Course Title	Mathematics-I for Mechanical Engineering stream	**Semester**	I
Course Code	MVJ22MATM11	**CIE**	50
Total No. of Contact Hours	50 L : T : P :: 2 : 2 : 2	**SEE**	50
Course Type	Integrated	**Total**	100
Credits	4	**Exam. Duration**	3 Hours

Course objectives:

The goal of the course Mathematics-I for Mechanical Engineering stream is to

- Familiarize the importance of calculus associated with one variable and two variables for Mechanical engineering.
- Analyze Mechanical engineering problems applying Ordinary Differential Equations.
- Develop the knowledge of Linear Algebra referring to matrices.

Module-1	**L1, L2& L3**	**8 Hours**

Introduction to polar coordinates and curvature relating to Mechanical engineering.

Polar coordinates, Polar curves, angle between the radius vector and the tangent, and angle between two curves. Pedal equations. Curvature and Radius of curvature - Cartesian, Parametric, Polar and Pedal forms. Problems.

Self-study: Center and circle of curvature, evolutes and involutes.

Applications: Structural design and paths, Strength of materials, Elasticity.

Module-2	**L1, L2& L3**	**8 Hours**

Introduction to series expansion and partial differentiation in the field of Mechanical engineering applications. Taylor's and Maclaurin's series expansion for one variable (Statement only) – problems. Indeterminate forms - L'Hospital's rule, problems. Partial differentiation, total derivative - differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables - Problems.

Self-study: Euler's theorem and problems. Method of Lagrange's undetermined multipliers with single constraint.

Applications: Computation of stress and strain, Errors and approximations, Estimating the critical points and extreme values.

Module-3	**L1,L2 &L3**	**8 Hours**

Introduction to first-order ordinary differential equations pertaining to the applications for Mechanical engineering.

Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations - Integrating factors on $\frac{1}{N}\left(\frac{\partial M}{\partial y}-\frac{\partial N}{\partial x}\right)$ and $\frac{1}{M}\left(\frac{\partial N}{\partial x}-\frac{\partial M}{\partial y}\right)$. Orthogonal trajectories and Newton's law of cooling. Nonlinear differential equations: Introduction to general and singular solutions, Solvable for p only, Clairaut's equations, reducible to Clairaut's equations - Problems.

Self-Study: Applications of ODEs in Civil Engineering problems like bending of the beam, whirling of shaft, solution of non-linear ODE by the method of solvable for x and y.

Applications: Rate of Growth or Decay, Conduction of heat.		
Module-4	**L1,L2 & L3**	**8 Hours**
Importance of higher-order ordinary differential equations in Mechanical engineering applications. Higher-order linear ODEs with constant coefficients - Inverse differential operator, method of variation of parameters, Cauchy's and Legendre's homogeneous differential equations -Problems. **Self-Study:** Formulation and solution of Cantilever beam. Finding the solution by the method of undetermined coefficients. **Applications:** Oscillations of a spring, Transmission lines, Highway engineering.		
Module-5	**L1,L2 & L3**	**8 Hours**
Introduction of linear algebra related to Mechanical engineering applications. Elementary row transformation of a matrix, Rank of a matrix. Consistency and solution of a system of linear equations - Gauss-elimination method, Gauss-Jordan method and approximate solution by Gauss-Seidel method. Eigenvalues and Eigenvectors, Rayleigh's power method to find the dominant Eigenvalue and Eigenvector. **Self-Study:** Solution of a system of linear equations by Gauss-Jacobi iterative method. Inverse of a square matrix by Cayley- Hamilton theorem. **Applications:** Structural Analysis, Balancing equations.		

List of Laboratory experiments

1.	2D plots for Cartesian and polar curves
2.	Finding angle between polar curves, curvature and radius of curvature of a given curve
3.	Finding partial derivatives and Jacobian
4.	Applications to Maxima and Minima of two variables
5.	Solution of first-order ordinary differential equation and plotting the solution curves
6.	Solutions of Second-order ordinary differential equations with initial/boundary conditions
7.	Solution of a differential equation of oscillations of a spring/deflection of a beam with different loads
8.	Numerical solution of system of linear equations, test for consistency and graphical representation
9.	Solution of system of linear equations using Gauss-Seidel iteration
10.	Compute eigenvalues and eigenvectors and find the largest and smallest eigenvalue by the Rayleigh power method.

Course outcomes:	
CO1	apply the knowledge of calculus to solve problems related to polar curves.
CO2	learn the notion of partial differentiation to compute rate of change of multivariate functions.
CO3	analyze the solution of linear and nonlinear ordinary differential equations.
CO4	make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors.
CO5	familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB/

	PYTHON/SCILAB

Text Books:	
1	B.S. Grewal, “Higher Engineering Mathematics” Khanna Publishers, 43rd Edition, 2013.
2	Erwin Kreyszig, “Advanced Engineering Mathematics”, Wiley-India publishers, 10thedition,2014.
3	N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, 7th Ed., 2010.
4	B.V.Ramana: "Higher Engineering Mathematics" Tata McGraw-Hill, 2006.
5	H. K. Dass and Er. RajnishVerma: "Higher Engineering Mathematics",S. Chand publishing, 1stedition, 2011.

Assessment:

Assessment Details (both CIE and SEE):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the Theory SEE is 35% of the maximum marks (35 marks out of 100).The minimum passing mark for the Lab SEE is 35% of the maximum marks (18 marks out of 50).

A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (35 Marks out of 100) in the Theory semester-end examination(SEE),not less than 35% (18 Marks out of 50) in the Lab semester-end examination(SEE), and not less than 40% (40 Marks out of 100) in the Theory SEE and Lab SEE(Semester End Examination) taken together, and a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

The CIE marks for the theory component of the IC (Integrated Course) shall be 50 marks,for the theory quiz’s shall be 10 marks and for the laboratory component 50 Marks.

CIE for the theory component of the IC (Integrated Course):

Three Tests each of 50 Marks and Three Quiz's each of 10 marks; after the completion of the syllabus of 35-40%, 65-70%, and 100% respectively. Two Assignments (seminars/one field survey and report presentation/one-course project) and three quizzes totaling 50 marks. Total Marks scored (test + assignments + quiz’s) out of 100 shall be scaled down to 50 marks.

The minimum marks to be secured in CIE to appear for SEE shall be 20 (40% of maximum marks) in the theory component.

CIE for the practical component of the IC (Integrated Course):

The following components shall be considered for CIE of the Practical component of the

IC(Integrated Course)

1. **Weekly Evaluation (write-up evaluations)**:
On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. Each program shall be evaluated for 10 marks and it is distributed as the 6 marks are for conducting the experiment and 4 marks for preparation of the laboratory record. Finally the total marks will be averaged to 10 marks and then scaled to 30 marks.

2. Innovative Experiment:
On completion of every Innovative experiment/program in the laboratory, the students shall be evaluated and 10 marks shall be awarded.

3. CIE of Practical component:
The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 20 marks and viva-voce for 5 marks.

Marks of all experiments' write-ups and Innovative experiment are added and scaled down to 50 marks.

The laboratory test (duration 03 hours) at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to 10 marks.

Scaled-down marks of write-up evaluations, Innovative experiment and tests added will be CIE marks for the laboratory component of IC/IPCC for 50 marks.

The minimum marks to be secured in CIE to appear for SEE shall be 20 (40% of maximum marks)in the practical CIE component.

Theory Semester End Examination(SEE):

Theory SEE will be conducted by Institution as per the scheduled timetable, with common question papers for the subject (duration 03 hours). The question paper shall be set for 100 marks. The medium of the question paper shall be English. The duration of SEE is 03 hours. The question paper will contain two parts, namely PART-A for 20 Marks and PART-B for 80 Marks.The question paper will have 05 questions in PART-A and 10 questions in PART-B. Two questions per module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. Each question is set for 16 marks in PART-B.The students have to answer all the questions in PART-A. The students have to answer 5 full questions, selecting one full question from each module in PART-B. The student has to answer for 100 marks and marks scored out of 100 shall be proportionally reduced to 50 marks.

Practical Semester End Examination(SEE):

Practical SEE will be conducted by Institution as per the scheduled timetable, with common question papers for the subject (duration 03 hours). The question paper shall be set for 50 marks. The medium of the question paper shall be English. The duration of SEE is 03 hours.

in Practical component of SEE, The maximum of 02 questions is to be set, the total marks of all

questions should not be more than 50 marks.

The students have to answer 02 full questions for 50 Marks. Each of the two questions (with a maximum of 2 sub-questions), should have a mix of topics under the syllabus.

CO-PO Mapping												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	0	1	0	0	0	0	0	0	1	0
CO2	2	2	1	2	0	0	0	0	0	0	1	1
CO3	3	3	0	2	0	0	0	0	0	0	1	1
CO4	3	3	0	2	0	0	0	0	0	0	0	0
CO5	3	3	1	3	0	0	0	0	0	0	1	1

High-3, Medium-2, Low-1

Course Title	**Applied Chemistry for Mechanical Engineering stream**	Semester	I/II
Course Code	**MVJ22CHEM12/22**	**CIE**	50
TeachingHours/Week(L:T:P:S)	2:2:2:0	**SEE**	50
Course Type(Theory/Practical/Integrated)	Integrated	**Total**	100
Credits	4	**Exam.Duration**	3hrs
Total Hours of Pedagogy	40 hours Theory+10to12Lab slots		

- **Course objective is to:**
- **To enable students to acquire knowledge on principles of chemistry for engineering applicat ions.**
- **To develop an intuitive understanding of chemistry by emphasizing the related branches of e ngineering.**
- **To provide students with a solid foundation in analytical reasoning required to solve societal problems.**

Module-1	**L1,L2**	8Hrs.

Energy: Source ,Conversion and Storage

Fuels:

Introduction, calorificvalue, determination of calorific value using bomb calorimeter ,numerical problems on GCV and NCV.

Green fuels: Introduction, poweralcohol, synthesis and applications of biodiesel.

High energy fuels Production of hydrogen by electrolysis of water and its advantages **Energydevices:** Introduction, construction, working and applications of Photovoltaic cells, Li-ion battery and methanol-oxygen fuel cell.

Self-learning: Plastic recycling to fuels and its monomers or other useful products .

Module-2	**L1,L2**	8 Hrs.

Corrosion Science and Engineering

Corrosion

Introduction, electrochemical theory of corrosion,types of corrosion-differential metal,differential aeration(waterline and pitting) , stress corrosion (caustic embrittlement)

Corrosion control:

Metal coating-galvanization,surface conversion coating-anodization and cathodic protection sacrificial anode method.Corrosion testingby weight loss method.Corrosion penetration rate (CPR)-numerical problems.

Metal finishing: Introduction,technological importance. Electroplating:Introduction Electroplating of chromium (hard and decorative). Electrolessplating: Introduction ,electroless plating of nickel.

Self-learning: Factors affecting the rate of corrosion,**f**actors influencing the nature and Quality of electro deposit (Current density,concentration of metalion, pH and temperature)**.**

	L1,L2,L3	8 Hrs.
Module-3		

Macromolecules for Engineering Applications

Polymers:

Introduction, methods of polymerization (Condensation and Free radical), molecular weight; number average weight average molecular weight . Synthesis, properties and industrial applications of polyvinylchloride (PVC) and polystyrene.

Fibers: Introduction, synthesis, properties and industrial applications of Kevlar and Polyester

Plastics: Introduction,synthesis, properties and industrial applications of poly (methyl methacrylate) (PMMA) andTeflon.

Composites: Introduction,properties and industrial applications of carbon-based reinforced composites (graphene/carbonnano tubes as fillers) and metal matrix polymer composites

Lubricants:Introduction,classification,properties and applications of lubricants.

Self-learning: Biodegradable polymer: Introduction, synthesis, properties and applications of polylacticacid(PLA).

Module-4	**L1,L2,L3**	8Hrs.

Phase Rule and Analytical Techniques

Phase rule:

Introduction, defination of terms phase ,components, degree of freedom, phase rule equation .Phase diagram: Two component-lead-silver system.

Analytical techniques:

Introduction,principle,instrumentation of potentiometric sensors ;its application in the estimation of iron,Optical sensors (colorimetry);its application in the estimation of the copper,pH-sensor (Glass electrode);its application in the determination of pH of beverages.

Self-learning: Determination of viscosity of biofuel and its correlation with temperature

Module-5	**L1,L2,L3**	8Hrs.

Materials for Engineering Applications

Alloys:Introduction,classification,composition,propertiesandapplicationsofStainlessSteel,BrassandAlnico.

Ceramics:Introduction,classificationbasedonchemicalcomposition,propertiesandapplicationsofperovskites(Ca TiO_3).

Nanochemistry: Introduction,size-dependent properties of nanomaterial (surface area,catalytical and thermal),synthesis of nanoparticles bys ol-gel,and co-precipitation method .

Nanomaterials: Introduction,properties and engineering applications of carbon nanotubes and graphene.

Self-learning:Abrasives:Introduction,classification,propertiesandapplicationsofsilicon carbide(carborundum).

Reference Books:

1. Wiley Engineering Chemistry,Wiley India Pvt .Ltd. New Delhi,2013-2nd Edition.

2.	Engineering Chemistry,Satyaprakash & Manisha Agrawal, Khanna Book Publishing,Delhi
3.	A textBoo kofEngg.Chemistry,ShashiChawla,DhanpatRai&Co.(P)Ltd.
4.	AppliedChemistry,SunitaRattan,Kataria5.EngineeringChemistry,Baskar,Wiley
5.	EssentialsofPhysicalChemistry,Bahl&Tuli,S.ChandPublishing

PRACTICAL MODULE

A–Demonstration (anytwo) offline/virtual:

A1.Synthesis of polyurethane .

A2.Preparation of urea formaldehyde resin .

A3.Synthesis of iron oxide nanoparticles .

A4.Determination of acid value of biofuel .

B–Exercise(compulsorily any 4 to be conducted):

B1.Conductometric estimation of acid mixture .

B2.Potentiometric estimation of FAS using $K_2Cr_2O_7$.

B3.Determination of pKa of vinegar using pH sensor(Glass electrode) .

B4.Determination of rate of corrosion of mild steel by weight loss method .

B5.Estimation of total hardness of water by EDTA method .

C–Structured Enquiry (compulsorily any 4 to be conducted):

C1.Estimation of Copper present in electroplating effluent by optical sensor(colorimetry)

C2.Determination of Viscosity coefficient of lubricant (Ostwald'sviscometer)

C3.Estimation of iron in TMT bar by diphenylamine/external indicator method

C4.Estimation of Sodium present in soil/effluent sample using flame photometry

C5.Determination of Chemical Oxygen Demand (COD) of industrial waste water sample.

D–Open Ended Experiments(any two):

D1.Estimation of percentage of iron in steel

D2.Electroplating of desired metal on substrate

D3.Synthesis of biodiesel

D4.Synthesis of Aluminium Oxide nanoparticle

Course outcomes:

CO1	Identify the terms processes involved in scientific and engineering and applications
CO2	Explain the phenomena of chemistry to describe the methods of engineering processes
CO3	Solve the problems in chemistry that are pertinent in engineering applications
CO4	Apply the basic concepts of chemistry to explain the chemical properties and processes
CO5	Analyze properties and multi processes associated with chemical substances indisciplinary situations

Assessment Details (both CIE and SEE):

- The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.
- The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the Theory SEE is 35% of the maximum marks (35 marks out of 100).The minimum passing mark for the Lab SEE is 35% of the maximum marks (18 marks out of 50).
- A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (35 Marks out of 100) in the Theory semester-end examination(SEE),not less than 35% (18 Marks out of 50) in the Lab semesterend examination(SEE), and not less than 40% (40 Marks out of 100) in the Theory SEE and Lab SEE(Semester End Examination) taken together, and a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Continuous Internal Evaluation(CIE): The CIE marks for the theory component of the IC (Integrated Course) shall be 50 marks,for the theory quiz's shall be 10 marks and for the laboratory component 50 Marks.
- CIE for the theory component of the IC (Integrated Course): Three Tests each of 50 Marks and Three Quiz's each of 10 marks; after the completion of the syllabus of 35-40%, 65-70%, and 100% respectively. Two Assignments (seminars/one field survey and report presentation/one-course project) and three quizzes totaling 50 marks. Total Marks .
- scored (test + assignments + quiz's) out of 100 shall be scaled down to 50 marks. The minimum marks to be secured in CIE to appear for SEE shall be 20 (40% of maximum marks) in the theory component.

CIE for the practical component of the IC (Integrated Course):

- The following components shall be considered for CIE of the Practical component of the IC(Integrated Course)
- Weekly Evaluation (write-up evaluations): On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day.
- Each program shall be evaluated for 10 marks and it is distributed as the 6 marks are for conducting the experiment and 4 marks for preparation of the laboratory record.
- Finally the total marks will be averaged to 10 marks and then scaled to 30 marks.
- Innovative Experiment: On completion of every Innovative experiment/program in the laboratory, the students shall be evaluated and 10 marks shall be awarded.

CIE of Practical component:

- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report .
- Each experiment report can be evaluated for 20 marks and vivavoce for 5 marks. Marks of all experiments' write-ups and Innovative experiment are added and scaled down to 50 marks .
- The laboratory test (duration 03 hours) at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to 10 marks. Scaled-down marks of write-up evaluations, Innovative experiment and tests added will be CIE marks for the laboratory component of IC/IPCC for 50 marks

- The laboratory test (duration 03 hours) at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to 10 marks.
- Scaled-down marks of write-up evaluations, Innovative experiment and tests added will be CIE marks for the laboratory component of IC/IPCC for 50 marks.
- The minimum marks to be secured in CIE to appear for SEE shall be 20 (40% of maximum marks)in the practical CIE component.
- **Theory Semester End Examination(SEE):** Theory SEE will be conducted by Institution as per the scheduled timetable, with common question papers for the subject (duration 03 hours). The question paper shall be set for 100 marks.
- The medium of the question paper shall be English. The duration of SEE is 03 hours. The question paper will contain two parts, namely PART-A for 20 Marks and PART-B for 80 Marks.
- The question paper will have 05 questions in PART-A and 10 questions in PART-B. Two questions per module.
- Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. Each question is set for 16 marks in PART-B.The students have to answer all the questions in PART-A.
- The students have to answer 5 full questions, selecting one full question from each module in PART-B. The student has to answer for 100 marks and marks scored . out of 100 shall be proportionally reduced to 50 marks.

Practical Semester End Examination(SEE):

- Practical SEE will be conducted by Institution as per the scheduled timetable, with common question papers for the subject (duration 03 hours).
- The question paper shall be set for 50 marks.
- The medium of the question paper shall be English.
- The duration of SEE is 03 hours. in Practical component of SEE, The maximum of 02 questions is to be set, the total marks of all questions should not be more than 50 marks.
- The students have to answer 02 full questions for 50 Marks. Each of the two questions (with a maximum of 2 sub-questions), should have a mix of topics under the syllabus

Cos and POs Mapping												
	PO											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	**3**	**1**	**1**				**1**					
CO2	**3**	**1**	**1**				**1**					
CO3	**3**	**1**	**1**				**1**					
CO4	**3**	**1**	**1**				**1**					
CO5	**3**	**1**	**1**				**1**					

Course Title:	**Computer Aided Engineering Drawing (Common to All)**		
Course Code	**MVJ22CEDK13/23**	CIE Marks	50
Teaching Hour/Week (L:T:P:S)	2:0:2:0	SEE Marks	50
Total Hours of Teaching - Learning	40	Total Marks	100
Credits	03	Exam Hours	03

Course Learning Objectives:

CLO1: To understand the basic principles and conventions of engineering drawing
CLO2: To use drawing as a communication mode
CLO3: To generate pictorial views using CAD software
CLO4: To understand the development of surfaces
CLO5: To visualize engineering components

Teaching-Learning (General Instructions):

- Students should be made aware of powerful engineering communication tool –Drawing.
- Simple Case studies can be suitably selected by the teacher for hands on practice to induce the feel of fruitfulness oflearning.
- Appropriate Models, Power Point presentation, Charts, Videos, shall be used to enhance visualization before hands onpractice.
- For application problems use very generally available actual objects. (Example: For rectangular prism / object; matchbox, carton boxes, book, etc can be used. Similarly for othershapes)
- Use any CAD software for generating orthographic and pictorialviews.
- Make use of sketch book with graph sheets for manual / preparatorysketching

Module-1	L1,L2,L3	6 h

Introduction: ***for CIE only***

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, polylines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet and curves.

Orthographic Projections of Points, Lines and Planes:

Introduction to Orthographic projections: Orthographic projections of points in 1st and 3rd quadrants.

Orthographic projections of lines (Placed in First quadrant only).

Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon, and circular laminae (Placed in First quadrant only using change of position method).

Application on projections of Lines & Planes (For CIE only)

Module-2	L1,L2,L3	5 h

Orthographic Projection of Solids:

Orthographic projection of right regular solids (**Solids Resting on HP only**): Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes &Tetrahedron.

Projections of Frustum of cone and pyramids (For practice only, not for CIE and SEE).

Module-3	L1,L2,L3	5 h

Isometric Projections:
Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones and spheres. Isometric projection of combination of two simple solids.
Conversion of simple isometric drawings into orthographic views.
Problems on applications of Isometric projections of simple objects / engineering components.
Introduction to drawing views using 3D environment (For CIE only).

Module-4	L1,L2,L3	5 h

Development of Lateral Surfaces of Solids:
Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones resting with base on HP only.
Development of lateral surfaces of their frustums and truncations.
Problems on applications of development of lateral surfaces like funnels and trays.
Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct (For CIE Only)

Module-5	L2,L3,L4	5 h

Multidisciplinary Applications & Practice *(For CIE Only):*
Free hand Sketching; True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc
Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains, Ratchets, two-wheeler cart &Four-wheeler carts to dimensions etc
Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system using suitable software
Basic Building Drawing; Like, Architectural floor plan, basic foundation drawing, steel structures- Frames, bridges, trusses using Auto CAD or suitable software,
Electronics Engineering Drawings- Like, Simple Electronics Circuit Drawings, practice on layers concept.
Graphs & Charts: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.

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

- **CO 1.** Drawand communicate the objects with definite shape and dimensions
- **CO 2.** Recognize andDraw the shape and size of objects through different views
- **CO 3.** Develop the lateral surfaces of the object
- **CO 4.** Create a Drawing views using CAD software.
- **CO 5.** Identify the interdisciplinary engineering components or systems through its graphical representation.

Assessment Details (both CIE and SEE):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks) and that for SEE minimum passing marks is 35% of the maximum marks (18 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) takentogether.

Continuous Internal Evaluation (CIE)

- CIE shall be evaluated for max. marks of 100 and later the same shall be scaled-down to 50 marks as detailed below:
- CIE component should compriseofContinuous evaluation of Drawing work of students as and when the Modules are covered based onbelow detailedweightage.

Module	**Max. Marks Weightage**	**Evaluation Weightage in marks**	
		Computer display and print out (a)	**Sketching (b)**
Module 1	15	10	05
Module 2	20	15	05
Module 3	20	20	00
Module 4	20	20	00
Module 5	25	15	10
Total	**100**	**80**	**20**
Consideration of Class work		**Total of [(a) + (b)] = 100 Scaled down to 30 Marks**	

- At least one **Test** covering all the modules is to be conducted for 100 marks and evaluation to be based SEE pattern, and the same is to be scaled down to **20Mark**s.
- The final CIE = Class work marks + Test marks

Semester End Examination (SEE)

- SEE shall be conducted and evaluated for maximum marks 100. Marks obtained shall be accounted for SEE final marks, reducing it by50%
- Question paper shall be set jointly by both Internal and External Examiner and made available for each batch as per schedule. ***Questions are to be set preferably from TextBooks***.
- **Related to Module-1**:One full question can be set either from "***points & lines***" or "***planes***".
- Evaluation shall be carried jointly by both theexaminers.
- Scheme of Evaluation: *To be defined by the examiners jointly and the same shall be submitted to the university along with questionpaper.*
- One full question shall be set from each of the Module from Modules 1,2,3 and 4 as per the below tabled weightage details. ***However, the student may be awarded full marks, if he/she completes solution on computer display withoutsketch.***

Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Preparatory sketching (b)
Module 1	20	15	05
Module 2	30	25	05
Module 3	25	20	05
Module 4	25	20	05
Total	**100**	**80**	**20**
Consideration of SEE Marks		**Total of (a) + (b) ÷ 2 = Final SEE marks**	

Suggested Learning Resources:

Text Books

- *S.N. Lal, & T Madhusudhan*:, Engineering Visulisation, 1st Edition, Cengage,Publication
- *Parthasarathy N. S., Vela Murali*, Engineering Drawing, Oxford University Press,2015.

Reference Books

- *Bhattacharya S. K.*, Electrical Engineering Drawing, New Age International publishers, second edition 1998, reprint2005.
- *Chris Schroder*, Printed Circuit Board Design using AutoCAD, Newnes,1997.
- *K S Sai Ram* Design of steel structures, , Third Edition byPearson
- *Nainan p kurian* Design of foundation systems, Narosapublications
- *A S Pabla*, Electrical power distribution, 6th edition, Tata Mcgrawhill
- *Bhatt, N.D.*, *Engineering Drawing: Plane and Solid Geometry*, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.
- *K. R. Gopalakrishna, & Sudhir Gopalakrishna*: Textbook Of Computer Aided Engineering Drawing, 39thEdition, Subash Stores, Bangalore,2017

COs and POs Mapping (CO-PO mappings are only **Indicative)**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2			3	1		1	1	3		2
CO2	3	2			3	1		1	1	3		2
CO3	3	2			3	1		1	1	3		2
CO4	3	3			3	1	1		1	3		1
CO5	3	2			3				1	3		2

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

INTRODUCTION TO C PROGRAMMING			
Course Code	**MVJ22ESCK14E**	CIE Marks	50
Teaching Hours/Week(L:P: SDA)	2:0:2:0	SEE Marks	50
Total Hours of Pedagogy	40 Hours	Total Marks	100
Credits	03	Exam Hours	03

- **Course Learning objectives:**

1. Elucidate the basic architecture and functionalities of a Computer
2. Apply programming constructs of C language to solve the real-world problems
3. Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems
4. Design and Develop Solutions to problems using modular programming constructs such as functions and procedures

MODULE-1

Introduction to C: Introduction to computers, input and output devices, designing efficient programs. Introduction to C, Structure of C program, Files used in a C program, Compilers, Compiling and executing C programs, variables, constants, Input/output statements in C, Operators in C, Type conversion and typecasting.

RBT Level: L1, L2, L3, L4

Teaching-Learning Process	Chalk and talk method, Power Point Presentation, You tube videos, Brain storming, Activity based method, Seminar

MODULE-2

Decision control and Looping statements: Introduction to decision control, Conditional branching statements, iterative statements, nested loops, break and continue statements, goto statement.

RBT Level: L1,L2,L3,L4

Teaching-Learning Process	Chalk and talk method, Power Point Presentation, You tube videos, Brain storming, Activity based method, Seminar

MODULE-3

Functions: Introduction using functions, Function definition, function declaration, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive functions.
Arrays: Declaration of arrays, accessing the elements of an array, storing values in arrays, Operations on arrays, Passing arrays to functions, Two dimensional arrays, operations on two-dimensional arrays, two-dimensional arrays to functions, multidimensional arrays, Applications of arrays, case study with sorting techinques.

RBT Level: L1, L2, L3, L4

Teaching-Learning Process	Chalk and talk method, Power Point Presentation, You tube videos, Brain storming, Activity based method, Seminar

MODULE4

Introduction to strings: Reading strings, writing strings, summary of functions used to read and write characters. Suppressing input using a Scanset. **Strings:** String taxonomy, operations on strings, Miscellaneous string and character functions, arrays of strings. **RBT Level: L1, L2, L3, L4**	
Teaching-Learning Process	Chalk and talk method, Power Point Presentation, You tube videos, Brain storming, Activity based method, Seminar
MODULE5 **Pointers:** Understanding the Computer's Memory, Introduction to Pointers, Declaring Pointer Variables **Structures:** Introduction to structures, Unions. **RBT Level: L1, L2, , L3, L4**	
Teaching-Learning Process	Chalk and talk method, Power Point Presentation, You tube videos, Brain storming, Activity based method, Seminar

Assessment Details(both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% ofthe maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Three Unit Tests each of **50 Marks.**

Two assignments each of **50 Marks**

The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks.

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

1. The SEE question paper will be set for100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 50 marks. There will be two full questions (with a maximum off our sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.

The students will have to answer five full questions, selecting one full question from each module

Textbooks

1. Computer fundamentals and programming in c, "Reema Thareja", Oxford University, Second edition, 2017.

Reference Books:

1. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill.

2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India.

Course Learning Outcomes: After the completion of the course, students will be able to:

Sl. No.	Description	Blooms Level
CO1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.	Understand
CO2	Apply programming constructs of C language to solve the real world problem	Analyze
CO3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting	Analyze
CO4	Explore user-defined data structures like structures, unions and pointers in implementing solutions	Analyze
CO5	Design and Develop Solutions to problems using modular programming constructs using functions	Design and analyze

Program Outcomes for this Course:

Sl. No.	Description	POs
1	An ability to independently carry out research/investigation and development work to solve practical problems	PO1
2	An ability to write and present a substantial technical report/document	PO2
3	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program	PO3
4	An ability to create, select, apply appropriate techniques, resources and modern tools to solve complex engineering activities with an understanding of their limitations.	PO4
5	An ability to apply Professional ethics, responsibilities and norms of the engineering.	PO5
6	An ability to recognize the need to engage in independent and life-long learning in various Communication domain.	PO6

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	**1**	**1**	**1**	**2**	**1**	**1**
CO2	**1**	**1**	**1**	**2**	**1**	**1**
CO3	**2**	**1**	**2**	**2**	**1**	**1**
CO4	**1**	**1**	**1**	**2**	**1**	**1**
CO5	**1**	**1**	**1**	**2**	**1**	**1**

Course Title:	Introduction to Internet of Things (IOT)		
Course Code:	**MVJ22ETCK15E/H/25E/H**	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3-0-0-0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

Course objectives

- Understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.
- Understand the recent application domains of IoT in everyday life.
- Gain insights about the current trends of Associated IOT technologoes and IOT Anlaytics.

Teaching-Learning Process

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem with different circuits/logic and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding
9. Use any of these methods: Chalk and board, Active Learning, Case Studies

Module-1 (8 hours of pedagogy) L1,L2,L3

Basics of Networking: Introduction, Network Types, Layered network models

Emergence of IoT: Introduction, Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components

Textbook 1: Chapter 1- 1.1 to 1.3 Chapter 4 – 4.1 to 4.4

Module-2 (8 hours of pedagogy) L1,L2,L3

IoT Sensing and Actuation: Introduction, Sensors, Sensor Characteristics, Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuator Types, Actuator Characteristics.

Textbook 1: Chapter 5 – 5.1 to 5.9

Module-3 (8 hours of pedagogy) L1,L2,L3

IoT Processing Topologies and Types: Data Format, Importance of Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations, Processing Offloading.

Textbook 1: Chapter 6 – 6.1 to 6.5

Module-4 (8 ours of pedagogy) L1,L2,L3

ASSOCIATED IOT TECHNOLOGIES
Cloud Computing: Introduction, Virtualization, Cloud Models, Service-Level Agreement in Cloud Computing, Cloud Implementation, Sensor-Cloud: Sensors-as-a-Service.

IOT CASE STUDIES
Agricultural IoT – Introduction and Case Studies

Textbook 1: Chapter 10– 10.1 to 10.6; Chapter 12- 12.1-12.2

Module-5 (8 hours of pedagogy) L2,L3,L4

IOT CASE STUDIES AND FUTURE TRENDS
Vehicular IoT – Introduction
Healthcare IoT – Introduction, Case Studies
IoT Analytics – Introduction

Textbook 1: Chapter 13– 13.1; Chapter 14- 14.1-14.2; Chapter 17- 17.1

Course outcome (Course Skill Set)

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

CO1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT.
CO2	Classify various sensing devices and actuator types.
CO3	Demonstrate the processing in IoT.
CO4	Explain Associated IOT Technologoes
CO5	Illustrate architecture of IOT Applications

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Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

Three Tests each of 20 Marks**;**

- 1st, 2nd, and 3rd tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

  If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**

- The question paper shall be set for 100 marks. The medium of the question paper shall be English). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Sudip Misra, Anandarup Mukherjee, Arijit Roy, “Introduction to IoT”, Cambridge University Press 2021.

Reference:

2. S. Misra, C. Roy, and A. Mukherjee, 2020. Introduction to Industrial Internet of Things and Industry 4.0. CRC Press.
3. Vijay Madisetti and Arshdeep Bahga, “Internet of Things (A Hands-on-Approach)”,1st Edition, VPT, 2014.
4. Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013.

Web links and Video Lectures (e-Resources):

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- 1. https://nptel.ac.in/noc/courses/noc19/SEM1/noc19-cs31/

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Demonstare a sensor based application
- Demonstare a IoT based application for smart campus

COs and POs Mapping (Individual teacher has to fill up)

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

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

RENEWABLE ENERGY SOURCES			
Course Code:	MVJ22ETCK15H/25H	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

Course objectives

- To understand energy scenario, energy sources and theirutilization.
- To explore society's present needs and future energy demands.
- To Study the principles of renewable energy conversionsystems.
- To exposed to energy conservation methods.

Teaching-Learning Process

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective

1. Use pie chart showing distribution of renewable energy sources
2. Use wind turbine models
3. Use sun path diagrams

Module-1 (08 hours) L1,L2,L3

Introduction: Principles of renewable energy; energy and sustainable development, fundamentals and social implications. worldwide renewable energy availability, renewable energy availability in India, brief descriptions on solar energy, wind energy, tidal energy, wave energy, ocean thermal energy, biomass energy, geothermal energy, oil shale. Introduction to Internet of energy (IOE).

Module-2 (08 hours) L1,L2,L3

Solar Energy: Fundamentals; Solar Radiation; Estimation of solar radiation on horizontal and inclined surfaces; Solar radiation Measurements- Pyrheliometers, Pyrometer, Sunshine Recorder.Solar Thermal systems: Flat plate collector; Solar distillation; Solar pond electric power plant.

Solar electric power generation- Principle of Solar cell, Photovoltaic system for electric power generation, advantages, Disadvantages and applications of solar photovoltaic system.

Module-3(08 hours) L1,L2,L3

Wind Energy: Properties of wind, availability of wind energy in India, wind velocity and power from wind; major problems associated with wind power, Basic components of wind energy conversion system (WECS); Classification of WECS- Horizontal axis- single, double and muliblade system. Vertical axis- Savonius and darrieus types.

Biomass Energy: Introduction; Photosynthesis Process; Biofuels; Biomass Resources; Biomass conversion technologies-fixed dome; Urban waste to energy conversion; Biomass gasification (Downdraft) .

Module-4(08 hours) L1,L2,L3

Tidal Power: Tides and waves as energy suppliers and their mechanics; fundamental characteristics of tidal power, harnessing tidal energy, advantages and limitations.

Ocean Thermal Energy Conversion: Principle of working, OTEC power stations in the world, problems associated with OTEC.

Module-5 (08 hours) L2,L3,L4

Green Energy: Introduction, Fuel cells: Classification of fuel cells – H_2; Operating principles, ZeroenergyConcepts.Benefits of hydrogen energy, hydrogen production technologies (electrolysis method only), hydrogen energy storage, applications of hydrogen energy, problem associated with hydrogen energy.

Course outcome (Course Skill Set)

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

CO1	Describe the environmental aspects of renewable energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
CO2	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation.
CO3	Understand the conversion principles of wind and tidal energy
CO4	Understand the concept of biomass energy resources and green energy.
CO5	Acquire the basic knowledge of ocean thermal energy conversion and hydrogen energy.

Assessment Details (both CIE and SEE)

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Continuous Internal Evaluation(CIE):

Three Tests each of 20 Marks**;**

- 1st, 2nd, and 3rd tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

  If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

Semester End Examination (SEE):

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- The question paper shall be set for 100 marks. The medium of the question paper shall be English). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.

Suggested Learning Resources:

Text Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Nonconventional Energy sources, G D Rai, Khanna Publication, Fourth Edition,
2. Energy Technology, S.Rao and Dr. B.B. Parulekar, Khanna Publication.Solarenergy, SubhasPSukhatme, TataMcGrawHill, 2nd Edition,1996.

Reference Books:

1. Principles of Energy conversion, A. W. Culp Jr.,, McGraw Hill, 1996
2. Non-Convention EnergyResources, Shobh Nath Singh, Pearson, 2018

Web links and Video Lectures (e-Resources):

- E-book URL:https://www.pdfdrive.com/non-conventional-energy-sources-e10086374.html
- E-book URL:https://www.pdfdrive.com/non-conventional-energy-systems-nptel-d17376903.html
- E-book URL: https://www.pdfdrive.com/renewable-energy-sources-and-their-applications- e33423592.html
- E-book URL: https://www.pdfdrive.com/lecture-notes-on-renewable-energy-sources-e34339149.html
- https://onlinecourses.nptel.ac.in/noc18_ge09/preview

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Poster presentation on the theme of renewable energy sources
- Industry Visit

COs and POs Mapping (Individual teacher has to fill up)

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

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

CourseTitle	Communicative Skills in English-I	**Semester**	01
CourseCode	MVJ22ENGK16	**CIE**	50
TotalNo.ofContactHours	02	**SEE**	50
No.ofContactHours/week	35 hours	**Total**	100
Credits	01	**Exam.Duration**	3Hours

Course objective is to:

- To enhance their English vocabulary and language proficiency
- To communicate effectively and with self-confidence ,in any given situation
- To master the Functionalish grammar and essential language skills
- To identify the nuances of phonetics, intonation and enhance their pronunciation skills

Language Lab:

To augment LSRW and Gvskills (Listening,Speaking,Reading,Writing,GrammarandVocabulary)throughtests,activities,exercisesetc.via comprehensive web-based learning and assessment systems

Module-1	**RBTLevel L1L2L3**	**Hours 7hrs**

Syllabus Content:

IntroductiontoTechnicalCommunication

1.1 FundamentalsofCommunicationSkills

1.2 Barrierstoeffectivecommunication

1.3 Thehallmarkofeffectivecommunication

1.4 DistortioninCommunication

1.5 DifferentstylesinCommunication–FormalandInformal

1.6 TypesofCommunication–oral,written,non-verbal

1.7 InterpersonalCommunicationSkills

1.8 DevelopingInterpersonalSkills

1.9 Information Transfer:OralPresentation

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

https://youtu.be/-Y-R9hDI7IU

Module-2	RBTLevel L1L2L3	Hours 7hrs

SyllabusContent:

IntroductiontoListeningSkillsandPhonetics

1.1 IntroductiontoPhonetics

1.2 Phoneticsymbolsandtranscription

1.3 SoundsMispronounced

1.4 SpeechSounds:Vowels,ConsonantsandDiphthongs

1.5 SilentLetters

1.6 Themagic‘e’

1.7 HomophonesandHomonyms

1.8 AspirationandPronunciationof‘The’

1.9 ListeningComprehension

1.10 Articles:UseofArticles;commonerrorsintheuseofArticles

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

https://youtu.be/T8LXnYpqMc4https://youtu.be/adjaW0YSInUhttps://youtu.be/-8g_TKJ6oiw

Module-3	RBTLevel L1L2L3	Hours 7hrs

SyllabusContent:

DevelopingListeningSkills

1.1Importanceoflisteningincommunication

1.2.Techniquesforeffectivelistening

1.3 IncongruenciesinEnglishpronunciation

1.4 WordAccent-RulesforWordAccent,StressShift

1.5 Sentencestress

1.6 Standardpronunciation

1.7 Pluralforms

1.8 Questionformsandintonation.

1.9 Prepositions,andthosePrepositionsoftenconfused.

1.10 Prepositionalphrases

1.11 ListeningComprehension

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

https://youtu.be/-8g_TKJ6oiw

Module-4	**RBTLevel L1L2L3**	**Hours 7hrs**

SyllabusContent:

SpeakingSkillsandVocabulary-1

1.1 Vocabulary usedineverydaysituations.

1.2 Wordsformation-PrefixesandSuffixes

1.3 Contractions

1.4 Wordsoftenconfusing.

1.5 QuestionTags

1.6 Synonyms

1.7 Antonyms

1.8 SpellingRulesandWordsoftenMisspelt

1.9 The sequenceofTenses

VideoLinks/AnyotherspecialInformation(Papers):(Foradditionalstudyontheconceptsofcontents)

https://youtu.be/w1v3ddhojSs

Module-5	**RBTLevel L1L2L3**	**Hours 7hrs**

SyllabusContent:

SpeakingSkillsandVocabulary-2

1.1 ExtemporeSpeaking / PublicSpeaking–Guidelines

1.2 Overcoming fearsandinhibitions

1.3 Voicemodulation

1.4 MotherTongueInfluence(MTI)

1.5 TechniquesforNeutralization ofMotherTongueInfluence

1.6 ListeningComprehension

1.7 CommonErrorsinPronunciation

1.8 Speakingingivensituations–openinga bankaccount,visitingdoctor,attendinganinterview,gatheringinformation, making plans, making choices, congratulating, professing appreciation etc.

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

https://youtu.be/Y4TbGPhQ7Ikhttps://youtu.be/JIKU_WT0Bls

Courseoutcomes:	
CO1	UseEnglishthatisgrammaticallycorrectandidentifythenuancesofphonetics,intonationand flawlesspronunciation
CO2	EnhancetherepertoireofEnglishvocabulary
CO3	Identify commonerrorsinspokenandwritten communication
CO4	Understandandimprovenon-verbalcommunicationand kinesics
CO5	Performwithconfidenceatcampusrecruitment,engineeringandallothercompetitiveexaminations

Textbooks:	
1	**EnglishCommunicationMadeEasy**byChitraLaxman–SathyasriPrintersPvt.Ltd.
ReferenceBooks:	
1	**TechnicalCommunication**byGajendra SinghChauhanandEtal,CengagelearningIndiaPvt Limited[LatestRevisedEdition}-2018.
2	**CommunicationSkills**bySanjayKumarandPushpaLata,OxfordUniversityPress-2018
3	**HighSchoolEnglishGrammar&Composition**byWrenandMartin,SChandh&CompanyLtd.2015
4	**EnglishLanguageCommunicationSkills-LabManualcumWorkbook,**CengagelearningIndiaPvt. Limited[LatestRevisedEdition}-2018
5	**TechnicalCommunication-**PrinciplesandPractice,ThirdEditionbyMeenakshiRamanandSangeetha Sharron,OxfordUniversityPress2017
6	**EffectiveTechnicalCommunication-**SecondEditionbyMAshrafRizvi,McGrawHillEducation (India)PrivateLimited-2018

CIEAssessment:

CIEisbasedonquizzes,tests,assignments/seminarsandanyotherformofevaluation.Generally,therewillbe:TwoInternal Assessment(IA)testsduringthesemester(25markseach),thefinalIAmarkstobeawardedwillbetheaverageoftwotests.

-Assignmentsand activities (25marks)

SEEAssessment:

x. Question paper for the SEE consists of two parts i.e. Part A and Part B. Part A is compulsory and consists ofobjective questions of1 mark each fortotal of40marks coveringthewholesyllabus.

xi. Part B also covers the entire syllabus consisting of one question having choices,carrying10marks.Onequestionmustbesetfromunits having descriptive topics.Thedurationofexaminationis2hours.

CO-POMapping

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

High-3,Medium-2,Low- 1

Semester: I		
CONSTITUTION OF INDIA, PROFESSIONAL ETHICS AND CYBER LAW (Theory)		
Course Code: MVJ22ICOK17		**CIE Marks:50**
Credits: L:T:P: 1:0:0		**SEE Marks: 50**
Hours:15L		**SEE Duration: 02 Hours**
Course Learning Objectives: The students will be able to		
1	To know the fundamental political codes, structure, procedures, powers, and duties of Indian constitution, Indian government institutions, fundamental rights, directive principles and the duties of the citizens.	
2	To provide overall legal literacy to the young technograts to manage complex societal issues in the present scenario.	
3	To understand engineering ethics & their responsibilities, identify their individual roles and ethical responsibilities towards society.	

UNIT-I	**L1,L2**
Introduction to Indian Constitution The Necessity of the Constitution, The Societies before and after the Constitution adoption. Introduction to the Indian Constitution, The Making of the Constitution, The role of the Constituent Assembly – Preamble and Salient features of the Constitution of India. Fundamental Rights and its Restriction and Limitations in different Complex Situations. Directive Principles of State Policy (DPSP) and its present relevance in our society with examples. Fundamental Duties and its Scope and Significance in Nation Building.	**3Hrs**
UNIT-II	**L1,L2**
Union Executive and State Executive: Parliamentary System, Federal System, Centre-State Relations. Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism. State Executives – Governor, Chief Minister, State Cabinet, State Legislature, High Court and Subordinate Courts, Special Provisions (Article 370, 371, 371J) for some States.	**3Hrs**
UNIT-III	**L1,L2**
Elections, Amendments and Emergency Provisions: Elections, Electoral Process, and Election Commission of India, Election Laws. Amendments - Methods in Constitutional Amendments (How and Why) and Important Constitutional Amendments. Amendments – 7,9,10,12,42,44,61,73,74,75,86, and 91,94,95,100,101,118 and some important Case Studies. Recent Amendments with explanation. Important Judgements with Explanation and its impact on society (from the list of Supreme Court Judgements). Emergency Provisions, types of Emergencies and it's consequences. **Constitutional Special Provisions:** Special Constitutional Provisions for SC & ST, OBC, Special Provision for Women, Children & Backward Classes.	**3Hrs**
UNIT-IV	**L1,L2**
Professional / Engineering Ethics: Scope & Aims of Engineering & Professional Ethics - Business Ethics, Corporate Ethics, Personal Ethics. Engineering and Professionalism,	**3Hrs**

Positive and Negative Faces of Engineering Ethics, Code of Ethics as defined in the website of Institution of Engineers (India) : Profession, Professionalism, Professional Responsibility. Clash of Ethics, Conflicts of Interest. Responsibilities in Engineering - Responsibilities in Engineering and Engineering Standards, the impediments to Responsibility. Trust and Reliability in Engineering, IPRs (Intellectual Property Rights), Risks, Safety and liability in Engineering.	
UNIT-V	**L1,L2**
Internet Laws, Cyber Crimes and Cyber Laws: Internet and Need for Cyber Laws, Modes of Regulation of Internet, Types of cyber terror capability, Net neutrality, Types of Cyber Crimes, India and cyber law, Cyber Crimes and the information Technology Act 2000, Internet Censorship, Cybercrimes and enforcement agencies.	**3Hrs**

Course Outcomes: After completing the course, the students will be able to	
CO1	Have constitutional knowledge and legal literacy
CO2	Understand Engineering and Professional ethics and responsibilities of Engineers.
CO3	Understand the cyber crimes and cyber laws for cyber safety measure.
Reference Books	
1.	Constitution of India and Professional Ethics, T.S. Anupama, Sunstar Publisher
2.	Durga Das Basu (DD Basu): "Introduction to the Constitution on India", (Students Edition.) Prentice –Hall EEE, 19th/20th Edn., (Latest Edition) or 2008.
3.	Shubham Singles, Charles E. Haries, and Et al : "Constitution of India and Professional Ethics" by Cengage Learning India Private Limited, Latest Edition – 2018.

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE for 50 marks, executed by way of tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 40 marks and assignment is evaluated for 10 marks. The three tests are conducted for 40 marks each and the average of all the tests are calculated for 40. The marks for the assignments are 10 (2 assignments for 5 marks each). The marks obtained in test and assignment are added and report CIE for 50 marks.

Semester End Examination (SEE):

SEE for 50 marks, executed by means of an examination. The Question paper contains objective type questions for 50 marks covering the entire syllabus having same complexity in terms of COs and Bloom's taxonomy level.

Total marks: 50+50=100

CO-PO Mapping												
CO/PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	-	-	-	-	-	2	2	-	-	1	2	-
CO2	-	-	-	-	-	2	2	-	-	1	2	-
CO3	-	-	-	-	-	2	2	-	-	1	2	-

Semester: I		
SCIENTIFIC FOUNDATIONS OF HEALTH (Theory)		
Course Code: MVJ22SFHK18		**CIE Marks:50**
Credits: L:T:P: 1:0:0		**SEE Marks: 50**
Hours:15L		**SEE Duration: 02 Hours**

Course Learning Objectives: The students will be able	
1	To know about Health and wellness (and its Beliefs) & It's balance for positive mindset.
2	To Build the healthy lifestyles for good health for their better future.
3	To Create a Healthy and caring relationships to meet the requirements of good/social/positive life.
4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
5	To Prevent and fight against harmful diseases for good health through positive mindset

UNIT-I	**L1,L2**
Good Health & It's balance for positive mindset: Health -Importance of Health, Influencing factors of Health, Health beliefs, Advantages of good health, Health & Behavior, Health & Society, Health & family, Health & Personality, Psychological disorders-Methods to improve good psychological health, Changing health habits for good health.	**3Hrs**
UNIT-II	**L1,L2**
Building of healthy lifestyles for better future: Developing healthy diet for good health, Food & health, Nutritional guidelines for good health, Obesity & overweight disorders and its management, Eating disorders, Fitness components for health, Wellness and physical function, How to avoid exercise injuries	**3Hrs**
UNIT-III	**L1,L2**
Creation of Healthy and caring relationships: Building communication skills, Friends and friendship - Education, the value of relationship and communication skills, Relationships for Better or worsening of life, understanding of basic instincts of life (more than biology), Changing health behaviours through social engineering.	**3Hrs**
UNIT-IV	**L1,L2**
Avoiding risks and harmful habits : Characteristics of health compromising behaviors, Recognizing and avoiding of addictions, How addiction develops, Types of addictions, influencing factors of addictions, Differences between addictive people and non-addictive people & their behaviors. Effects of addictions Such as..., how to recovery from addictions.	**3Hrs**
UNIT-V	**L1,L2**
Preventing & fighting against diseases for good health: How to protect from different types of infections, How to reduce risks for good health, Reducing risks & coping with chronic conditions, Management of chronic illness for Quality of life, Health & Wellness of youth :a challenge for upcoming future, Measuring of health & wealth status.	**3Hrs**

Course Outcomes: After completing the course, the students will be able to

CO1	Understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset.
CO2	Develop the healthy lifestyles for good health for their better future.
CO3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
CO4	Learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
CO5	Prevent and fight against harmful diseases for good health through positive mindset.

Reference Books

1.	"Scientific Foundations of Health" – Study Material Prepared by Dr. L Thimmesha, Published in VTU - University Website
2.	"Scientific Foundations of Health", (ISBN-978-81-955465-6-5) published by Infinite Learning Solutions, Bangalore – 2022.
3.	Health Psychology - A Textbook, FOURTH EDITION by Jane Ogden McGraw Hill Education (India) Private Limited - Open University Press.
4	Health Psychology (Second edition) by Charles Abraham, Mark Conner, Fiona Jones and Daryl O'Connor – Published by Routledge 711 Third Avenue, New York, NY 10017.
5	HEALTH PSYCHOLOGY (Ninth Edition) by SHELLEY E. TAYLOR - University of California, Los Angeles, McGraw Hill Education (India) Private Limited - Open University Press.

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE for 50 marks, executed by way of tests (T) and assignments. The three tests are conducted by means of an MCQ examination for 50 marks each and the average of all the tests are calculated for 40. The marks for the assignments are 10 (2 assignments for 5 marks each). The marks obtained in test and assignment are added and report CIE for 50 marks.

Semester End Examination (SEE):

SEE for 50 marks, executed by means of an examination. The Question paper contains objective type questions for 50 marks covering the entire syllabus having same complexity in terms of COs and Bloom's taxonomy level.

Total marks: 50+50=100

CO-PO Mapping												
CO/PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	-	-	-	-	-	-	-	-	1	-	-	1
CO2	-	-	-	-	-	-	-	-	1	-	-	1
CO3	-	-	-	-	-	-	-	-	1	-	-	1
CO4	-	-	-	-	-	-	-	-	1	-	-	1
CO5	-	-	-	-	-	-	-	-	1	-	-	1