NEW HORIZON
COLLEGE OF ENGINEERING

Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA

Academic Year 2017-18

First and Second Semesters Bachelor

of Engineering (B.E) (Common to all

Branches)

Scheme and Syllabus

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CHEMISTRY CYCLE SYLLABUS

PHYSICS CYCLE SYLLABUS

CREDIT SCHEME FOR FIRST SEMESTER B.E

Sl. No	Course Code	Course	BoS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	P	T	S			CIE	SEE	Total
								FIRST SEMESTER- CHEMISTRY CYCLE				
1	MAT11	Engineering Mathematics-I	Sciences	4	0	1	0	5	6	50	50	100
2	CHE12	Engineering Chemistry	Sciences	3	1	0	1	5	5	75	75	150
3	CSE13	Introduction to Programming with C	CSE	3	1	0	1	5	5	75	75	150
4	MEE14	Computer Aided Engineering Drawing	ME	2	1	1	0	4	6	50	50	100
5	ECE15	Basic Electronics	ECE	3	0	1	0	4	5	50	50	100
6	HSS161	Environmental Science and Awareness	HSS	2	0	0	0	2	2	25	25	50
7	HSS171	Essential English	HSS	Mandatory Course				0	2	25	25	50
Total								25	31	350	350	700

Sl. No	Course Code	Course	BoS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	P	T	S			SEE	CIE	Total
								FIRST SEMESTER- PHYSICS CYCLE				
1	MAT11	Engineering Mathematics -I	Sciences	4	0	1	0	5	6	50	50	100
2	PHY12	Engineering Physics	Sciences	3	1	0	1	5	5	75	75	150
3	MEE13	Elements of Mechanical Engineering	ME	3	1	0	1	5	5	75	75	150
4	CIV14	Elements of Civil Engineering	CV	3	0	1	0	4	5	50	50	100
5	EEE15	Basics of Electrical Engineering	EE	3	0	1	0	4	5	50	50	100
6	HSS162	Professional Communication	HSS	2	0	0	0	2	2	25	25	50
7	HSS172	Constitution of India and Professional Ethics	HSS	Mandatory Course				0	2	25	25	50
Total								25	30	350	350	700

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	MAT21	Engineering Mathematics-II	Sciences	4	0	1	0	5	6	50	50	100
2	CHE22	Engineering Chemistry	Sciences	3	1	0	1	5	5	75	75	150
3	CSE23	Introduction to Programming with C	CSE	3	1	0	1	5	5	75	75	150
4	MEE24	Computer Aided Engineering Drawing	ME	2	1	1	0	4	6	50	50	100
5	ECE25	Basic Electronics	ECE	3	0	1	0	4	5	50	50	100
6	HSS261	Environmental Science and Awareness	HSS	2	0	0	0	2	2	25	25	50
7	HSS271	Essential English	HSS	Mandatory Course				0	2	25	25	50
Total								25	31	350	350	700

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	MAT21	Engineering Mathematics-II	Sciences	4	0	1	0	5	6	50	50	100
2	PHY22	Engineering Physics	Sciences	3	1	0	1	5	5	75	75	150
3	MEE23	Elements of Mechanical Engineering	ME	3	1	0	1	5	5	75	75	150
4	CIV24	Elements of Civil Engineering	CV	3	0	1	0	4	5	50	50	100
5	EEE25	Basics of Electrical Engineering	EE	3	0	1	0	4	5	50	50	100
6	HSS262	Professional Communication	HSS	2	0	0	0	2	2	25	25	50
7	HSS272	Constitution of India and Professional Ethics	HSS	Mandatory Course				0	2	25	25	50
Total								25	30	350	350	700

CHEMISTRY CYCLE

ENGINEERING MATHEMATICS – I

Course Code :   MAT11   **Credits : 05**

L:P:T:S   : 4:0:1:0   **CIE Marks : 50**

Exam Hours : 03   **SEE Marks : 50**

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

CO1	Understand the principles of engineering mathematics through calculus
CO2	Calculate the extreme values of a function of two variables
CO3	Understand the concept of vectors as a tool for solving engineering problems
CO4	Develop the ability to construct mathematical models involving differential equations and interpret their solutions physically
CO5	Apply ideas from linear algebra in solving systems of linear equations

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	1	1	-	3
CO2	3	3	2	1	2	-	-	-	1	1	-	2
CO3	3	3	2	1	3	-	-	-	2	1	-	1
CO4	3	3	3	3	3	-	-	-	3	2	-	2
CO5	2	2	2	2	1	-	-	-	1	1	-	2

	Course Syllabus		
Module No.	**Contents of the Module**	**Hours**	**COs**
1	**Solid Geometry :** Recapitulation of a Plane, Straight lines. Problems on Right circular cone and Right circular cylinder. **Polar Curves**: Angle between the radius vector and tangent (Derivation & Problems), angle between two curves (Problems), Pedal equation for polar curves (Problems). Taylor's and Macluarin's theorems for function of one variable (statement and Problems).	9	CO1
2	**Partial derivatives**: Introduction to partial differentiation, Euler's theorem(Derivation & Problems), Total derivatives , Partial differentiation of composite functions and Jacobian-definition & Problems. **Applications:** Maxima and Minima of functions of two variables Problems.	9	CO2
3	**Vector Calculus:** Derivative of vector valued functions, Velocity, Acceleration , Scalar and Vector point functions, Gradient, Divergence, Curl, Solenoidal and Irrotational vector fields- Problems. Vector identities - div(ϕA), curl (ϕA), curl(grad ϕ), div(curl A) and Curl(Curl A). **Applications:** Potential functions, line integral and work done-Problems	9	CO3
4	**Integral Calculus:** Reduction formulae: $\int \sin^n x\, dx, \int \cos^n x\, dx$ and $\int \sin^m x \cos^n x\, dx$ where m and n are positive integers, Evaluation of these integrals with standard limits 0 to $\pi/2$-Problems. **Curve Tracing**: Tracing of cartesian and polar curves: (i) Cissoid (ii) Strophiod (iii) Cardioide (iv) Lemniscate **Differential Equations**: Solution of first order and first degree differential equations: Problems on Linear and Bernoulli's differential equations. **Applications**: Newton's law of cooling, flow of electricity, laws of decay & growth-Problems.	9	CO4
5	**Linear Algebra:** Problems on rank of a matrix by elementary transformations, solution of system of linear equations: Gauss elimination method and Gauss-Jordon method, Linear transformation, Eigen values and Eigen vectors of a square matrix, Diagonalisation of a square matrix, Quadratic forms, reduction to Canonical form by orthogonal transformation-Problems.	9	CO5

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley-India Publishers, 10th Edition, 2014, ISBN: 978-81-265-5423-2.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014, ISBN: 978-81-7409-195-5.

Reference Books:

1. Glyn James, Modern Engineering Mathematics, Prentice Hall, 4th Edition, 2015, ISBN: 978-0-273-73409-3
2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education (India) Private Limited, 4th Edition, 2016, ISBN: 978-0-07-063419-0.
3. H. K. Dass, Advanced Engineering Mathematics, S. Chand & Company Ltd., 28th Edition, 2012, ISBN: 81-219-0345-9.
4. N.P.Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications (P)Ltd., 9th Edition, 2014, ISBN: 978-81-318-0832-0.

Assessment Pattern:

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

Bloom's Category	Tests (25 Marks)	Assignments (10 Marks)	Quizzes (5 Marks)	External Co-curricular participation (10 Marks)
Remember	5	5	-	-
Understand	5	5	-	-
Apply	5	-	5	10
Analyze	5	-	-	-
Evaluate	5	-	-	-
Create	-	-	-	-

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

Bloom's Category	Questions (50 Marks)
Remember	10
Understand	10
Apply	20
Analyze	5
Evaluate	5
Create	-

ENGINEERING CHEMISTRY

Course Code : CHE12/22   **Credits**   : 05
L:P:T:S   : 3:1:0:1   **CIE Marks** : 50+25
Exam Hours : 03+03   **SEE Marks** : 50+25

COURSE OUTCOMES: On completion of the course student will be able to

CO1	Recall and explain the principles of chemistry related to electrochemistry, metals, natural resources, polymers and engineering materials.
CO2	Apply the knowledge of chemistry in solving societal problems related to public health, safety, environmental issues and developing new materials.
CO3	Identify, analyze and interpret engineering problems in chemistry perspective to achieve solutions.
CO4	Select the solutions to engineering problems for their suitability and sustainability.
CO5	Perform the various types of titrations for quantitative estimation of industrially important materials and gain hands on experience in handling the different types of instruments for chemical analysis.

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	2	-	3
CO2	3	3	3	2	2	3	3	2	2	2	-	3
CO3	3	3	3	2	2	3	3	2	2	2	-	3
CO4	3	3	2	2	2	2	3	2	2	2	-	3
CO5	3	2	2	1	2	2	1	1	1	1	-	3

	COURSE SYLLABUS		
Module	**Contents of the Module**	**Hour**	**COs**
1	**Electrochemistry-**Introduction to galvanic cells, Derivation of Nernst equation for single electrode potential. Emf of the cell, electrochemical conventions and problems. Reference electrodes - Construction, working and applications of Calomel and Ag-AgCl electrodes. Measurement of electrode potential using calomel electrode. Electrolyte Concentration cells: Numerical problems on electrolyte concentration cells. Construction and working of glass electrode, determination of pH using glass electrode. **Battery Technology –** Introduction, classification-primary, secondary and reserve batteries. Construction, working and applications Lead acid battery. Zn-Air battery and Lithium ion battery ($LiCoO_2$). **Fuel Cells:** Introduction, Construction, working and applications of Methanol-oxygen fuel cell. Super Capacitors – Principle, explanation and construction.	9	CO1,CO2,CO3 ,CO 4 & CO5
	List of Experiments 1. Estimation of iron content in the given solution by potetiometry 2. Determination of pKa value of a weak acid using pH meter	6	
2	**Corrosion and Metal Finishing** **Corrosion –** Introduction, Electrochemical theory of corrosion. Factors affecting rate of corrosion, anodic and cathodic area, Nature of metal, Nature of corrosion product and pH. Types of corrosion – differential metal, differential aeration corrosion (pitting and waterline) and stress corrosion. Corrosion control techniques: – protective coatings – metal coatings (Anodic and Cathodic metal coatings taking Galvanization and Tinning as example). Inorganic coatings - Anodizing of aluminum. Cathodic protection by sacrificial anodic method and Impressed voltage method. **Metal Finishing**-Introduction and technological importance. Polarization, decomposition potential and over voltage with respect to metal finishing. Factors influencing the nature of electro deposit- current density, concentration of metal ions, pH, temperature, additives(organic additives and complexing agents).Throwing power of plating bath and its determination by Haring - Blum cell. Electro plating of Gold (Alkaline cyanide bath). Electroless plating – Introduction, distinction between electro plating and electroless platin Electroless plating of copper and its applications in making PCB.	9	CO1,CO2,CO3 ,CO 4 & CO5
	List of Experiments 1. Determination of percentage of iron in haematite ore. 2. Estimation of copper in given solution by Iodometry. 3. **3.** Determination of % CaO in Cement solution using std EDTA solution	9	
3	**Chemical Energy Sources and Photovoltaic Cells** **Chemical Energy Sources:** Introduction, classification, importance of hydrocarbons. Calorific value – Gross and Net calorific value. Determination of calorific value of fuel using Bomb calorimeter- Numerical problems. Cracking – Introduction, Fluidized catalytic cracking. Reformation of petrol. Octane and Cetane numbers. Mechanism of knocking in petrol and diesel engines. Anti knocking agents, unleaded petrol, power alcohol and biodiesel. **Photovoltaic cells**	8	CO1,CO2,CO3 CO1,CO2,CO3 CO 4 & CO5

	Introduction, importance, conversion and utilization of solar energy. Construction and Working of photo voltaic cells. Advantages and disadvantages of PV cells. Production of solar grade silicon (union carbide process). Purification of silicon by Zone refining.			

	List of Experiments 1. Determination of viscocity coefficient of given organic liquid.	3	
4	**Water Technology: -** Introduction. Boiler feed water. boiler troubles - Scale and sludge formation, Priming and foaming, Boiler corrosion due to dissolved O_2, CO_2, $MgCl_2$ and prevention. Determination of COD-Numerical problems. Softening of water by ion exchange process. Desalination of sea water by electro dialysis. Sewage treatment: Primary and Secondary treatment (activated sludge method). **Instrumental Methods of Analysis:** Principle, theory, instrumentation and applications of conductometry, colorimetry and flame photometry.	9	CO1,CO2,CO3 ,CO 4 & CO 5
	List of Experiments 1. Determination of total hardness of water sample by preparing std. EDTA solution 2. Determination of chemical oxygen demand (COD) of the given industrial waste sample 3. Determination of total alkalinity of a given sample of water using standard Hydrochloric acid. 4. Estimation of HCl and CH_3COOH in a mixture using std. NaOH b conductometry. 5. Estimation of sodium in the given sample by flame photometry. 6. Estimation of copper in the given test sample by colorimetry.	18	
5	**Polymers-** Introduction, types of polymerization- addition and condensation. Free radical mechanism taking vinyl chloride as an example. Glass transition temperature, Factors influencing Tg-Flexibilit intermolecular forces, molecular mass, branching, cross linking, significance of Tg. Synthesis, properties and applications of Polyurethane, Teflon and Kevlar fibre. Polymer composites – Introduction, properties and applications. Biodegradable polymers – meaning, poly lactic acid – synthesis and applications. **Nanomaterials**: Introduction, Classification based on dimension (0D, 1 2D and 3D), properties (size dependent – Catalytic, Thermal and Optical). Synthesis - Bottom up approach. Precipitation technique and Chemical vapour deposition with one example. General applications of nano materials	9	CO1,CO2,CO3 ,CO 4 & CO 5

Text Books

1. Chemistry for Engineering Students, B. S. Jaiprakash, R. Venugopal, Shivakumaraiah and Pushpalyengar, 2015 Edition, SubhashPublications, Bangalore
2. Engineering Chemistry by R. V. Gadag and A. NityanandaShetty, , 3rd Edition, 2014 I K International Publishing House Pvt. Ltd., New Delhi.
3. Engineering Chemistry by V R Kulkarni and K.Ramakrishna Reddy, 1st Edition, 2016, New Age International Publishers.
4. A Text Book of Engineering Chemistry, Jain and Jain, 3rd Edition, 2014 Dhanpatrai Publications

Reference Books

1. Engineering Chemistry by O. G. Palanna, Tata McGraw Hill Education Pvt. Ltd.
2. Corrosion Engineering by M. G. Fontana, Tata McGraw Hill Education Pvt. Ltd. New Delhi.
3. Engineering Chemistry, Wiley India second Edition 2014.
4. 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	Assignment	Quiz	External Co-curricular participation (10 Marks)
Marks (out of 50)	**25**	**10**	**5**	**10**
Remember	5	2	2	
Understand	10	5	1	
Apply	5	3	1	
Analyze	5	-	1	
Evaluate	-	-	-	
Create				

CIE- Continuous Internal Evaluation (25 Marks, lab)

Bloom's Category	Performance (day to day)	Internal test
Marks (out of 25)	**15**	**10**
Remember	03	02
Understand	03	02
Apply	06	04
Analyze	03	02
Evaluate		
Create		

SEE- Semester End Examination Theory (50 Marks)

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

SEE- Semester End Examination Lab (25 Marks)

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

INTRODUCTION TO PROGRAMMING WITH 'C'

Course Code : CSE13/23	**Credits** : 05
L:P:T:S : 3:1:0:1	**CIE Marks** : 50+25
Exam Hours : 03	**SEE Marks** : 50+25

Course Outcomes: On completion of the course students will be able to

CO1	Have fundamental knowledge on basics of computers hardware and number systems.
CO2	Demonstrate basic programming skills in the C Programming Language.
CO3	Use different data types in a computer program and able to design programs involving decision structures, loops, arrays, strings and functions.
CO4	Understand the dynamics of memory by the use of pointers and to use different structures and create or update basic data files.
CO5	Analysing and understanding of the basic sorting algorithms.
CO6	An understanding of the linear data structures such as stack, Queues.

Mapping of Course Outcomes to Program Outcomes :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	2	1	2	-	-	-	2
CO2	1	3	1	2	2	2	2	1	2	-	-	3
CO3	2	1	2	2	2	3	2	2	2	-	-	1
CO4	1	1	1	2	2	-	2	1	1	-	-	2
CO5	2	1	2	2	2	-	3	1	2	-	-	2
CO6	3	3	2	2	2	-	-	-	2	-	-	-

	COURSE SYLLABUS		
Module	**Contents of the Module**	**Hour**	**COs**
1	**Introduction to C Language:** Hardware components, Flowchart, Pseudo-code solution to problem, Basic concepts of a C program, Declaration, Assignment & Print statement, Types of operators and expressions, Programming examples and exercise.	6	**CO1, CO2**
2	**Branching and Looping:** Two way selection (if, if-else, nested if-else, cascaded if-else), switch statement, ternary operator? Go to, Loop (For, do-while, while) in C, break and continue, programming example an exercises.	8	
	List of Experiments 1. Design and develop a flowchart or an algorithm that takes three coefficients (*a*, *b*,and *c*) of a Quadratic equation ($ax2+bx+c=0$) 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 *reverse* of an integer number NUM 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: 2014, Reverse: 4102 Not a Palindrome 3. Design and develop a c program to implement simple calculator using switch case statement. 4. Draw the flowchart and Write a C Program to compute Sin(x) using Taylor series approximation given by Sin(x) = x - (x3/3!) + (x5/5!) - (x7/7!) + …….	6	**CO2 CO3**
3	**Arrays and Strings:** Using an array, Using arrays with Functions, 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. **Functions**: Functions in C, Argument Passing – call by value, Functions and program structure, location of functions, void and parameter less Functions, Recursion, programming examples and exercises.	12	
	List of related Experiments 5. a. Develop an algorithm, implement and execute a C program that reads *N* integer numbers and arrange them in ascending order using *Bubble Sort*. b. Develop, implement and execute a C program to search a number in a list using linear searching technique. 6. Develop, implement and execute a C program that reads two matrices *A* (m x n) and *B* (p x q) and Compute product of matrices *A* and *B*. Read matrix *A* and matrix *B* 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 orders of the matrices for multiplication. Report appropriate message in case of incompatibility.	6	**CO2 CO3 CO5**

	7. Write and execute a C program that: a. Implements string copy operation *STRCOPY* (str1, str2) that copies a string *st* to another string *str2* without using library function. b. Read a sentence and print frequency of vowels and total count of consonant 8. a. Design and develop a C function *RightShift(x ,n)* that takes two integers *x* and *n* as input and returns value of the integer *x* rotated to the right by *n* positions. Assume the integers are unsigned. b. Draw the flowchart and write a *recursive* C function to find the factorial of a number, *n*!, defined by *fact*(*n*)=1, if *n*=0. Otherwise *fact* (*n*) =*n**fact (*n*-1). Using this function, write a C program to compute the binomial coefficient *r nC*. Tabulate the results for different values of *n* and *r* with suitable messages.		
4	**Structures and File Management:** Basic of structures, structures and Functions Arrays of structures, structure Data types, type definition, Defining, opening an closing of files, Input and output operations, programming examples and exercises.	8	
	List of Experiments 9. Given two university information files "studentname.txt" and "usn.txt" that contains students Name and USN respectively. Write a C program to create a new file called "output.txt" and copy the content of files "studentname.txt" an "usn.txt" into output file in the sequence shown below. Display the contents o output file "output.txt" on to the screen. Student Name USN Name 1 USN1 Name 2 USN2 …. …. …. …. 10. Write a C program to maintain a record of n student details using an array (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.	15	CO3 CO4
5	**Pointers and Pre-processors:** Pointers and address, pointers and functions arguments, pointers and arrays, address arithmetic, character pointer and functions, pointers to pointer, Initialization of pointers arrays, Dynamic allocations methods, Introduction to Pre-processors, Complier control Directiv programming examples and exercises. **Introduction to Data Structures:** Primitive and non-primitive data types, Definition and applications of Stacks, Queues, Linked Lists and Trees.	10	CO4, CO6
	List of Experiments 11. Write a C program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of n real numbers.	3	

Text Books:

1. "The C programming Language", Brain W. Kernighan and Dennis M. Richie, 2 Edition,
PHI, 2012.

2. "Problem Solving with C ", Jacqueline Jones & Keith Harrow, 1 Edition ,Pearson 2011.

Reference Books:

1. "Computer Concepts and C Programming", Vikas Gupta, Dreamtech Press2013.
2. " Programming with C ", R S Bichkar, University Press,2012.
3. " Computer Programming in C ", V Rajaraman, 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	External Co-Curricular Participation
Marks (out of 50)	25	10	5	10
Remember	5		1	
Understand	5		1	
Apply	4		0.5	
Analyze	4	2	1	
Evaluate	2	4	1	
Create	5	4	0.5	

Assessment Method:
CIE- Continuous Internal Evaluation (25 Marks, Lab)

Bloom's Category	Tests
Marks (out of 25)	**25**
Remember	5
Understand	5
Apply	5
Analyze	5
Evaluate	5
Create	

SEE – Semester End Examination (50 Marks - Theory)

Bloom's Category	Tests(theory)
Remember	10
Understand	10
Apply	8
Analyze	8
Evaluate	4
Create	10

SEE – Semester End Examination (25 Marks - Lab)

Bloom's Category	Tests(theory)
Remember	5
Understand	5
Apply	5
Analyze	5
Evaluate	5
Create	

COMPUTER AIDED ENGINEERING DRAWING

Course Code	: MEE14/24	**Credits**	: 04
L:P:T:S	: 2:1:1:0	**CIE Marks**	: 50
Exam Hours	: 03	**SEE Marks**	: 50

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

CO1	Understand the theory of orthographic projections
CO2	Solve problems related to the projection of lines and also understand the concept of true and apparent length and inclinations.
CO3	Organize, demonstrate and arrange planes in different positions
CO4	Understand the concept of solids and visualize the arrangements in different positions.
CO5	Analyze the orthographic models and convert it into isometric views
CO6	Demonstrate the usage of CAD software

Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3	3	1	1	2	2	2	1
CO2	3	3	3	2	3	3	1	1	2	2	2	1
CO3	3	3	3	3	3	2	1	1	2	2	2	1
CO4	3	3	3	2	3	3	1	1	2	2	2	1
CO5	2	3	3	2	3	3	1	1	2	2	2	1
CO6	3	2	2	1	2	2	1	1	2	2	1	1

Course Syllabus			
Module No	**Contents of Module**	**Hrs**	**Cos**
1	**INTRODUCTION:** Introduction to Computer Aided Sketching: Introduction, Drawing instruments and their uses, BIS Conventions, Lettering, Dimensioning, geometrical constructions and freehand practicing. Introduction to software, commands used for engineering drawing **PROJECTION OF POINTS:** 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)	**10**	**CO1**

2	**PROJECTION OF STRAIGHT LINES** True and apparent lengths, True and apparent inclinations to reference planes (No application problems	10	CO1, CO2
3	**PROJECTION OF PLANE SURFACES** 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)	10	CO1, CO3, CO6
4	**PROJECTIONS OF SOLIDS** Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions (No problems on octahedrons and combination solid).	20	CO4, CO6
5	**ISOMETRIC PROJECTIONS (USING ISOMETRIC SCALE ONLY)** 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).	16	CO5,CO6

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 Com puter 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)

Bloom's Category	Tests	Assignments	Surprise Test	External Co-curricular participation
Marks (out of 50)	**25**	**10**	**5**	**10**
Remember	2	1	1	
Understand	6	2	1	
Apply	6	2	1	
Analyze	6	2	1	
Evaluate	2	1	1	
Create	3	2		

SEE: Semester End Examination (50 Marks)

Bloom's Category	Tests
Remember	4
Understand	10
Apply	11
Analyze	11
Evaluate	4
Create	10

BASIC ELECTRONICS

Course Code	: ECE15/25	**Credits CIE**	: 04
L:P:T:S	: 3:0:1:0	**Marks**	: 50
Exam Hours	: 03	**SEE Marks**	: 50

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

CO1	Employ Boolean algebra to implement the combinational logic circuits.
CO2	Identify the diode's usage as a rectifier, and Zener diode's usage as an voltage regulator.
CO3	Discuss the basic characteristics of BJT and MOSFET.
CO4	Examine the BJT's voltage-divider bias circuit, and illustrate its operation as an amplifier.
CO5	Describe the characteristics of op-amp and illustrate its various applications.
CO6	Discuss about Microprocessors, Microcontrollers and recognize their needs.

Mapping of Course Outcomes to Graduate Attributes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1	1	1	1	-	3	3	1	2
CO2	3	3	2	1	1	2	1	-	1	2	2	1
CO3	3	2	1	2	1	-	-	-	1	1	-	-
CO4	3	3	3	2	1	2	2	2	1	2	1	1
CO5	3	2	3	2	1	2	2	-	1	2	2	1
CO6	3	2	2	3	2	3	3	2	2	3	2	3

Course Syllabus			
Sl no	**Contents of Module**	**Hrs**	**COs**
1	**Digital Electronics:** 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 Simplification, NAND and NOR Implementation.	9	CO1
2	**Semiconductor Diodes and Applications:** P-N Junction diode – its principle, characteristics and parameters, Applications (Half-Wave Rectifier, Two-Diode Full Wave Rectifier, Bridge Rectifier), (Zener diode and its usage as voltage regulator). **Bipolar Junction Transistor:** BJT Operation, BJT Voltages and Currents, Common Emitter Characteristics, Numerical examples as applicable.	9	CO2, CO3

3	**BJT Biasing:** DC load line, Need for biasing, Voltage divider bias, Numerical examples as applicable. **Amplifiers:** 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. **MOSFET:** Introduction to MOSFET theory, Operation and characteristics, Types of MOSFET, Comparison between BJT and MOSFET.	9	CO4
4	**Operational Amplifier & its Applications:** Characteristics (Ideal Op-amp, Practical Op-amp), Inverting and Non-inverting Amplifier, Voltage follower, Summing Amplifier and Subtractor, Numerical examples as applicable. **Oscillators:** Basic feedback theory, Positive and Negative feedback, Concept of Stability, Introduction to Oscillators, RC phase shift oscillator. **Communication System:** Principles of Communication System, Need for Modulation, AM and FM Modulation concept, Modulation index, Numerical examples.	9	CO5
5	**Building blocks of a Digital system:** Half Adder, Full Adder, Encoder, Decoder, Latch, Flip-Flop, Registers. Introduction to Microprocessors, General operation of Microprocessors, 8085 Microprocessor architecture and working principle. Introduction to Microcontrollers, 8051 Microcontroller architecture and operation, Comparison between Microprocessors and Microcontrollers.	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, 5th Edition, 2008, Oxford University Press.

2. Digital Logic and Computer Design, M. Morris Mano, 5th edition, 2002, PHI.

Reference Books:

1. Op-amps and linear integrated circuits, Ramakant A. Gayakwad, 4th edition, 2000, Prentice Hall.
2. Electronic communication systems, Wayne Tomasi, 5th edition, 2001, Pearson education.
3. Microprocessor Architecture, Programming and Applications with 8085, Ramesh Gaonkar, 6th Edition, 2013, Prentice Hall.
4. The 8051 Microcontroller and Embedded Systems using Assembly and C, Muhammad Ali Mazidi, 2nd Edition, 2011, Pearson.

Assessment Pattern

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Tests (25 Marks)	Assignments (10 Marks)	Quizzes (5 Marks)	External Co-curricular participation (10 Marks)
Remember	5		-	-
Understand	10	5	-	-
Apply	5	5	5	10
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 : HSS161/261	**Credits : 02**	
L: P: T: S : 2:0:0:0	**CIE Marks : 25**	
Exam Hours : 02 Hours	**SEE Marks : 25**	

Course Outcomes: On completion of the Course, the student will be able to:

CO1	Understand the concept of environment, natural resources, global environmental issues, environmental acts and amendments
CO2	Develop an insight into ecology, water resources, forest resources, energy resources and Swachh Bharat Abhiyaan.
CO3	Understand the consequences & control measures of environmental pollution and fluoride problem in drinking water.
CO4	Apply the knowledge of a balanced ecosystem, alternate energy resources, sustainable development and environmental ethics for the betterment of the society.

Mapping of Course Outcomes to Program Outcomes:

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

Modu le No	Contents of the module	Hrs	COs
1	**Introduction to Environment and Ecology** Environment - Components of Environment, Scope and importance of Environmental science, Ecology &Ecosystem: Types & Structure of Ecosystem, ecological pyramids, balanced ecosystem, food chain and food web.	05	CO1 CO2 CO4
2	**Natural Resources** Introduction, Water resources – Availability & Quality aspects, Water borne diseases; Fluoride problem in drinking water, Mineral resources, Forest resources. Concept of sustainable development.	04	CO1 CO2 CO3 CO4
3	**Energy resources** 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.	04	CO2 CO4

4	**Environmental Pollution and impact of human activities** Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Land Pollution and Noise pollution. Environmental impacts of agriculture, housing and transportation. Global warming, climate change, acid rain and ozone layer depletion.	05	CO1 CO3
5	**Environmental Acts and Central Government Projects** Environmental Acts and amendments, environmental ethics, awareness about environmental protection, Role of government: Swachh Bharat Abhiyaan, National Mission for Clean Ganga (NMCG), Role of Nongovernmental Organizations (NGOs).	04	CO1 CO2 CO4

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).
3. Environmental studies by Benny Joseph, Tata McGraw-Hill Education, 2005 Edition

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 thEdition (ISBN-10: 0534424082).

4. Elements of Environmental Science and Engineering by P. Meenakshi, PrenticeHall of India Pvt. Ltd, 2005 Edition (ISBN- 8120327748, 9788120327740).

CIE- Continuous Internal Evaluation (25 Marks):

Bloom's Taxanomy Levels	Tests (20)	Assignment/Mini Project (5)
Remember	05	0
Understand	10	05
Apply	05	0
Analyze	0	0
Evaluate	0	0
Create	0	0

SEE – Semester End Examination (25 Marks):

Bloom's Taxanomy Levels	Tests
Remember	05
Understand	15
Apply	05
Analyze	0
Evaluate	0
Create	0

ESSENTIAL ENGLISH (Mandatory Course)

Course Code	**: HSS171/271**	**Credits**	**: 02**
L:P:T:S	**: 2:0:0:0**	**CIE Marks**	**:25**
Exam Hours	**: 02**	**SEE Marks**	**:25**

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

CO1	Grasp the ability to comprehend the meaning/vocabulary and use language in the most appropriate manner
CO2	Enhance competencies in written and oral communication skills

Mapping of Course Outcomes to Program Outcomes:

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

Module	Contents of the Module	Hours	COs
1	Introduction to English Grammar, Importance of Grammar, Parts of Speech, Usage of Prepositions, Articles, Wh Questions, Punctuation, One Word Substitution **Practice Session:** Speaking: Speaking about one's place, important festivals etc- Introducing oneself, one's family/friend/. Reading- Skimming a passage, Scanning for specific information, Free writing on a given topic (My favourite place/hobbies/college life) Email writing.	05	CO1,C02
2	Tenses and Degrees of Comparison, Active and Passive Voice, Vocabulary Building **Practice Session**: Listening- Listening and responding to video lecture/talks. Speaking – Describing a simple process (filling up of forms) Asking and answering questions- Telephone skills-Telephone etiquette.	05	C01,C02
3	Subject Verb Agreement, Idioms and Phrases, Homonyms, Homophones, spelling- Writing- Jumbled sentences **Practice Session**: Listening – Listening to a specific task, Speaking- Role play – Simulation- Group Interaction- speaking in formal situations (teachers and officials)	04	C01,C02
4	Collocations, Common errors In English, Dialogue Writing, Direct and Indirect speech **Practice Session:** Listening – watching videos/documentaries and responding to questions based on them. Role play to improve Dialogues.	04	C01,C02
5	Essay Writing, Creative writing. **Practice Session:** Topics will be given to improve writing skills	04	C01,C02

Text Books:

1. Grammar Practice Activities- Penny Ur, Cambridge University Press
2. Grammar Builder Level 1 to Level 5 Paperback – Import, 10 Mar 2005 byAdibah 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 Pattern:

CIE- Continuous Internal Evaluation (25 Marks)

Bloom's Category	Tests	Assignments	Presentation
Marks(out of 25)	10	10	5
Remember	1	-	-
Understand	2	-	-
Apply	3	5	-
Analyse	2	-	-
evaluate	-	-	-
create	2	5	5

SEE – Semester End Examination (50 Marks)

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

PHYSICS CYCLE

ENGINEERING MATHEMATICS – II

Course Code: MAT21   **Credits: 05**
L:P:T:S: 4:0:1:0   **CIE Marks : 50**
Exam Hours: 03   **SEE Marks: 50**

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

CO1	Understand ordinary differential equations and their applications
CO2	Formulate real world problems using partial differential equations
CO3	Apply the concepts of integration of functions of two/three variables over a region
CO4	Apply the basic concepts of Laplace transforms to electrical circuit analysis
CO5	Solve initial and boundary value problems using Laplace transform and also find the response of the system using Laplace transform method

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2	-	-	-	1	1	-	2
CO2	3	3	3	3	3	-	-	-	2	2	-	1
CO3	3	2	2	1	2	-	-	-	1	1	-	2
CO4	2	3	3	2	3	-	-	-	1	2	-	2
CO5	3	2	2	2	3	-	-	-	1	1	-	2

Course Syllabus			
Module No.	**Contents of the Module**	**Hours**	**Cos**
1	**Linear differential equations of second and higher order:** Solution of second and higher order differential equations. Solution of Cauchy's and Legendre's linear differential equations and variation of parameters method.	9	CO1
2	**Partial Differential equations:** Formation of partial differential equation by eliminating arbitrary constants and functions**.** Solution of non-homogeneous partial differential equation by direct integration and homogeneous partial differential equation involving derivative with respect to one independent variable. **Applications:** Derivation of one dimensional heat and wave equations and Various possible solutions of heat, Laplace and wave equations by variable separable method.	9	CO2
3	**Integral Calculus:** Problems on Double and triple integrals, evaluation of double integrals by changing the order of integration and changing into polar coordinates. Definitions of Beta and Gamma functions, Relation between beta and gamma functions and simple problems. **Applications:** Applications of double and triple integrals to find area and volume.	9	CO3
4	**Laplace Transform :** Definition and Laplace transforms of standard functions. Properties of Laplace transforms: Shifting properties, $t^n f(t)$, $\frac{f(t)}{t}$ forms. Laplace transform of derivatives and integrals (without proof), evaluation of definite integrals using Laplace transforms. Periodic functions, unit-step function and Impulse function-Problems.	9	CO4, CO5
5	**Inverse Laplace Transforms:** Inverse Laplace Transform by partial fractions, completing the square method, logarithmic and inverse trigonometric functions, Convolution theorem (without proof), initial and final value Theorem. **Applications of Laplace Transform :** Solution of linear differential equations and LCR Circuit.	9	CO4, CO5

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley-India Publishers, 10th Edition, 2014, ISBN: 978-81-265-5423-2.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014, ISBN: 978-81-7409-195-5.

Reference Books:

1. Glyn James, Modern Engineering Mathematics, Prentice Hall, 4th Edition, 2015, ISBN: 978-0-273-73409-3

2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education (India) Private Limited, 4th Edition, 2016, ISBN: 978-0-07-063419-0.

3. H. K. Dass, Advanced Engineering Mathematics, S. Chand & Company Ltd., 28th Edition, 2012, ISBN: 81-219-0345-9.

4. N.P.Bali and Manish Goyal, A Text Book of Engineering Mathematics, LaxmiPublications (P) Ltd., 9th Edition, 2014, ISBN: 978-81-318-0832-0.

Assessment Pattern:

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

Bloom's Category	Tests (25 Marks)	Assignments (10 Marks)	Quizzes (5 Marks)	External Co-curricular participation (10 Marks)
Remember	5	5	-	-
Understand	5	5	-	-
Apply	5	-	5	10
Analyze	5	-	-	-
Evaluate	5	-	-	-
Create	-	-	-	-

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

Bloom's Category	Questions (50 Marks)
Remember	10
Understand	10
Apply	20
Analyze	5
Evaluate	5
Create	-

ENGINEERING PHYSICS

Course Code : PHY12/22   **Credits CIE** : 05
L:P:T:S : 3:1:0:1   **Marks SEE** : 50+25
Exam Hours : 03   **Marks** : 50+25

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

CO1	Understand the basic concepts of physics as applied to different branches of Engineering and Technology.
CO2	Understand the fundamental concepts of optics using Lasers, optical fibers and their Applications
CO3	Comprehend the underlying principles of dielectrics, magnetic, semiconducting and advanced engineering materials for various applications.
CO4	Apply scientific methods and make use of the experimental methods to verify theoretical concepts.
CO5	Possess the ability to analyze, formulate and solve problems

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	2	1	-	1
CO2	3	2	-	-	-	-	-	-	2	1	-	1
CO3	3	2	-	-	-	-	-	-	2	1	-	1
CO4	3	2	-	-	2	-	-	-	2	1	-	1
CO5	3	3	2	1	1	-	-	-	1	1	-	1

Course Syllabus			
Module No.	**Contents of the Module**	**Hours**	**Cos**
1	**Modern Physics :** Introduction, dual nature of light, dual nature of matter, de-Brogile hypothesis, matter waves and their characteristic properties , Phase velocity, Group velocity, derivation of relation between group velocity an particle velocity, derivation of de-Broglie wavelength from the concept of Group Velocity, Scanning Electron Microscope **Quantum Mechanics**: Heisenberg's uncertainty principle - statement, significance , application(broadening of spectral lines), wave function, Physical significance of wave function, setting up of Schrodinger Time Independent wave equation in 1 dimension , Eigen values and Eigen functions, Application - Particle in a box (one dimensional) and free particle.	9	CO1 CO4 CO5
	List of Experiments 1. Determination of Planck 's constant using LED 2. Stefan's Law: To verify Stefan's Law	6	
2	**Dielectric Properties:** Dielectric constant, polarization, types, Polarizability, Internal field (Expression for One dimensional solid), Clausius -Mossotti equation (Derivation) – Dielectric loss, Dielectric relaxation, Temperature and frequency dependence of Polarizability, ferroelctrics, application of dielectric materials. **Magnetic Properties:** Introduction, Origin of magnetic moment, Classification of Magnetic materials (dia, para, ferro), Ferromagnetic Domain theory, B-H curve, Soft and hard magnetic materials, application in magnetic storage.	9	CO1 CO3 CO4 CO5
	List of Experiments 1. B - H Curve: To draw the B – H curve and to determine the coercivity and retentivity of the given ferromagnetic material 2. Dielectric constant**:** To determine the dielectric constant of given dielectric by charge and discharge method	6	
3	**Lasers:** Introduction, comparison of Laser and ordinary light, Interaction of radiation with matter, comparison of Spontaneous and stimulated emission, Einstein's A and B coefficients, expression for energy density at thermal equilibrium, conditions and requisites of Laser, characteristics of laser, Types - Nd:YAG laser, CO_2 laser, and their applications. **Fiber Optics**: Principle and propagation of light in optical fibers, fabrication of optical fibers: double crucible method, Numerical aperture and Acceptance Angl Types of optical fibers (material, refractive index, mode), attenuation , Application of optical fibers : Fiber Optical Communication system (Block diagram) , Active fiber sensors (Temperature sensor).	9	CO1 CO2 CO4 CO5

		List of Experiments		
		1. Laser Diffraction : To determine the wavelength of Laser using grating 2. Numerical Aperture: To determine the numerical aperture of Optical Fiber	6	
4		**Semiconductor Physics:** Introduction (basic definitions such as fermi energy, femi factor, density of states), Types (Purity, band gap), conductivity in an intrinsic semiconductor , derivation for carrier concentration in intrinsic semiconductor(N_e, N_h), expression for intrinsic carrier concentration n_i, from Law of mass action, expression for position of Fermi level in Intrinsic semiconductors , graphical discussion of variation of fermi level with temperature and concentration in **n** and **p** type semiconductors, Hall Effect and expression for Hall coefficient in n and p type semiconductors(derivation) -applications of Hall effect	9	**CO1 CO3 CO4 CO5**
		List of Experiments 1. Fermi Energy: To determine the Fermi energy of copper. 2. Photodiode Characteristics: To study the V-I characteristics of photo diode for different light intensity in reverse bias condition 3. Zener Diode Characteristics: To study the V-I characteristics of Zener diode and the reverse Zener break down voltage 4. Transistor Characteristics: To study the input and output characteristics of a Transistor in CE configuration and find the gain factor. 5. Energy Gap: To find the energy gap of a given semiconductor. 6. Hall Effect: To measure Hall Coefficient of materials.	15	
5		**Crystal structure:** Review, Unit cell, Bravais lattice, Seven crystal systems, Miller indices, Interplanar distance-derivation(for a cubic system), SC, BCC, FCC : n, coordination number, APF, Perovskite structure – a qualitative discussion Braggs law, Braggs X-ray diffractometer. **Modern Engineering Materials**: Introduction, Nanomaterials: properties, synthesis approach, PVD, Applications. Composites – Definition, Classification and application, Graphene: properties and application, Biomaterials: Classification of Biomaterials and its applications.	9	**CO1 CO3 CO4 CO5**
		List of Experiments 1. Determination of lattice parameters using Powder Diffraction pattern.	3	

*Lab: Minimum 10 experiments to be conducted 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 [th] Edition, 2011, DhanpatRai Publishers
3. Engineering Physics, D K Bhattacharya, poonam Tandon, Oxford university Press, 2015.

Reference Books

1. Engineering Physics, B. K. Pandey and S. Chaturvedi,1st edition, 2012, Cengage Publication
2. Solid State Physics, C Kittel, 8th Edition, 2012, Wiley International
3. Concepts of Modern Physics, Arthur Beiser, 6th Edition, 2009, Tata McGraw Hill,
4. A Textbook of Solid State Physics, S.O. Pillai, 6th Edition, 2010,New Age International
5. Engineering Physics, S. Mani Naidu, 2014, Pearson Publication

Assessment Pattern

CIE- Continuous Internal Evaluation Theory (50 Marks)

Bloom's Category	Tests	Assignment	Quiz	External Co-curricular participation (10 Marks)
Marks (out of 50)	25	10	5	10
Remember	5		02	
Understand	10	04	02	03
Apply	10	06	01	03
Analyze				04
Evaluate				
Create				

CIE- Continuous Internal Evaluation Lab(25 Marks)

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

SEE- Semester End Examination Theory (50 Marks)

Bloom's Category	Marks Theory(50)
Remember	10
Understand	25
Apply	15

SEE- Semester End Examination Lab (25 Marks)

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

ELEMENTS OF MECHANICAL ENGINEERING

Course Code: MEE13/23   **Credits: 05**
L:P:T:S   : 3:1:0:1   **CIE Marks: 50+25**
Exam Hours: 03   **SEE Marks: 50+25**

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

CO1	Understand the differences between conventional and non conventional energy sources .
CO2	Analyse the types of IC Engines and solve problems related to IC Engines.
CO3	Understand the working of different types of machines used in manufacturing.
CO4	Apply the concepts of machining for product development.
CO5	Apply the concepts and properties of Engineering materials for specific applications.
CO6	Create useful mechanical models by applying various fabrication methods.

Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	1	-	2	3	-	-	-	-	1
CO2	3	-	3	3	-	-	3	-	-	-	-	1
CO3	2	1	-	-	2	-	2	-	-	-	-	1
CO4	3	2	-	2	2	-	-	-	-	-	-	1
CO5	3	3	-	2	-	-	-	-	-	-	-	1
CO6	3	3	3	3	1	3	3	-	3	3	3	1

	Course Syllabus		
Module No	**Contents of Module**	**Hrs**	**Cos**
1	**Energy and its Importance:** Definition, classification based on long term availability, commercial applications, traditional use and Usability. **Conventional energy sources and their conversion**: 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. **Non Conventional energy sources and their conversion** Solar energy: Introduction, Heliochemical, helioelectrical and heliothermal process, Wind Energy: Schematic diagram of windmill, advantages and disadvantages of wind energy. **Geothermal Energy Conversion**: Open cycle – working principle, closed cycle – working principle, advantages and disadvantages	10	C01
	List of Experiments: 1. Introduction to development of lateral surfaces, types ,section plane concepts 2. Development of regular pentagonal, square &hexagonal prism	6	
2	**Internal Combustion Engines**: 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. **Refrigeration and Air-Conditioning**: 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	10	CO2, CO3
	List of Experiments: 1. Development of truncated right circular cone& frustum of cone 2. Development of pyramid& frustum of pyramid	7	
3 3	**Lathe and Drilling Machines**: **Lathe:** 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 **Drilling machine**: Classification of drilling machines, Specification of radial drilling machine, Twist drill and its nomenclature, Bench drilling,	8	CO3, CO4

	machine and radial drilling machine, drilling machine operations: drilling, boring, reaming, tapping, counter sinking and counter boring		
	List of Experiments: 1. Development of cylinders and truncated cylinders 2. Model 1 & 2-Truncated and frustum of cone	6	
4	**Milling machine:** 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. **Grinding machine**: Classification of grinding machine and operation of grinding machine, types of grinding machines: Surface, Cylindrical and Center less grinding machine. **Finishing and other processes**: Lapping and Honing operations – Principles, types and applications.	8	CO3, CO4
	List of Experiments: 1. Model 3 &4-Truncated & frustum of a square pyramid 2. Model- 5& 6-Prism & funnel	7	
5	**Engineering Materials**: 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 **Composite Materials**: Introduction: definition, classification, different types of fabrication and applications. **Joining Processes**: Permanent Joints: Soldering, Brazing and Welding: Definitions, classification and method of soldering, Brazing and welding. Differences between soldering, brazing and Welding	8	CO4, CO5, CO6
	List of Experiments: 1. Welding: Introduction, types of welding, Model 1,2,3 2. Brazing: Introduction and Model	7	

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 Promotors 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	Assignment	Quiz	External Co-curricular participation (10 Marks)
Marks (out of 50)	**25**	**10**	**5**	**10**
Remember				
Understand	10			5
Apply	5	5	5	
Analyze	5	5		5
Evaluate	5			
Create				

CIE- Continuous Internal Evaluation for lab (25 Marks)

Bloom's Category	Tests	Assignments	Quizzes/Viva
Marks(out of 25)	**10**	**10**	**05**
Remember	2	2	01
Understand	2	2	01
Apply	2	2	
Analyze	2	2	01
Evaluate	2		01
Create		2	01

SEE: Semester End Examination (50 Marks)

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

SEE – Semester End Examination (25 Marks - Lab)

Bloom's Category	Tests(theory)
Remember	5
Understand	5
Apply	4
Analyze	3
Evaluate	3
Create	5

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

ELEMENTS OF CIVIL ENGINEERING

Course Code :   **CIV14/24**

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

Exam Hours   : 3 Hours

Credits CIE   **: 04**

Marks SEE   **: 50**

Marks   **: 50**

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

CO1	Understand action of forces, moments and other loads on systems of rigid bodies
CO2	Determine the reactive forces and the effects due to external loads
CO3	Locate the centroid and compute the moment of inertia of regular cross sections
CO4	Express the relationship between the motion of bodies and analyze simple determinate trusses

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	2	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1

Module No	Contents of Module	Hrs	Co's
1	(A) 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
	(B) 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 of forces, Resolution of forces.	6	
2	(A) 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.	4	CO1, CO2
	(B) 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.	4	
3	(A) 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	CO2, CO3
	(B) 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	
4	(A) 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.	5	CO3, CO4
	(B) 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.	4	
5	(A) **Kinetics-** Newtons second law of motion and D'Alemberts principle for rectilinear motion of a particle, Numerical problems.	4	CO4

	(B) **Kinematics** Definitions, Displacement, average velocity Instantaneous velocity Speed– Acceleration - Average acceleration – Variable acceleration, Acceleration due to gravity – Newton's Laws of Motion.	**5**	

TEXT BOOKS

1. Elements of Civil Engineering and Engineering Mechanics by M.N. Shesha Prakash and Ganesh. B. Mogaveer, PHI Learning, 3rdRevised edition (2014)
2. Engineering Mechanics-Statics and Dynamics by A Nelson, Tata McGraw Hill Education Private Ltd, New Delhi, 2009.
3. Elements of Civil Engineering (IV Edition) by S.S. Bhavikatti, New Age International Publisher, New Delhi, 3rd edition 2009

REFERENCE BOOKS

1. Engineering Mechanics by S.Timoshenko,D.H.Young, and J.V.Rao, TATA McGraw-Hill Book Company, New Delhi.
2. Beer FP and Johnson ER, "Mechanics for Engineers- Dynamics and Statics"- 3rd SI Metric edition, Tata McGraw Hill. – 2008.
3. Shames IH, "Engineering Mechanics – Statics & Dynamics"- PHI – 2009.

CIE Continuous Internal Evaluation (Theory 50 Marks)

Blooms Category	Tests	Assignment	Quiz	External Co-curricular participation (10 Marks)
Marks out of 50	25	10	5	10
Remember	2	1	1	
Understand	7	3	2	
Apply	13	4	2	
Analyse	3	2	-	
Evaluate	-	-	-	
Create	-	-	-	

SEE-Semester End Examinations (Theory 50 Marks)

Blooms Category	**Marks**
Remember	10
Understand	10
Apply	20
Analyze	10

Percentage Evaluation of Various Bloom's levels

Bloom's Category	CIE	SEE	TOTAL	%
Remember	5	10	15	15
Understand	14	10	24	24
Apply	22	20	42	42
Analyze	9	10	19	19
Evaluate	-	-	-	-
Create	-	-	-	-
TOTAL	**50**	**50**	**100**	**100**

BASIC ELECTRICAL ENGINEERING

Course Code : EEE15/25		**Credits**	04
L:P:T:S : 3:0:1:0		**CIE Marks**	: 50
Exam Hours : 03		**SEE Marks**	: 50

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

CO1	Solve DC and AC electric circuit problems by applying basic electric circuit laws and analysis techniques
CO2	Demonstrate the knowledge on the construction and basic principles of operation of various electrical equipment
CO3	Design domestic wiring and understand the precautionary measures required against electric shocks
CO4	Demonstrate knowledge on the basic working principles and the differences between single, two-phase and poly phase systems.
CO5	Demonstrate the understanding of the construction, basic working principle and efficiency of a single phase transformer.

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	-	-	-	-	-	2	2	-
CO2	3	3	1	-	-	-	-	-	-	2	2	-
CO3	3	3	1	1	-	-	-	-	-	1	1	-
CO4	3	2	1	-	-	-	1	-	-	-	1	-
CO5	3	2	1	-	-	-	1	-	-	-	1	-

SYLLABUS			
Module	**Contents of the Module**	**Hour**	**COs**
1	**Electric Elements & Circuits Laws:** Charge and electric forces, voltage, current and magnetic forces. Ohms 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, units of work, power and energy and heating effects of electrical current **Circuit Analysis & Techniques:** Introduction to Superposition, Thevenin's and Norton's theorems. Maximum power transfer theorem (Only with independent sources and Resistive elements). Only theorem and proof (Problems excluded)	10	**CO1, CO3**
2	**Magnetic Fields:** Faradays law, Induced voltage. Dynamically Induced EMF and Statically Induced EMF, Self-induced EMF and Mutually Induced EMF, Self-inductance of a Coil, Mutual Inductance (all the laws associated), Energy Stored in a Magnetic Field, Energy Stored in a Capacitor. **Introduction to D.C Machines:** Principles and construction of D.C machines, EMF equation, classification of D.C. machines based on method of excitation, excitation and load characteristics of D.C generators, critical resistance, voltage regulations, speed and torque characteristics of D.C motors, applications.	10	**CO2, CO3**
3	**AC Circuits:** Sinusoidal source, maximum, average and RMS values, form factor, analysis of R, L & C circuits. Complex algebra and phasor diagrams. Reactance, susceptance, impedance and admittance. problems involving series, parallel and series – parallel circuits, Power trangle - Real power, reactive power, apparent power and Power factor. **Transformers:** 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.	10	**CO1, CO3, CO2, CO5, CO6**
4	**Three-Phase Circuits:** 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 Watt Meter readings. **Domestic wiring:** Brief discussion on concealed conduit wiring. Two-way and three-way control of lamps, Electric shock: precautions against shock, various circuit protective devices – fuses, MCB's ,Earthing – importance, pipe	7	**CO1, CO4, CO5**

5	**Induction Machines:** Three- phase induction motor, production of rotating magnetic field, construction and principles of operation, types of Rotor, E. M.F equation, slip and its significance, necessity of starter, applications . **Measuring Instruments:** Construction and Principle of operation of dynamometer type wattmeter and single phase induction type energy meter.	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 , 3rd edition, TMH, D.P.Kothari.

Assessment Pattern

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Tests	Assignment	Quiz	External Co-curricular participation(10 Marks)
Marks (out of 50)	**25**	**10**	**5**	**10**
Remember	10			
Understand	10		5	
Apply	5	10		
Analyze				

SEE- Semester End Examination (50 Marks)

Bloom's Category	Tests
Remember	10
Understand	10
Apply	30

PROFESSIONAL COMMUNICATION

Course Code : HSS162/262		**Credits**	: 02
L:P:T:S : 2:0:0:0		**CIE Marks**	:25
Exam Hours : 02		**SEE Marks**	:25

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

CO1	Understand the concept, process and importance of communication
CO2	Gain knowledge on different aspects 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	1	3	-	3
CO2	-	-	-	-	-	-	-	3	2	3	-	3
CO3	-	-	-	-	-	-	-	2	2	3	-	3
CO4	-	-	-	-	-	-	-	3	2	3	-	3

Module	Contents of the Module	Hours	COs
1	Types, purpose and definition of Communication process- 7Cs of Communication, Barriers of Effective communication and overcoming the barriers.	05	C01,C02, C03,C04
2	Non-verbal Communication (Body Language): Kinesics, Occulesics, Paralanguage, Proxemics, Artifactics, Chronemics & Tactilics , Presentation Skills and Body Language Across Different Cultures	05	CO1,CO2, C03,C04
3	Importance of Listening: Listening Vs Hearing, Types of Listening, Barriers of Listening and Traits of a good listener	02	CO1,CO2, CO3,CO4
4	The four main types of reading techniques-Skimming, Scanning, Intensive & Extensive reading	04	CO1,C02, C03,C04
5	Written Communication: Business Letter Writing, Job Application Letter , Email writing, CV's and Expansion of ideas, Report writing and Review/Progress Report Writing	06	CO1,C02, C03,C04

Text Books:

1. Basic Business Communication: Skills For Empowering The Internet Generation-Flatley and Lesikar, Tata McGraw Hill, 10th Edition, 2005.

2. Business and Professional Communication: Keys for Workplace Excellence- Kelly M. Quintanilla.

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

Reference Books:

1. The Skills of Communicating-Bill Scott-Jaico Books
2. Writing, Speaking, Listening-Helen Wilkie- Jaico Books
3. Technical communication- Principles and Practice –Meenakshi.R and Sangeetha Sharma, Oxford University Press-2007
4. Practical English Grammar- A.J Thomson and A.V Martivet, Oxford University Press- 1987

Assessment Pattern:

CIE- Continuous Internal Evaluation (25 Marks)

Bloom's Category	Tests	Assignments	Presentation
Marks(out of 25)	**10**	**10**	**5**
Remember	1	-	-
Understand	2	-	-
Apply	3	5	-
Analyse	2	-	-
Evaluate	-	-	-
Create	2	5	5

SEE – Semester End Examination (25 Marks)

Bloom's Category	Tests
Remember	3
Understand	5
Apply	5
Analyze	5
Evaluate	2
Create	5

CONSTITUTION OF INDIA & PROFESSIONAL ETHICS

Course Code	: HSS171/271	**Credits**	0
L: P: T: S	: 2:0:0:0	**CIE Marks**	25
Exam Hours	: 02	**SEE Marks :**	25

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

CO1	Understand the Constitution of India and Engineering Ethics
CO2	Able to solve the legal problems and professional ethical front.

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	1	-	3	1	-	-	1
CO2	-	-	-	-	-	1		3	1	-	-	1

Module No	Contents of Module	Hours	CO
1	**INTRODUCTION TO CONSTITUTION OF INDIA** Introduction to Constitution of India, The making and salient features of the Constitution, Preamble to Indian Constitution. Fundamental Right & Limitation, decided case studies Right to Information Act.	5	CO1 CO2
2	**DIRECTIVE PRINCIPLES OF STATE POLICY** Directive Principles of State Policy, Fundamental Duties, Union Executive – President, Prime Minister, Parliament and Supreme Court of India.	4	CO1 CO2
3	**STATE EXECUTIVE** State Executive- Governor, Chief Minister, State Legislature, High Court, Electoral Process in India, Amendment Procedure, 42nd44th,74th,76th,86th,91st Amendments.	4	CO1 CO2
4	**SPECIAL PROVISION** Special provision for SC & ST, special provision for women, children and backward classes, emergency provision, citizenship, National Human Right Commission**.**	4	CO1 CO2
5	**SCOPE & AIMS OF ENGINEERING ETHICS** Scope & Aims of Engineering ethics. Responsibility of Engineers, Impediments to responsibility. Risk, safety and liability of Engineers. Corporate Social responsibility.	5	CO1 CO2

Text Books:

1. Durga Das Basu: "Introduction to the Constitution of India"

2. Charles E.HRIES,Michael S Pritchard and Michael J. RObina "Engineering Ethics"
   Thompson Asia,2003-08-05

Reference Book:

1. M.Givindarajan, 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",PHILearning
Pvt.Ltd.,New
   Delhi,2011
3.K.R.Phaneesh Constitution of India & Professional Ethics-ninth edition 2014

CIE- Continuous Internal Evaluation   (25 Marks)

Bloom's Category	Test	Assignment
Marks	**20**	**05**
Remember	10	2
Understand	05	2
Apply	05	1

SEE- Semester End Examination (25 Marks)

Bloom's Category	Test
Marks	**25**
Remember	15
Understand	05
Apply	05