solving.
C03	Design and evaluate C programs based on different data types, decision structures, loops, arrays, strings and functions.
C04	Analyze the given application and choose appropriate structures, files, pointers and preprocessors
C05	Analyze the various searching and sorting algorithms.
C06	Categorize various data structures and their applications.

**Mapping of Course Outcomes to Program Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
C01	3	-	-	-	-	-	-	-	-	1	-	1	-	-
C02	3	-	-	-	3	-	-	-	3	-	-	-	3	3
C03	3	3	3	-	3	-	-	-	3	-	-	-	3	3
C04	3	3	3	-	3	-	-	-	3	-	-	-	3	3
C05	3	3	3	1	3	-	-	-	3	1	-	-	3	3
C06	3	3	-	-	-	-	-	-	-	1	-	1	3	3

## SYLLABUS

Module	Contents of the Module	Hours	COs
<b>1</b>	<b>Introduction to C Language:</b> Pseudocode solution to problem, Basic concepts of a C program, Declaration, Assignment & Print statement, Types of operators and expressions, Programming examples and exercise.	<b>6</b>	<b>CO1, CO2</b>
<b>2</b>	<b>Branching and Looping:</b> Twoway selection(if,if-else,nestedif-else, cascadedif-else),switchstatement,ternary operator?Goto,Loops(For,do-while, while)inC,breakandcontinue,programmingexamplesandexercises.	<b>8</b>	<b>CO2, CO3</b>
	<b>List of Experiments</b> 1. Design and develop a flowchart or an algorithm that takes three coefficients ( <i>a</i> , <i>b</i> , and <i>c</i> ) of a Quadratic equation ( $ax^2+bx+c=0$ ) as input and compute all possible roots. Implement a C program for the developed flowchart/algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages. 2. Design and develop an algorithm to find the <i>reverse</i> of an integer number <b>NUM</b> and check whether it is PALINDROME or NOT. Implement a C program for the developed algorithm that takes an integer number as input and output the reverse of the same with suitable messages. Ex: Num: <b>2014</b> , Reverse: <b>4102</b> , Not a Palindrome 3.a Design and develop a c program to implement simple calculator using switch case statement. b. Design and develop a C program to read a <i>year</i> as an input and find whether it is <i>leap year</i> or not. Also consider end of the centuries. 4. Draw the flowchart and Write a C Program to compute <b>Sin(x)</b> using Taylor series approximation given by $\text{Sin}(x) = x - (x^3/3!) + (x^5/5!) - (x^7/7!) + \dots$	<b>6</b>	
<b>3</b>	<b>Arrays and Strings:</b> Using anarray,UsingarrayswithFunctions,Multi-Dimensional arrays. String: Declaring, Initializing, Printing and reading strings, strings manipulation functions, strings input and output functions, arrays of strings, programming examples and Exercises. <b>Functions:</b> Functions in C, Argument Passing–call by value, Function and program structure, location of functions, void and parameter less Functions, Recursion,programmingexamplesandexercises.	<b>12</b>	
	<b>List of related Experiments</b> 5.a. Develop an algorithm, implement and execute a C program that reads <i>N</i> integer numbers and arrange them in ascending order using <b>Bubble Sort</b> . b. Develop, implement and execute a C program to search a Name in a list of name using <b>Linear searching</b> Technique.	<b>6</b>	14

	<p>6. Develop, implement and execute a C program that reads two matrices <math>A</math> (<math>m \times n</math>) and <math>B</math> (<math>p \times q</math>) and Compute product of matrices <math>A</math> and <math>B</math>. Read matrix <math>A</math> and matrix <math>B</math> in row major order and in column major order respectively. Print both the input matrices and resultant matrix with suitable headings and output should be in matrix format only. Program must check the compatibility of orders of the matrices for multiplication. Report appropriate message in case of incompatibility.</p> <p>7.a. Write and execute a C program that Implements string copy operation <b>STRCOPY</b> (<math>str1, str2</math>) that copies a string <math>str1</math> to another string <math>str2</math> without using library function.</p> <p>b. Read a <i>sentence</i> and print frequency of vowels and total count of consonants.</p> <p>8.a. Design and develop a C function <b>RightShift</b>(<math>x, n</math>) that takes two integers <math>x</math> and <math>n</math> as input and returns value of the integer <math>x</math> rotated to the right by <math>n</math> positions. Assume the integers are unsigned. Write a C program that invokes this function with different</p> <p>b. Draw the flowchart and write a <b>recursive C</b> function to find the factorial of a number, <math>n!</math>, defined by <math>fact(n)=1</math>, if <math>n=0</math>. Otherwise <math>fact(n) = n * fact(n-1)</math>. Using this function, write a C program to compute the binomial coefficient <math>r nC</math>. Tabulate the results for different values of <math>n</math> and <math>r</math> with suitable messages.</p>												
4	<p><b>Structures and File Management:</b> Basicofstructures,structuresand Functions,Arraysofstructures,structureDatatypes,typedefinition,Defining,opening andclosing offiles,Inputandoutputoperations,programmingexamplesandexercises</p> <p><b>List of Experiments</b></p> <p>9. Given two university information files “<b>studentname.txt</b>” and “<b>usn.txt</b>” that contains students Name and USN respectively. Write a C program to create a new file called “<b>output.txt</b>” and copy the content of files “<b>studentname.txt</b>” and “<b>usn.txt</b>” into output file in the sequence shown below. Display the contents of output file “<b>output.txt</b>” on to the screen.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Student Name</td> <td>USN</td> </tr> <tr> <td>Name 1</td> <td>USN1</td> </tr> <tr> <td>Name 2</td> <td>USN2</td> </tr> <tr> <td>....</td> <td>....</td> </tr> <tr> <td>....</td> <td>....</td> </tr> </table> <p>10. Write a C program to maintain a record of <math>n</math> student details using an array of structures with four fields (Roll number, Name, Marks, and Grade). Assume appropriate data type for each field. Print the marks of the student, given the student name as input.</p>	Student Name	USN	Name 1	USN1	Name 2	USN2	....	....	....	....	8	CO3, CO4
Student Name	USN												
Name 1	USN1												
Name 2	USN2												
....	....												
....	....												
5	<p><b>Pointers and Preprocessors:</b>Pointers andaddress,pointersandfunctions</p>	10	CO4,										

arguments, pointers and arrays, address arithmetic, character pointer and functions, pointerstopointer,Initializationof pointersarrays,Dynamicallocationsmethods, Introductionto Preprocessors,CompliercontrolDirectives,programmingexamplesand exercises. <b>IntroductiontoDataStructures:</b> Primitiveandnonprimitivedatatypes,Definitionand applications of Stacks , Queues, Linked Lists and Trees		<b>CO6</b>
<b>List of Experiments</b> 11. Write a C program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of <b>n</b> real numbers.	<b>3</b>	

### TEXT BOOKS:

1. BrainW.Kernighan and Dennis M.Richie: The C programming Language, 2<sup>nd</sup> Edition,PHI, 2012.
2. Jacqueline Jones& Keith Harrow: Problem Solving with C, 1<sup>st</sup>Edition, Pearson 2011.

### REFERENCEBOOKS:

1. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press2013.
2. RSBichkar, Programming with C, University Press,2012.
3. V Rajaraman :Computer Programming in C, PHI, 2013

**SELF STUDY:** Students shall study the evolution of various programming languages from 1970s till date and thereby understand the fundamental difference in features among various programming languages.

### Assessment Method:

#### CIE- Continuous Internal Evaluation (50 Marks,theory)

Bloom's Category	Tests	Assignments	Quizzes	Self Study
Marks ( out of 50)	30	5	5	10
Remember	-	-	-	
Understand	5	2	2.5	5
Apply	5	2	-	
Analyze	10	1	2.5	5
Evaluate	5	-	-	
Create	5	-	-	

#### CIE- Continuous Internal Evaluation for lab (25 Marks)

Bloom's Category	Tests	Assignments	Quizzes/Viva
Marks ( out of 25)	10	10	05



Remember	-	-	-
Understand	-	5	01
Apply	-	2	01
Analyze	5	3	01
Evaluate	-	-	-
Create	5	-	01

**SEE – Semester End Examination (50 Marks - Theory)**

<b>Bloom's Category</b>	<b>Tests(theory)</b>
Remember	-
Understand	10
Apply	10
Analyze	10
Evaluate	-
Create	20

**SEE – Semester End Examination (25 Marks - Lab)**

<b>Bloom's Category</b>	<b>Tests(theory)</b>
Remember	-
Understand	-
Apply	5
Analyze	10
Evaluate	-
Create	10

## COMPUTER AIDED ENGINEERING DRAWING

**Course Code : 15MEE14/24**

**L:P:T:S : 2:1:1:0**

**Exam Hours : 03**

**Credits : 04**

**CIEMarks : 50**

**SEE Marks : 50**

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

C01	Apply the knowledge of engineering fundamentals in order to understand about Dimensioning, conventions and standards related to working drawings and understand the theory of orthographic projections in order to communicate effectively with engineering community.
C02	Analyze the data in Organizing, demonstrating and arranging solids and planes in different positions using Modern tool usage with this contextual knowledge, complex problems can be solved.
C03	Improved visualization skills which can lead to the development of sketch into orthographic views further helps in modelling of complex engineering problems.
C04	By interpreting the given data, design or develop the 3D models in isometric view with the help of modern Engineering software tools.
C05	Engage in independent study as a member of a team and make an effective oral presentation or demonstration on topics related to the practical application and complex engineering problems using advanced mechanical systems or software..
C06	Understanding physical dimensions or specifications prior to executing complex engineering problems.

**Mapping of Course outcomes to Program outcomes:**

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	2	-	-	-	-	-	-	-	-	2	-	-
C02	2	-	2	-	1	-	-	-	-	-	-	-
C03	-	-	-	-	1	-	-	-	-	-	-	-
C04	-	-	-	2	1	-	-	-	-	-	-	-
C05	-	-	-	2	-	-	-	-	-	-	-	2
C06	-	-	2	-	-	-	-	-	-	-	-	-

<b>Module No</b>	<b>Contents of Module</b>	<b>Hrs</b>	<b>Cos</b>
<b>1</b>	<p><b>INTRODUCTION:</b></p> <p>Introduction to Computer Aided Sketching: Introduction, Drawing instruments and their uses, BIS Conventions, Lettering, Dimensioning, geometrical constructions and freehand practicing.</p> <p>Introduction to software, commands used for engineering drawing</p> <p><b>PROJECTION OF POINTS:</b> Introduction, Definitions - Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only)</p>	<b>10</b>	<b>CO1</b>
<b>2</b>	<p><b>PROJECTION OF STRAIGHT LINES</b></p> <p>True and apparent lengths, True and apparent inclinations to reference planes (No application problems)</p>	<b>10</b>	<b>CO1, CO2</b>
<b>3</b>	<p><b>PROJECTION OF PLANE SURFACES</b></p> <p>Introduction, Definitions–projections of plane surfaces–triangle, square, rectangle, rhombus, pentagon, hexagon and circle, planes in different positions by change of position method only (No problems on punched plates and composite plates)</p>	<b>10</b>	<b>CO1, CO3, CO6</b>
<b>4</b>	<p><b>PROJECTIONS OF SOLIDS</b></p> <p>Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions (No problems on octahedrons and combination solid).</p>	<b>20</b>	<b>CO4, CO6</b>
<b>5</b>	<p><b>ISOMETRIC PROJECTIONS (USING ISOMETRIC SCALE ONLY)</b></p> <p>Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, cut spheres and combination of solids (Maximum of three solids).</p>	<b>16</b>	<b>CO5, CO6 CO6</b>

**TEXT BOOKS:**

- 1. Engineering Drawing** - N.D. Bhatt & V.M. Panchal, 48th edition, 2005-Charotar Publishing House, Gujarat
- 2. Computer Aided Engineering Drawing** - K. R. Gopalakrishna, Subash Publishers, Bangalore , 2015, ISBN-13: 9789383214204

**REFERENCE BOOKS:**

- 1. A Primer on Computer aided Engineering drawing – 2006**, published by VTU, Belgaum.
- 2. Fundamentals of Engineering drawing with an Introduction to Interactive Computer Graphics for Design and Production** – Luzadder Warren J., Duff John M., Eastern Economy Edition, 2005 – Prentice– Hall of India Pvt. Ltd., New Delhi.

**Assessment Pattern****CIE: Continuous Internal Evaluation (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>	<b>Assignments</b>	<b>Surprise</b>
Marks (out of 50)	<b>30</b>	<b>10</b>	<b>10</b>
Remember	2	1	1
Understand	6	2	2
Apply	7	2	2
Analyze	7	2	2
Evaluate	2	1	1
Create	6	2	2

**SEE: Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>
Remember	4
Understand	10
Apply	11
Analyze	11
Evaluate	4
Create	10

## BASIC ELECTRONICS

**Course Code : 15ECE15/25**  
**L:P:T:S : 3:0:1:0**  
**Exam Hours : 03**

**Credits : 04**  
**CIE Marks : 50**  
**SEE Marks : 50**

**Course Outcomes: At the end of the Course, the Student will be able to:**

C01	Use Boolean algebra concepts to implement combinational and sequential circuits
C02	Identify the diode's usage as rectifier, and Zener diode's usage as voltage regulator
C03	Understand the basic characteristics of BJT and MOSFET
C04	Analyze the working of BJT Amplifier circuits
C05	Illustrate the various applications of op-amp
C06	Describe the architecture of Microprocessors and Microcontrollers

**Mapping of Course Outcomes to Graduate Attributes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	2	2	-	-	-	-	-	-	-	-	-
C02	3	-	-	-	-	-	-	-	-	-	-	-
C03	3	-	-	-	-	-	-	-	-	-	-	-
C04	3	2	2	-	-	-	-	-	-	-	-	-
C05	3	-	-	-	-	-	-	-	-	-	-	-
C06	3	-	-	-	-	-	-	-	-	-	-	-

### SYLLABUS

Sl no	Contents of Module	Hrs	COs
<b>1</b>	<b>Digital Electronics:</b> Switching and Logic Levels, Digital Waveforms, Number Systems (Decimal, Binary, Hexadecimal, Octal), Conversion from one number system to other, Complement of Binary Numbers, Boolean Algebra Theorems, De Morgan's theorem, Logic gates, Digital Circuits, Algebraic	<b>9</b>	<b>CO1</b>

	Simplification , NAND and NOR Implementation, Half Adder, Full Adder, Encoder, Decoder, Latch, Flip-Flop, Registers.		
2	<p><b>Semiconductor Diodes and Applications:</b> P-N Junction diode – its principle, characteristics and parameters, Applications (Half-Wave Rectifier, Two-Diode Full Wave Rectifier, Bridge Rectifier), Types of diodes (Zener diode, LED, Photo diode), Zener diode as voltage regulator.</p> <p><b>Bipolar Junction Transistor:</b> BJT Operation, BJT Voltages and Currents, Common Emitter Characteristics, Numerical examples as applicable.</p>	9	CO2, CO3
3	<p><b>BJT Biasing:</b> DC load line, Need for biasing, Voltage divider bias, Numerical examples as applicable.</p> <p><b>Amplifiers:</b> BJT amplification – BJT as a voltage and current amplifier, voltage gain, current gain, single stage CE amplifier, phase reversal, effect of coupling and bypass capacitors.</p> <p><b>MOSFET:</b> Introduction to MOSFET Theory, operation and characteristics.</p> <p><b>Filters:</b> Introduction, Low pass, high pass, band pass and band stop filters.</p>	9	CO4
4	<p><b>Operational Amplifier &amp; its Applications:</b> Characteristics (Ideal Op-amp, Practical Op-amp), Inverting and Non-inverting Amplifier, Voltage follower, Summing Amplifier and Subtractor, Numerical examples as applicable.</p> <p><b>Oscillators:</b> Basic feedback theory, Positive and Negative feedback, Concept of Stability, Introduction to Oscillators, Crystal oscillator.</p> <p><b>Communication System:</b> Principles of Communication System, Need for Modulation, AM and FM Modulation concept.</p>	9	CO5
5	<p><b>Microprocessors and Microcontrollers:</b> Introduction to Microprocessors, General operation of Microprocessors, 8085 Microprocessor architecture and working principle, Introduction to assembly language programming, Introduction to Microcontrollers, 8051 Microcontroller architecture and operation, Comparison between Microprocessors and Microcontrollers.</p>	9	CO6

**Case study:**

Mandatory case study on an Electronic system specifying its block diagram and operation to be submitted as an assignment.

**Text Books:**

1. Electronic Devices and Circuits, David. A. Bell, 5<sup>th</sup> Edition, 2008, Oxford University Press.
2. Digital Logic and Computer Design, M. Morris Mano, 5<sup>th</sup> edition, 2002, PHI.

**Reference Books:**

1. Op-amps and linear integrated circuits, Ramakant A. Gayakwad, 4<sup>th</sup> edition, 2000, Prentice Hall.
2. Electronic communication systems, Wayne Tomasi, 5<sup>th</sup> edition, 2001, Pearson education.
3. Electronic Principles, Albert Malvino and David Bates, 8<sup>th</sup> edition, 2015, McGraw-Hill.
4. Electronic Devices and Circuit Theory, Robert L. Boylestad and Louis Nashelsky, 10<sup>th</sup> Edition, 2008, Pearson Education / PHI.
5. Microprocessor Architecture, Programming and Applications with 8085, Ramesh Gaonkar, 6<sup>th</sup> Edition, 2013, Prentice Hall.
6. The 8051 Microcontroller and Embedded Systems using Assembly and C, Muhammad Ali Mazidi, 2<sup>nd</sup> Edition, 2011, Pearson.

**Assessment Pattern****CIE- Continuous Internal Evaluation (50 Marks)**

Bloom's Category	Tests	Assignments	Quizzes
<b>Marks (out of 50)</b>	<b>30</b>	<b>10</b>	<b>10</b>
Remember	10		
Understand	10	5	
Apply	10	5	5
Analyze			5
Evaluate			
Create			

**Note:** Any particular electronic system can be considered as case-study for a team of students, and the teams are required to present the system's basic working principles to the class. This work can be considered as one of the assignments, which can be evaluated for 5 marks.

**SEE- Semester End Examination (50 Marks)**

Bloom's Category	Tests
Remember	20
Understand	15
Apply	10
Analyze	5
Evaluate	
Create	

## ENVIRONMENTAL SCIENCE AND AWARENESS

**Course Code : 16HSS161**

**Credits : 02**

**L:P:T:S : 2:0:0:0**

**CIE Marks : 50**

**Exam Hours : 02 Hours**

**SEE Marks : 50**

**Course Outcomes: At the end of the Course, the student will be able to:**

C01	Understand the concepts of environment, ecology, ecosystem and impact of human activities
C02	Gain knowledge on natural resources and concept of sustainable development
C03	Understand the causes, effects and control measures of pollution and also its impacts on agriculture, housing and transportation
C04	Deduce various environmental issues
C05	Understand the basic concepts of energy resources
C06	Understand significance of environmental acts, amendments, ethics and role of Government

**Mapping of Course Outcomes to Program Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
C01	3	-	-	-	-	-	3	-	-	-	-	-	-	-
C02	3	-	-	-	-	-	3	-	-	-	-	-	-	-
C03	3	2	-	2	-	-	3	-	-	-	-	-	-	-
C04	3	2	-	2	-	-	3	-	-	-	-	-	-	-
C05	3	-	-	-	-	-	3	-	-	-	-	-	-	-
C06	3	-	-	-	-	-	3	1	-	-	-	-	-	-



Module No	Content of Module	Hrs	COs
1	<b>Introduction to Environment and Ecology</b>	05	CO1
	Environment - Components of Environment, Scope and importance of Environmental studies, Ecology & Ecosystem: Types & Structure of Ecosystem, balanced ecosystem.		
2	<b>Natural Resources</b>	04	CO2
	Water resources – Availability & Quality aspects, conflicts over water, Water borne diseases; Mineral resources, Forest resources Concept of sustainable development		
3	<b>Environmental Pollution and Human activities and impacts</b>	04	CO1, CO3 & CO4
	Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Land Pollution and Noise pollution.  Effects and impacts on agriculture, housing and transportation		
4	<b>Energy resources</b>	04	CO5
	Basic concepts of energy resources, creating awareness about energy resources, Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas, Fossil Fuels, Hydrogen as an alternative energy source.		
5	<b>Environmental Acts and Central Government Projects</b>	05	CO4 & CO6
	Environmental Acts and amendments, environmental ethics, awareness about environmental protection, Role of government: Swatch Bharat Abhiyan, National Mission for Clean Ganga (NMCG), River rejuvenation, Role of Nongovernmental Organizations (NGOs), Global warming and climate change.		

**Text Books:**

1. Environmental Studies by Dr. R. Geetha Balakrishnan, S.M. Publication, Bangalore, 2007 Edition.
2. Environmental Studies – From Crisis to Cure by R Rajagopalan, Oxford University Press, 2011 Edition (ISBN-9780198072089).

**Reference Books:**

1. Ecology, Environment & Pollution by Dr. A. Balasubramanian, Indira Publishers, Mysore.
2. Environmental Science and Engineering by P. Venugopala, Prentice Hall of India Pvt. Ltd, New Delhi, 2012 Edition (ISBN- 978-81-203-2893-8).
3. Environmental Science- Working with the earth by G Taylor Miller Jr, Brooks Cole Thompson Publications, 10<sup>th</sup> Edition (ISBN-10: 0534424082).
4. Elements of Environmental Science and Engineering by P. Meenakshi, Prentice Hall of India Pvt. Ltd, 2005 Edition (ISBN- 8120327748, 9788120327740).

### **CIE- Continuous Internal Evaluation (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>	<b>Assignments</b>	<b>Presentation</b>
<b>Marks ( out of 50)</b>	20	15	15
Remember	05	5	5
Understand	10	10	5
Apply	05	0	5
Analyze	0	0	0
Evaluate	0	0	0
Create	0	0	0

### **SEE – Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>
Remember	20
Understand	25
Apply	5
Analyze	0
Evaluate	0
Create	0

### **Percentage Evaluation of Various Bloom's levels**

<b>Bloom's Category</b>	<b>CIE</b>	<b>SEE</b>	<b>TOTAL</b>	<b>%</b>
Remember	15	20	35	35
Understand	25	25	50	50
Apply	10	05	15	15
Analyze	0	0	0	0
Evaluate	0	0	0	0
Create	0	0	0	0
<b>TOTAL</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>100</b>

## ESSENTIAL ENGLISH (Mandatory Course)

**Course Code : 15HSS171/271**  
**L:P:T:S : 2:0:0:0**  
**Exam Hours : 02**

**Credits 0**  
**CIEMarks 25**  
**SEE Marks 50**

**Course Outcomes: At the end of the Course, the Student will be able to:**

C01	Demonstrate command of the conventions of standard English grammar and usage when writing and speaking
C02	Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing
C03	Use of language and its conventions when writing and speaking
C04	To construct present, past and future verb forms
C05	To make use of comparatives and superlatives
C06	Write essays and creative writings considered appropriate for the college level in a variety of rhetorical modes.

### Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	-	-	-	-	-	-	-	2	-	3	-	-
C02	-	-	-	-	-	-	-	2	-	3	-	-
C03	-	-	-	-	-	-	-	2	-	3	-	-
C04	-	-	-	-	-	-	-	2	-	3	-	-
C05	-	-	-	-	-	-	-	2	-	3	-	-
C06	-	-	-	-	-	-	-	2	-	3	-	-

### SYLLABUS

Module	Contents of the Module	Hours	COs
<b>1</b>	Introduction to English Grammar ,Importance of Grammar Parts of Speech, Usage of preposition, Articles, Punctuation	<b>5</b>	<b>CO1, CO2 CO5</b>
<b>2</b>	Tenses and Degrees of Comparison, Active and Passive Voice, Vocabulary Building	<b>5</b>	<b>CO4</b>
<b>3</b>	Idioms and Phrases, Direct and Indirect Speech, Vocabulary usage, Homonyms, Homophones, Spelling, One word substitute	<b>4</b>	<b>CO2</b>
<b>4</b>	Subject verb agreement, Common errors in English Collocations	<b>4</b>	<b>CO2, CO4</b>
<b>5</b>	Essay Writing, Creative Writing	<b>4</b>	<b>CO3, CO6</b>

### Text Book:

1. Grammar Practice Activities- Penny Ur, Cambridge University Press
2. Grammar Builder Level 1 to Level 5 Paperback – Import, 10 Mar 2005 by Adibah Amin (Author), Rosemary Eravelly (Author), Farida J Ibrahim(Author), Cambridge University

Press

**Reference Books:**

1. Wren, P.C.; Martin, H.; PrasadaRao, N.D.V. (1973–2010). High School English Grammar & Composition. New Delhi: S. Chand. ISBN 81-219- 2197-X.

2. Wren, P.C.; Martin, H., A Final Course of Grammar & Composition, S Chand.

**Assessment Method:**

**CIE- Continuous Internal Evaluation (25 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>
<b>Marks (out of 25)</b>	<b>25</b>
Remember	15
Understand	05
Apply	05
Analyze	---
Evaluate	---
Create	---

**SEE- Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>
Remember	30
Understand	10
Apply	10
Analyze	---
Evaluate	---
Create	---

# **PHYSICS CYCLE**

## ENGINEERING MATHEMATICS-II

**Course Code : 15MAT21**

**L:P:T:S : 4:0:1:0**

**Exam Hours : 03**

**Credits 05**

**CIE Marks 50**

**SEE Marks 50**

**Course Outcomes: At the end of the Course, the Student will be able to do the following:**

C01	Understand higher order linear differential equations to physical problems
C02	Articulate the real world situations by partial differential equations
C03	Acquire the concepts of multiple integrals over regions and special functions
C04	Cognize the basic concepts of Laplace transform to apply real world problems
C05	Solve initial and boundary value problems using Laplace transform method
C06	Able to find response of the system using Laplace transform

**Mapping of Course Outcomes to Program Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	3	3	3	3	-	-	-	-	3	-	3
C02	3	3	3	3	3	-	-	-	-	3	-	-
C03	3	3	3	3	3	-	-	-	-	-	-	-
C04	3	3	3	3	3	-	-	-	-	3	-	3
C05	3	3	3	3	3	-	-	-	1	-	-	-
C06	3	3	3	3	3	-	-	-	1	-	-	-

Syllabus			
Module	Contents of the Module	Hour	COs
<b>1</b>	<b>Linear differential equations of second and higher order:</b> Solutions of second and higher order differential equations, solutions of simultaneous differential equations of first order. Solution of Cauchy's and Legendre's linear differential equations and variation of parameters method	<b>9</b>	<b>CO1</b>
<b>2</b>	<b>Partial Differential equations:</b> Formation of PDE by eliminating arbitrary constants and functions, Solution of non-homogeneous PDE by direct integration, and homogeneous PDE involving derivative with respect to one independent variable only. Solution of homogeneous linear P.D.E with constant coefficients.  <b>Applications:-</b> Stretched string, heat flow. Derivation of one dimensional heat and wave equations and Solutions of heat, Laplace and wave equations by variable separable method.	<b>9</b>	<b>CO2</b>

3	<p><b>Integral Calculus:</b> Double and triple integrals, evaluation of double integrals by changing the order of integration and changing into polar coordinates. Beta and Gamma functions, definitions, Relation between beta and gamma functions and simple problems.</p> <p><b>Application:</b> Application of double and triple integrals to find area, volume and volume of revolution.</p>	9	CO3
4	<p><b>Laplace Transform :</b>Definition and Laplace transforms of elementary functions. Properties of Laplace transforms (without proof), periodic functions, unit-step function and Impulse function – problems. Inverse Laplace Transform - problems, initial and final value theorem.</p>	9	CO4, CO5
5	<p><b>Applications of Laplace Transform :</b>Convolution theorem, solution of linear differential equations and LCR Circuit. Matrix exponential, finding matrix exponential for second order homogeneous and non-homogeneous system by Laplace transform method &amp; spectral form of second order system.</p>	9	CO5, CO6

**Text Books:**

1. Advanced Engineering Mathematics, Erwin Kreyszig, 10<sup>th</sup> edition, 2014, Wiley-India publishers.
2. Higher Engineering Mathematics, B.S.Grewal, 43<sup>rd</sup> edition, 2014, Khanna Publishers .

**Reference Books:**

1. Advanced Modern Engineering Mathematics, Glyn James, 4<sup>th</sup> edition, 2015, Pearson Education.
2. Advanced Engineering Mathematics, Dennis G. Zill, Michael R. Cullen, 4<sup>th</sup> edition, 2015, Jones and Barlett Publishers Inc.
3. Engineering Mathematics, B. V. Ramana, 4<sup>th</sup> edition, 2005, Tata McGraw Hill Publications.
4. Engineering Mathematics, Anthony Craft, 4<sup>th</sup> edition, 2013, Pearson Education.

**Assessment Pattern****CIE- Continuous Internal Evaluation (50 Marks)**

<b>Bloom's Category</b>	<b>Tests (30 Marks)</b>	<b>Assignments (10 Marks)</b>	<b>Quizzes (10 Marks)</b>
Remember	10	3	5
Understand	5	5	5
Apply	5	2	-
Analyze	5	-	-
Evaluate	5	-	-
Create	-	-	-

**SEE- Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Questions (50 Marks)</b>
Remember	10
Understand	10
Apply	20
Analyze	5
Evaluate	5
Create	



## ENGINEERING PHYSICS

**Course Code : 15PHY12/22**

**L:P:T:S : 3:1:0:1**

**Exam Hours : 03**

**Credits : 05**

**CIE Marks : 50+25**

**SEE Marks : 50+25**

**Course Outcomes: At the end of the Course, the Student will be able to:**

<b>C01</b>	Gather knowledge about modern scientific phenomena
<b>C02</b>	Acquire the ability to analyze the engineering concepts based on fundamental physical concepts.
<b>C03</b>	Possess the ability to analyze, formulate and solve problems
<b>C04</b>	Apply the laws of physics for better understanding of materials and their properties for various applications.
<b>C05</b>	Understand the Structure - Property relationship in the domain of material science and underlying its importance in field of Nanotechnology
<b>C06</b>	Utilize the scientific method and demonstrate competency with experimental methods to verify concepts related to content knowledge.

**Mapping of Course Outcomes to Program Outcomes:**

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	3	2	-	-	-	-	-	-	2	-	-	1
C02	3	2	-	-	-	-	-	-	2	-	-	1
C03	3	2	-	-	-	-	-	-	2	-	-	1
C04	3	2	-	-	-	-	-	-	2	-	-	1
C05	3	2	2	-	-	-	-	-	2	-	-	1
C06	3	2	2	-	-	-	-	-	2	-	-	1

Module	Contents of the Module	Hours	COs
1	<p><b>Lasers:</b></p> <p>Introduction, Basic concepts (absorption, spontaneous emission and Stimulated emission) Einstein coefficients and their relations, Population inversion, Lasing action, - Characteristics of Lasers Working principle, components, construction and working of CO<sub>2</sub> laser.</p> <p><b>Fiber Optics:</b></p> <p>Introduction, Basic structure of optical fiber, Principle of optical fiber - Acceptance angle, acceptance cone and Numerical aperture - Types of optical fibers (Material, Refractive index and Mode guiding) - V-number, Attenuation ,Point to point communication of optical fibers, problems.</p>	9	CO1, CO2, CO3, CO6
	<p><b>List of Experiments</b></p> <p>1. <b>Laser Diffraction</b> : To determine the wavelength of Laser using grating</p>	3	
2	<p><b>Magnetic Properties:</b></p> <p>Origin of magnetic moment - Classification of Magnetic materials (dia, para, ferro) - Ferromagnetic – Domain theory - B-H curve - Soft and hard magnetic materials - applications.</p> <p><b>Dielectric Properties:</b> Dielectric constant - polarization –types, Polarizability - Internal field (Expression for One dimensional solid) Clausius -Mossotti equation( Derivation) – Temperature and frequency dependence of Polarizability, Dielectric loss - Piezoelectrics, ferroelectrics -problems.</p>	9	CO1 CO2 CO3 CO4 CO6
	<p><b>List of Experiments</b></p> <p>2. <b>B - H Curve:</b> To draw the B – H curve and to determine the coercivity and retentively of the given ferro magnetic materia</p> <p>3. <b>Dielectric constant:</b> To determine the dielectric constant of given dielectric by charge and discharge method</p>	6	
3	<p><b>Modern Physics :</b></p> <p>Introduction, dual nature of light, dual nature of matter, de-Broglie hypothesis, matter waves and their characteristic properties , Phase velocity, Group velocity (concept and derivation), Qualitative discussion of interrelationship between phase velocity and group velocity, relation between group velocity and particle velocity, expression for de-Broglie wavelength in terms of Group Velocity. Problems</p> <p><b>Quantum Mechanics:</b></p> <p>Heisenberg’s uncertainty principle – definition, application and significance, derivation of Schrodinger Time Independent wave</p>	9	CO1 CO2 CO3 CO6

	equation in 1 dimension – Eigen values and Eigen functions, Physical significance of wave function - Particle in a box (one dimensional), problems		
	<b>List of related Experiments</b> <b>4.</b> Determination of Planck 's constant using LED <b>5.</b> Stefan's Law: To verify Stefan's Law	<b>6</b>	
<b>4</b>	<b>Conductors:</b> Qualitative discussion of Classical free electron theory – concept of drift velocity, relaxation time-expression for electrical conductivity (no derivation) – mobility- drawbacks- Quantum free electron theory – Fermi- factor and its dependence on Energy at various temperatures – success of quantum free electron theory. Problems. <b>Semiconductor Physics:</b> Introduction, conductivity in an intrinsic semiconductor-carrier concentration (only expression – no derivation) , Law of mass action and expression for position of Fermi level in Intrinsic semiconductors(derivation) –Hall Effect, Hall coefficient (derivation) –applications .	<b>9</b>	<b>CO1 CO3 CO4 CO6</b>
	<b>List of Experiments</b> <b>6.</b> Fermi Energy: To determine the Fermi energy of copper. <b>7.</b> Photodiode Characteristics: To study the V-I characteristics of photo diode for different light intensity in reverse bias condition <b>8.</b> Zener Diode Characteristics: To study the V-I characteristics of Zener diode and the reverse Zener break down voltage <b>9.</b> Transistor Characteristics: To study the input and output characteristics of a Transistor in CE configuration and find the gain factor. <b>10.</b> Energy Gap: To find the energy gap of a given thermistor. <b>11.</b> Frequency Response of LCR circuit – Series & parallel	<b>18</b>	
<b>5</b>	<b>Crystal structure:</b> Review, Unit cell, Bravais lattice, Seven crystal systems, Miller indices, Interplanar distance-derivation(for a cubic system), structure of NaCl, Braggs law, Braggs X-ray spectrometer, Problems <b>NanoScience:</b> Introduction, Density of states in 0d, 1d,2d and 3d system ,Moore"s law, synthesis: Top-down, Bottom – Up ( Sol – Gel) , Carbon nano tubes- synthesis, properties and applications, SEM.	<b>9</b>	<b>CO1 CO3 CO4 CO5 CO6</b>
	<b>List of Experiments</b> <b>12.</b> Determination of lattice parameters using Powder Diffraction pattern.	<b>3</b>	

**Self Study:**

Student shall be given topics based on which they can create working model, lab view demonstration, charts, power point presentations. The topics shall be an extended part of the syllabus.

**Text Book**

- 1.Engineering Physics, S.P.Basavaraju, 2016 Edition, 2015, Subhas Stores
- 2.A Textbook of Engineering Physics, Gaur and Gupta, 8<sup>th</sup> Edition, 2011, DhanpatRai Publishers

**Reference Books**

- 1.Engineering Physics, B. K. Pandey and S. Chaturvedi,1<sup>st</sup> edition, 2012, Cengage Publication
- 2.Solid State Physics, C Kittel, 8<sup>th</sup> Edition, 2012, Wiley International
- 3.Concepts of Modern Physics, Arthur Beiser, 6<sup>th</sup> Edition, 2009, Tata McGraw Hill,
- 4.A Textbook of Solid State Physics, S.O. Pillai, 6th Edition, 2010,New Age International,

**Assessment Pattern****CIE- Continuous Internal Evaluation Theory (50 Marks)**

<b>Bloom"s Category</b>	<b>Tests</b>	<b>Assignments</b>	<b>Quizzes</b>	<b>Self Study</b>
<b>Marks (out of 50)</b>	<b>30</b>	<b>05</b>	<b>05</b>	<b>10</b>
Remember	10		02	
Understand	10		02	
Apply	10	03	01	03
Analyze		02		03
Evaluate				
Create				04

**CIE- Continuous Internal Evaluation Lab(25 Marks)**

<b>Bloom"s Category</b>	<b>Performance (day to day)</b>	<b>Internal test</b>
<b>Marks (out of 25)</b>	<b>15</b>	<b>10</b>
Remember	02	02
Understand	03	03
Apply	05	03
Analyze	05	02
Evaluate		
Create		

**SEE- Semester End Examination Theory (50 Marks)**

<b>Bloom's Category</b>	<b>Marks Theory(50)</b>
Remember	10
Understand	20
Apply	10
Analyze	10
Evaluate	
Create	

**SEE- Semester End Examination Lab(25 Marks)**

<b>Bloom's Category</b>	<b>Lab(25)</b>
Remember	05
Understand	10
Apply	05
Analyze	03
Evaluate	02
Create	

## ELEMENTS OF MECHANICAL ENGINEERING

**Course Code : 15MEE13/23**

**L:P:T:S : 3:1:0:1**

**Exam Hours : 03**

**Credits : 5**

**CIE Marks : 50+25**

**SEE Marks : 50+25**

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

<b>C01</b>	Apply the concepts of conventional and non-conventional energy systems to design and develop alternate source of energy production.
<b>C02</b>	Analyze the different types of IC engines and refrigeration systems and solve problems related to them.
<b>C03</b>	Apply appropriate manufacturing techniques for product development in consequent to the professional Engineering practice in Mechanical Engineering.
<b>C04</b>	Apply the concepts of planes and projections and visualize the various ways to create the development of solid sheet metal Models with the aid of modern tools.
<b>C05</b>	Understand the impact of various systems, processes and solutions of mechanical engineering in societal and Environmental context.
<b>C06</b>	Analyze the different Engineering materials for their respective application in various engineering fields and study about their Joining processes.

**Mapping of Course outcomes to Program outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	-	3	-	-	-	-	-	-	-	-	-
C02	-	1	-	-	-	-	-	-	-	-	-	-
C03	3	-	3	-	-	2	-	-	-	-	-	-
C04	3	-	3	-	3	-	-	-	-	3	-	-
C05	-	-	-	-	-	2	1	-	-	-	-	1
C06	3	1	3	-	-	-	-	-	-	-	-	-

<b>Module No</b>	<b>Contents of Module</b>	<b>Hrs</b>	<b>Cos</b>
1	<p><b>Energy and its Importance:</b> Definition, classification based on long term availability, commercial applications, traditional use and Usability.</p> <p><b>Conventional energy sources and their conversion:</b> formation of fossil fuels, Energy conversion from fossil fuels, Nuclear Energy: Nuclear fission, nuclear fusion and utilization of nuclear energy. Hydel energy: Hydroelectric power generation</p>	10	C01

	<p><b>Non Conventional energy sources and their conversion</b></p> <p>Solar energy: Introduction, Heliocemical, helioelectrical and heliothermal process, Wind Energy: Schematic diagram of windmill, advantages and disadvantages of wind energy.  <b>Geothermal Energy Conversion:</b> Open cycle – working principle, closed cycle – working principle, advantages and disadvantages</p>		
	<p><b>List of Experiments:</b></p> <ol style="list-style-type: none"> <li>1. Introduction to development of lateral surfaces, types , section plane concepts</li> <li>2. Development of regular pentagonal, square &amp; hexagonal prism</li> </ol>	6	
2	<p><b>Internal Combustion Engines:</b> Classification, I.C. Engines parts and terminology, principle and operation of 2 Stroke and 4 stroke Petrol engines, 4 stroke diesel engines with P-V diagrams. Performance parameters: indicated power, brake power, friction power, indicated thermal efficiency, brake thermal efficiency, mechanical efficiency, specific fuel consumption, simple numerical problems.</p> <p><b>Refrigeration and Air-Conditioning:</b> Refrigeration: Definitions- Refrigerating effect, Ton of Refrigeration, COP, Working principle of vapour compression refrigeration and vapour absorption refrigeration. Refrigerants: properties, list of commonly used refrigerants. Air conditioning: working principle of Room (window) air conditioner and applications</p>	10	CO2, CO3
	<p><b>List of Experiments:</b></p> <ol style="list-style-type: none"> <li>1. Development of right circular cone &amp; frustum of cone</li> <li>2. Development of pyramid &amp; frustum of pyramid</li> </ol>	7	
3	<p><b>Lathe and Drilling Machines:</b></p> <p><b>Lathe:</b> Classification of lathe, Specification of lathe, Principle of working of a center lathe, major parts of a lathe, Lathe operations: cylindrical turning, facing, thread cutting, drilling, knurling. Taper turning: By swivelling of compound rest method and by tail stock offset method</p> <p><b>Drilling machine:</b> Classification of drilling machines, Specification of radial drilling machine, Twist drill and its nomenclature, Bench drilling machine and radial drilling machine, drilling machine operations: drilling, boring, reaming, tapping, counter sinking and counter boring</p>	8	CO3, CO4

	<b>List of Experiments:</b> 1. Development of cylinders and truncated cylinders 2. Model 1 & 2-Truncated and frustum of cone	6	
4	<b>Milling machine:</b> Classification of milling machine, principle of milling: Up milling and down milling operations, Horizontal and vertical milling machines. Milling operations: slab milling, end milling, slot milling.  <b>Grinding machine:</b> Classification of grinding machine and operation of grinding machine, types of grinding machines: Surface, Cylindrical and Center less grinding machine.	8	CO3, CO4
	<b>List of Experiments:</b> 1. Model 3 & 4-Truncated & frustum of pyramid 2. Model- 5& 6-Prism & funnel	7	
5	<b>Engineering Materials:</b> Properties of materials, types and applications of Ferrous & Nonferrous metals and alloys. Stress-strain curve for ductile and brittle materials, Hooke's law, Simple problems on stress and strain  <b>Composite Materials:</b> Introduction: definition, classification, different types of fabrication and applications.	8	CO4, CO5, CO6
	<b>List of Experiments:</b> 1. Welding: Introduction, types of welding, Model 1,2,3 2. Brazing: Introduction and Model	7	

### SELF STUDY

Latest Technological Developments in the field of Mechanical Engineering are to be given to the students in three separate batches with minimum of TWO reports to be submitted by each student

### TEXT BOOKS:

1. **A Text Book of Mechanical Engineering** , K R Gopalkrishna, 30th Edition, 2012, Subhas Publishers, Bangalore
2. **A Text Book of Elements of Mechanical Engineering** – S. Trymbaka Murthy, 3rd Revised Edition 2006, I.K. International Publishing House Pvt Ltd, New Delhi



## REFERENCE BOOKS:

1. **Elements of Mechanical Engineering**, SKH Chowdhary, AKH Chowdhary & Nirjar
2. Roy, Media Promoters and Publishers, Mumbai
3. **Non Conventional Energy Resources** , B H Khan ,Tata McGraw Hill publishing company Limited,2nd Edition 2006.
4. **Computer Aided Engineering Drawing** - K. R. Gopalakrishna, Subash Publishers, Bangalore.
5. **Elements of Mechanical Engineering**, Manglik V.K, PHI Publications, 2013
6. **Basic Mechanical Engineering**-Pravin Kumar,2013 Edition, Pearson

### Assessment Pattern

#### CIE: Continuous Internal Evaluation (50 Marks)

Bloom's Category	Tests	Assignments	Quizzes	Self Study
Marks (out of 50)	30	05	05	10
Lab Marks (Out of 25)	10	10	05	
Remember	10	05	05	
Understand	15	05		
Apply	10	05	05	
Analyze	05			
Evaluate				
Create				10

#### CIE: Continuous Internal Evaluation for lab (25 Marks)

Bloom's Category	Tests	Assignments	Viva
Marks (out of 25)	10	10	05
Remember	02	02	03
Understand	02	02	02
Apply	02	02	
Analyze	02	02	
Evaluate	02		
Create		02	

**SEE: Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Theory (50 Marks)</b>
Remember	10
Understand	15
Apply	15
Analyze	05
Evaluate	05
Create	

**SEE: Semester End Examination for lab(25Marks)**

<b>Bloom's Category</b>	<b>Lab (25 Marks)</b>
Remember	05
Understand	05
Apply	04
Analyze	03
Evaluate	03
Create	05

## ELEMENTS OF CIVIL ENGINEERING

**Course Code : 15CIV14/24**

**L:P:T:S : 3:0:1:0**

**Exam Hours : 3 Hours**

**Credits : 04**

**CIE Marks : 50**

**SEE Marks : 50**

**Course Outcomes : At the end of the Course, the student will be able to:**

C01	Apply the knowledge of science and engineering fundamentals to the solution of civil engineering problems and to comprehend with structures, materials and its components.
C02	Analyze and compute the reactive forces and its effects using principles of mathematics and engineering sciences.
C03	Formulate and apply the conditions of static equilibrium to solve the problems of civil engineering.
C04	Apply the knowledge of science and engineering fundamentals of sliding (Dry) friction to the problems involving incipient equilibrium of a variety of connected bodies.
C05	Apply the appropriate techniques and tools to locate the centroid and compute the second moment of area.
C06	Analyze the motion of particles and apply D'Alemberts principle to solve the problems of kinetics and kinematics.

**Mapping of Course Outcomes to Program Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02
C01	3	3	-	-	-	-	-	-	-	-	-	-	3	-
C02	3	3	3	-	-	-	-	-	-	-	-	-	3	-
C03	3	3	3	-	-	-	-	-	-	-	-	-	3	-
C04	3	3	3	-	-	-	-	-	-	-	-	-	3	-
C05	3	-	3	-	-	-	-	-	-	-	-	-	3	-
C06	3	3	3	-	-	-	-	-	-	-	-	-	3	-

Module No	Content of Module	Hrs	COs
1	Scope of Civil Engineering- Housing, Roads, Bridges and Dams, Basic Introduction of Building Materials – cement, bricks/blocks, aggregate(s), timber, steel, composites, Components of a structure - Substructure, Super structure and Finishes.	4	CO1
	Principle of statics, Particle, continuum, Rigid body, Force and its characteristics, Types of forces and classification of force systems, Principle of physical independence of forces, Principle of transmissibility of forces, Principle of superposition of forces, Composition of forces - Definition of Resultant; Composition of coplanar concurrent force system, Parallelogram law	5	

	of forces, Resolution of forces.		
2	Moment of a force, Couple, Characteristics of couples, Varignon's theorem of moments, Composition of coplanar - non-concurrent force system, Equivalent force - couple system, Numerical problems on composition of coplanar non-concurrent force systems. Equilibrium of forces – Equilibrium of concurrent, parallel and general forces in a plane, equilibrium of three forces in a plane, Definition of equilibrant, Lami's theorem; Resultant and equilibrium of concurrent and parallel forces in space, Numerical problems on equilibrium of coplanar – concurrent and non concurrent force systems.	5	CO1, CO2, CO3
	(B) Introduction to beams, Types of loads and supports, Support reactions, statically determinate beams with point load (normal and inclined) and uniformly distributed/varying loads, Numerical problems.	4	
3	Friction-static friction, Laws of friction, Limiting friction, Angle of friction, angle of repose, Impending motion on horizontal and inclined planes, Ladder and block friction, Numerical problems.	4	CO4, CO5
	(B) Centroid of line and area, Centroid of regular figures, Locating the centroid of triangle, semicircle, quadrant of a circle and sector of a circle using method of integration, Centroid of composite sections; Numerical problems.	4	
4	Second moment of area, polar moment of inertia, Radius of gyration, Perpendicular and Parallel axis theorems, Moment of Inertia of rectangular, circular and triangular areas from method of integration, composite sections, Numerical problems.	5	CO5
	(B) Analysis of simple determinate trusses by method of joints and sections	4	
5	Rectilinear motion of particles: (A) Kinetics- Newtons second law of motion and D'Alemberts principle for rectilinear motion of a particle, Numerical problems.	4	CO6
	(B) Work, Power, Energy, principle for particles- Conservation of energy, Work energy principle for rectilinear motion, Numerical problems.	5	

**Text Books:**

1. Elements of Civil Engineering by S.S. Bhavikatti, New Age International Publisher, New Delhi, 5<sup>th</sup> Edition, 2015
2. Elements of Civil Engineering and Engineering Mechanics by M.N.Sheshaprakash and G.B.Mogaveer PHI publications, 2<sup>nd</sup> Edition, 2012
3. Elements of Civil Engineering and Engineering Mechanics by H.J. Sawant and S.P.Nisture, Technical publications, 1<sup>st</sup> Edition, 2015

**Reference Books:**

1. Engineering Mechanics by S.Timoshenko, D.H.Young, and J.V.Rao TATA McGraw-Hill Book Company, New Delhi, 5<sup>th</sup> Edition, 2013
2. Engineering Mechanics by K.L. Kumar, Tata McGraw-Hill Publishing Company, New Delhi, 4<sup>th</sup> Edition, 2010
3. Engineering Mechanics by Nelson, Tata McGraw Hill Edn. India Pvt Ltd, 2013

**CIE- Continuous Internal Evaluation (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>	<b>Assignments</b>	<b>Quizzes</b>
<b>Marks ( out of 50)</b>	30	10	10
Remember	5		
Understand	10	5	
Apply	7	5	5
Analyze	5		5
Evaluate	3		
Create	-	-	

**SEE – Semester End Examination (50 Marks)**

<b>Bloom's Category</b>	<b>Tests</b>
Remember	10
Understand	10
Apply	15
Analyze	15
Evaluate	-
Create	-

**Percentage Evaluation of Various Blooms' levels**

<b>Bloom's Category</b>	<b>CIE</b>	<b>SEE</b>	<b>TOTAL</b>	<b>%</b>
Remember	5	10	15	15
Understand	15	10	25	25
Apply	17	15	32	32
Analyze	10	15	25	25
Evaluate	3	-	3	3
Create	-	-	-	-
<b>TOTAL</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>100</b>

## BASICS OF ELECTRICAL ENGINEERING

**Course Code : 15EEE15/25**  
**L:P:T:S : 3:0:1:0**  
**Exam Hours : 03**

**Credits 04**  
**CIE Marks 50**  
**SEE Marks 50**

**Course Outcomes: At the end of the Course, the Student will be able to:**

C01	Analysis and solve DC and AC electric circuit problems by applying basic electric circuit laws and analysis techniques
C02	Acquire knowledge about the construction, basic principle of operation and determine performance characteristic of various electrical equipments
C03	Acquire technical competence in specialized areas of engineering discipline to solve complex engineering problems
C04	Designing of domestic wiring, understanding the precautionary measures against electric shock and need for earthing
C05	Acquire knowledge about constructional, basic working principle and their differences between single, Two phase and poly phase system.
C06	Acquire knowledge about construction, basic working principle, efficiency of single phase transformer.

**Mapping of Course Outcomes to Program Outcomes:**

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C01	3	3	3	2	-	-	-	-	-	2	1	-
C02	3	3	3	2	-	-	-	-	-	2	1	-
C03	3	3	3	2	-	-	-	-	-	2	1	-
C04	3	3	3	2	-	-	-	-	-	2	1	-
C05	3	3	3	2	-	-	-	-	-	2	1	-
C06	3	3	3	2	-	-	-	-	-	2	1	-

SYLLABUS			
Module	Contents of the Module	Hours	COs
<b>1</b>	<p><b>Electric Elements &amp; Circuit Laws:</b>                      Charge and electric forces, voltage, current and magnetic forces. Ohm's law – Resistance, Specific Resistance, Conductivity, Temperature coefficient of resistance and resistor colour coding, Kirchhoff's voltage law and current law. Characteristics of series and parallel circuits. Current divider and voltage divider rules. Equivalent resistance of series – parallel circuits, definitions of work, power, energy and heating effects of electrical current</p> <p><b>Circuit Analysis &amp; Techniques:</b>                      Introduction to Superposition, Thevenin's, Norton's theorems and Maximum power transfer theorem (Only with independent sources and Resistive elements)</p>	<b>10</b>	<b>CO1, CO3</b>

2	<p><b>Magnetic Fields:</b> Faradays law-Induced EMF- Dynamically Induced EMF and Statically Induced EMF, Self-induced EMF and Mutually Induced EMF. Self-inductance of a Coil and Mutual Inductance (all the laws associated), Energy Stored in Inductor and Capacitor.</p> <p><b>Introduction to D.C Machines:</b> Principles and construction of D.C machines, EMF equation, classification of D.C. machines based on method of excitation, load characteristics of D.C generators, critical resistance, voltage regulations, speed and torque characteristics of D.C motors. Testing and efficiency of D.C machine, applications.</p>	10	CO2, CO3
3	<p><b>AC Circuits:</b> Sinusoidal source, maximum, average and RMS values, form factor, analysis of R, L &amp; C circuits. Complex algebra and phasor diagrams. Reactance, susceptance, impedance and admittance. problems involving series, parallel and series – parallel circuits, Power triangle - Real power, reactive power, apparent power and Power factor.</p> <p><b>Transformers:</b> Single-phase transformers, construction and principles of operation, classification of transformers, E.M.F equation, turns ratio, ideal - equivalent circuit, phasor diagram, losses, efficiency, regulation and applications.</p>	10	CO1, CO3, CO2,CO5,CO6
4	<p><b>Three-Phase Circuits:</b> Introduction to single phase and poly phase, Advantages of poly-phase systems over single phase systems. Generation of various phase voltages (2 and 3). Relationship between line and phase quantities in Star and Delta for balanced systems, measurement of power using various methods and determining power factor using two watt Meter readings.</p> <p><b>Domestic wiring:</b> Brief discussion on concealed conduit wiring. Two-way and three-way control of lamps, Electric shock: precautions against shocks. Protective devices – fuses, MCB's ,Earthing – importance, pipe earthing, plate earthing.</p>	7	CO1,CO4, CO5
5	<p><b>Induction Machines:</b> Three- phase induction motor, production of rotating magnetic field, construction and principle of operation, types of Rotor, slip and its significance, necessity of starter, applications.</p> <p><b>Measuring Instruments:</b> Construction and Principle of operation of dynamometer type wattmeter and single phase induction type energy meter.</p>	7	CO2,CO3

**TEXT BOOK:**

1. “Basic Electrical Engineering”, DC Kulshreshtha, TMH, 2009 edition
2. “Basic Electrical and Electronics Engineering”, S.K. Bhattacharya, Pearson Publications

**REFERENCE BOOKS:**

1. E.Hughes, ”Electrical Technology”, Pearson publishers.
2. “Basic Electrical, Electronics and Computer Engineering”, Muthusubramanian R, Salivahanan S and Muraleedharan K A, Tata McGraw Hill, Second Edition.
3. “Basics of Electrical and Electronics Engineering”, Nagsarkar T K and Sukhija M S, Oxford press University Press.
4. S.Parker Smith & N N Parker Smith, ”Problems in Electrical Engineering”.
5. Electrical Technology B.L Teraja, Latest edition.
6. Basic Electrical Engineering , 3<sup>rd</sup> edition, TMH, D.P.Kothari.

**Assessment Pattern****CIE- Continuous Internal Evaluation (50 Marks)**

Bloom“s Category	Tests	Assignments	Seminar
<b>Marks (out of 50)</b>	30	10	10
Remember	10		5
Understand	10		
Apply	5	10	5
Analyze	5		
Evaluate			
Create			

**SEE- Semester End Examination (50 Marks)**

Bloom“s Categoror	Tests
Remember	10
Understand	10
Apply	30
Analyze	
Evaluate	
Create	



## BUSINESS COMMUNICATION

**Course Code : 15HSS162/262**  
**L:P:T:S : 2:0:0:0**  
**Exam Hours : 02**

**Credits 02**  
**CIE Marks 50**  
**SEE Marks 50**

**Course Outcomes: At the end of the Course, the Student will be able to:**

CO1	understand the concept, Process and important of communication
CO2	Gain Knowledge of media of communication
CO3	Develop skills of effective communication- both written and oral
CO4	Develop a holistic approach towards enhancing their professional behavior, self-confidence and proficiency

**Mapping of Course Outcomes to Program Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	3	2	3	-	3
CO2	-	-	-	-	-	-	-	3	2	3	-	3
CO3	-	-	-	-	-	-	-	3	2	3	-	3
CO4	-	-	-	-	-	-	-	3	2	3	-	3

<b>Syllabus</b>			
<b>Module</b>	<b>Contents of the Module</b>	<b>Hours</b>	<b>COs</b>
<b>1</b>	Types, purpose and definition of communication process – 7 Cs of communication, Barriers of Effective communication and overcoming the barriers	<b>05</b>	<b>CO1, CO2, CO3, CO4</b>
<b>2</b>	Non –Verbal Communication (Body Language): Kinesics, Occulesics, Paralanguage, Proxemics, Artifacts, Chronemics & Tactilics and Presentation Skills	<b>04</b>	<b>CO1, CO2 CO3, CO4</b>
<b>3</b>	Importance of Listening: Listening Vs. Hearing Types of Listening, Barriers of Listening and Traits of a good listener	<b>03</b>	<b>CO1, CO2, CO3, CO4</b>
<b>4</b>	The four main types of reading techniques – Skimming, Scanning, Intensive & Extensive	<b>04</b>	<b>CO1, CO2, CO3, CO4</b>
<b>5</b>	Written Communication: Business Letter Writing: Placing Orders & Letters of Complaint, Job Application Letter Writing Email Writing, Resumes & CVs and Expansion of Ideas	<b>06</b>	<b>CO1, CO2, CO3, CO4</b>

**Text Books:**

- Basic Business Communication: Skills For Empowering The Internet Generation- Flatley and Lesikar, Tata McGraw Hill, 10<sup>th</sup> Edition, 2005
- Business and Professional Communication: Keys for Workplace Excellence- Kelly M.

Quintanilla

- Business Communication-P.D. Chaturvedi and MukeshChaturvedi, Pearson Education

**Reference Books:**

- The Skills of Communicating-Bill Scott-Jaico Books
- Writing, Speaking, Listening-Helen Wilkie- Jaico Books

**Assessment Pattern:**

**CIE- Continuous Internal Evaluation (50 Marks)**

<b>Bloom"s Category</b>	<b>Tests</b>	<b>Assignments</b>	<b>Presentation</b>
<b>Marks (out of 50)</b>	20	15	15
Remember	1	-	-
Understand	2	-	-
Apply	6	5	5
Analyze	3	-	-
Evaluate	3	-	-
Create	5	10	10

**SEE – Semester End Examination (50 Marks)**

<b>Bloom"s Category</b>	<b>Tests</b>
Remember	5
Understand	10
Apply	10
Analyze	10
Evaluate	5
Create	10

## CONSTITUTION OF INDIA & PROFESSIONAL ETHICS

**Course Code : 15HSS172/272**

**L:P:T:S : 2:0:0:0**

**Exam Hours : 02**

**Credits 0**

**CIE Marks 25**

**SEE Marks 25**

### Expected Course Outcomes:

<b>CO1</b>	To enable the learner with constitutional and engineering ethics knowledge.
<b>CO2</b>	To prepare learner for problem solving in legal and professional ethics front.
<b>CO3</b>	To inculcate in learner the sense of legal awareness and social & ethical responsibility.

### Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>CO1</b>	-	-	-	-	-	-	-	2	-	3	-	-
<b>CO2</b>	-	-	-	-	-	-	-	2	-	3	-	-
<b>CO3</b>	-	-	-	-	-	-	-	2	-	3	-	-

### Syllabus

Module	Contents of the Module	Hours	COs
<b>1</b>	Introduction to Constitution of India, Salient features of the Constitution, Preamble to Indian constitution. Fundamental Rights & its limitations, decided case studies. Right to information Act.	05	CO1, CO2, CO3
<b>2</b>	Directive Principles of State Policy, Fundamental duties. Union Executives – President, Prime Minister, Parliament, Supreme Cou of India.	04	CO1, CO2, CO3
<b>3</b>	State Executives-Governor, Chief Minister, State Legislature, High Court of State, Electoral Process in India.	04	CO1, CO2, CO3
<b>4</b>	Special Provision for SC & ST. Special Provision for Women, Children & Backward Classes. Emergency Provisions. National Human Rights Commission.	04	CO1, CO2, CO3

<b>5</b>	Scope & Aims of Engineering Ethics. Responsibility of Engineers, Impediments to Responsibility. Risks, Safety and liability of Engineers. Honesty, Integrity & Reliability in Engineering. Corporate Social Responsibility.	05	CO1, CO2, CO3
----------	---	----	---------------

**Text Books:**

1. Durga Das Basu: **“Introduction to the Constitution on India”**, (Students Edn.) Prentice – Hall EEE, 19th / 20th Edn., 2001
2. Charles E. Haries, Michael S Pritchard and Michael J. Robins **“Engineering Ethics”** Thompson Asia, 2003-08-05.

**Reference Books:**

1. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **“Engineering Ethics”**, Prentice – Hall of India Pvt. Ltd. New Delhi, 2004
2. Brij Kishore Sharma, **“Introduction to the Constitution of India”**, PHI Learning Pvt. Ltd., New Delhi, 2011.

**CIE- Continuous Internal Evaluation (25 Marks)**

<b>Bloom’s Category</b>	<b>Tests</b>
<b>Marks (out of 25)</b>	<b>25</b>
Remember	15
Understand	05
Apply	05
Analyze	-
Evaluate	-
Create	-

**SEE- Semester End Examination (25 Marks)**

<b>Bloom’s Category</b>	<b>Tests</b>
Remember	15
Understand	05
Apply	05
Analyze	-
Evaluate	-
Create	-