MVJ College of Engineering, Whitefield, Bangalore,

An Autonomous Institution, Affiliated to VTU, Belagavi

Scheme of Teaching and Examination 2022-23

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2022-23)

II SEMESTER -B.E. ME STREAMS-PHYSICS CYCLE

S. No	Course		Course Title	Teaching Department	Teaching hours/week				Examination				Credits
					Theory Lecture	Tutorial	Practical/Drawing	Skill development activity	Duration in Hours	CIE Marks	SEE Marks	Total marks	
	Type	Code			L	T	P	S					
1	ASC(IC)	MVJ22MATM21	Mathematics for ME Stream-II	MAT	2	2	2	0	3	50	50	100	4
2	ASC(IC)	MVJ22PHYM22	Applied Physics for ME Stream	PHY	2	2	2	0	3	50	50	100	4
3	ESC	MVJ22EME23	Elements of Mechanical Engineering	ME	2	2	0	0	3	50	50	100	3
4	ESC-II	MVJ22ESCK24C/MVJ22ESCK24A	Introduction to Electronics Engineering/ Introduction to Civil Engineering	EC/CV	3	0	0	0	3	50	50	100	3
5	PLC-II	MVJ22PLCK25B	Introduction to Python Programming	CS	2	0	2	0	2	50	50	100	3
6	AEC	MVJ22PWSK26	Professional Writing skills in english	ENG	0	2	0	0	1	50	50	100	1
7	HSMC	MVJ22KSKK27/ MVJ22KBKK27	Samskrutika Kannada/ Balake Kannada	KAN	1	0	0	0	1	50	50	100	1
8	AEC/SDC	MVJ22IDTK28	Innovation and Design thinking	Any Engineering Department	1	0	0	0	1	50	50	100	1
				Total	13	8	6	0	17	400	400	800	**20**

ASC: Applied Science Course, IC-Integrated Course (Theory Course Integrated with Practical Course), ESC-Engineering Science Courses, ETC: Emerging Technology Course, AEC: Ability Enhancement Course, HSMC: Humanityand Social Scienceand Management Course, SDC: Skill Development Course.

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 Physics for ME Stream	Semester	I/II
Course Code	MVJ22PHYM22	**CIE**	50
Total No. of Contact Hours	40 L : T : P : S :: 20 :20 : 00:00	**SEE**	50
No. of Contact Hours/week	4	**Total**	100
Credits	3	**Exam. Duration**	3 HOURS

Course objectives

- Elucidate the concepts in oscillations, waves, elasticity and material failures
- Discuss the fundamentals of Thermoelectric materials and their application
- Summarize the low temperature phenomena and generation of low temperature.
- Explain the various material characterization techniques
- Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Teaching Learning Process :

1. Blended Mode of Learning
2. Flipped Class
3. Simulations,Interactive Simulations and Animations
4. NPTEL and Other Videos for theory topics
5. Smart Class Room
6. LabExperimentVideos

Module-1	RBT Level	Hrs.
Module-I:OscillationsandShockwaves: **Oscillations**: SimpleHarmonic motion(SHM), Differential equationfor SHM(No derivation), Sprigs: Stiffness Factor and its Physical Significance, Series and Parallel combination of springs (Derivation), Types of Springs and their applications. Theory of Damped oscillations (Qualitative), Types of Damping (Graphical Approach). Engineering applications of Damped oscillations, Theory of Forced oscillations (Qualitative), Resonance, Sharpness of resonance. Numerical Problems. **Shock waves**: Mach number and Mach Angle, Mach Regimes, Definition and Characteristics of Shock waves, Construction and working of Reddy Shock tube, Applications of Shock Waves, Numerical problems. **Self-Learning topics:** Simple Harmonic motion,Differential equation for SHM **Video link / Additional online information:**	L1, L2, L3	8

https://www.youtube.com/watch?time_continue=29&v=olTD-mpsU4E&feature=emb_logo https://www.youtube.com/watch?time_continue=420&v=T3XguAI-I5c&feature=emb_logo https://www.youtube.com/watch?v=bO2Z308uFpo		
Module-2	**RBT Level**	**Hrs.**
Elasticity Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson's ratio, Relation between Y, n and σ (with derivation), mention relation between K, Y and σ, limiting values of Poisson's ratio. Beams, Bending moment and derivation of expression, Cantilever and I section girder and their Engineering Applications, Elastic materials (qualitative). Failures of engineering materials - Ductile fracture, Brittle fracture, Stress concentration, Fatigue and factors affecting fatigue (only qualitative explanation), Numerical problems. **Self-Learning topics:** Young's Modulus of materials by Uniform Bending Method **Video link / Additional online information:** https://youtu.be/ITuWnrl3aKI https://youtu.be/JGK8i0X55Mc https://www.youtube.com/watch?v=R6yC-rkrYz4	L1, L2, L3	9
Module-3	**RBT Level**	**Hrs.**
Thermoelectric materials and devices: Thermo emf and thermo current, Seeback effect, Peltier effect, Seeback and Peltier coefficients, figure of merit (Mention Expression), laws of thermoelectricity. Expression for thermo emf in terms of T_1 and T_2, Thermo couples, thermopile, Construction and Working of Thermoelectric generators (TEG) and Thermoelectric coolers (TEC), low, mid and high temperature thermoelectric materials, Applications: Exhaust of Automobiles, Refrigerator, SpaceProgram (RTG), Numerical Problems **Self-Learning topics:** Quantum logic gates	L1, L2, L3	8

Video link / Additional online information: https://www.youtube.com/watch?v=x47nky4MbK8 https://www.youtube.com/watch?v=2w7NBuu5w9c&list=PLtkeUZItwHK5y6qy1GFxa4Z4RcmzUaaz6 https://www.youtube.com/watch?v=NruYdb31xk8		
Module-4	**RBT Level**	**Hrs.**
Cryogenics: Production of low temperature - Joule Thomson effect (Derivation with 3 cases), Porous plug experiment with theory, Thermodynamical analysis of Joule-Thomsoneffect, Liquefaction of Oxygen by cascade process,Lindey's air liquefier, Liquefaction of Helium and its properties, Platinum Resistance Thermometer, Applications of Cryogenics, in Aerospace, Tribology and Food processing(qualitative), Numerical Problems **Self-Learning topics:** Application of Cryogenics in Food Processing. **Video link / Additional online information:** https://cevgroup.org/cryogenics-basics-applications/ https://www.youtube.com/watch?v=aMelwOsGpIs https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham	L1, L2, L3	8
Module-5	**RBT Level**	**Hrs.**
Material Characterization and Instrumentation Techniques: Introduction to nano materials: Nanomaterial and nano composites. Principle, construction and working of X-ray Diffractometer, Crystallite size determination by Scherrer equation, Atomic Force Microscopy (AFM): Principle, construction, working and applications, X-ray photoelectron spectroscopy(XPS), Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Numerical Problems. **Video link / Additional online information:** https://onlinecourses.nptel.ac.in/noc20_mm14/	L1, L2, L3	7

previewhttps://www.encyclopedia.com/science-and-technology/physics/physics/cryogenics https://www.usna.edu/NAOE/_files/documents/Courses/EN380/Course_Notes/Ch10_Deformation.pdf		

Course outcomes:	
CO1	Elucidate the concepts in oscillations,waves,elasticity and material failures
CO2	Discuss the fundamentals ofThermoelectric materials and their application
CO3	Summarize the low temperature phenomena and generation of lowtemperature
CO4	Explain the various material characterization techniques
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

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.

ContinuousInternalEvaluation(CIE):
The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20Marks**.

- Three Tests each of 20 Marks**;** after the completion of the syllabus of 35-40%, 65-70%,and 90-100% respectively.
- Two Assignments/ two quizzes/ seminars/ one field survey and report presentation/ one-course project totalling 20 marks.Total Marks scored(test+assignments) out of 80 shall be scaled down to **30marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded onthe same day. The 15 marks are for conducting the experiment and preparationofthe laboratoryrec- ord, the other 05 marks shall be for the test conducted at the end of the semester.
- The CIE marks awarded inthe case ofthe Practical component shall be based onthe continuous evaluationofthe laboratoryreport. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 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 05 marks.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be12(40%of maximum

marks)in the theory component and 08(40%of maximum marks) in the practical component.The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions fromthe laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all ques- tions should not be more than 25 marks. The theory component of the IC shall be for both CIE and SEE.

SemesterEndExamination(SEE):
Theory SEE will be conducted byUniversityas per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**

- Thequestionpapershallbesetfor100marks.The mediumofthequestionpapershallbeEnglish/Kannada).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 studentshavetoanswer5fullquestions,selectingonefullquestionfromeachmodule.Thestudenthasto 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.	Vibrations and Waves(MIT introductory Physics Series),APFrench,CBS,2003Edition
2.	Timoshenko,S.and GoodierJ.N. "Theory of Elasticity",2nd Edition,McGrawHillBookCo,2001.
3.	Sadhu Singh,"Theory of Elasticity",Khanna Publishers,1997
4.	Mechanical Properties of Engineered Materials by Wole Soboyejo,CRCPress;1stedition,2002
5	Heat&Thermo dynamics and Statistical Physics(XVIII-Edition)–Singhal,Agarwal & Satyaprakash–Pragati Prakashan, Meerut, 2006. 4
6	Heat and Thermodynamics(I-Edition)–D.S.Mathur-S.Chand & CompanyLtd.,New-Delhi,1991
7	Heat and Thermodynamics,Brijlal & Subramanyam,S.Chand&CompanyLtd.,New-Delhi.
8	Physics of Cryogenics by Bahman Zohuri,Elsevier,2018
9	Materials Characterization Techniques - Sam Zhang, LinLi, Ashok Kumar, CRC Press, First Edition, 2008
10	Characterization of Materials-MitraP.K.Prentice Hall India Learning Private Limited.
11	Nanoscience and Nanotechnology : Fundamentals to Frontiers –M.S.Ramachandra Rao & Shubra Singh,Wiley India Pvt Ltd.
12	Nano Composite Materials-Synthesis, Properties and Applications,J.Parameswaran pillai,N.Hameed,T.Kurian,Y.Yu,CRCPress.
13	Shock waves made simple by Chintoo S Kumar,K Takayama and KPJ Reddy : Willey India Pvt.Ltd, Delhi,2014

Course Title	Applied Physics for ME Stream-Lab	Semester	I/II
Course Code	MVJ22PHYM11/21 -Lab	**CIE**	50
Total No. of Contact Hours	24 L : T : P : S :: 00 :00 : 24:00	**SEE**	50
No. of Contact Hours/week	2	**Total**	100
Credits	1	**Exam. Duration**	3 HOURS

Course objective is to:

1. To realise experimentally, the mechanical, electrical and thermal properties of materials, concept of waves and oscillations
2. Design simple circuits and hence study the characteristic of semiconductor devices

Laboratory Experiments
1. Determination of Young's modulus of the material of the given bar Uniform Bending.
2. Determination of Rigidity modulus of the Material of the wire using Torsional Pendulum.
3. Study of Forced Mechanical Oscillations and Resonance.
4. Study of the frequency response of Series & Parallel LCR circuits.
5. Determination of Fermi Energy of the given Conductor.
6. Determination of Resistivity by Four Probe Method.
7. Determination of effective spring constant of the given springs in series and parallel combinations.
8.Determination of Young's modulus of the material of the given bar Single Cantilever.
9. Determination of the Moment of Inertia of the given irregular body using torsional pendulum.
10. Determination of Wavelength of Laser using Diffraction Grating.
11. Determination of Acceptance angle and Numerical Aperture of the given Optical Fiber.
12. Determination of the Radius of Curvature of the given Plano Convex Lens by setting Newton's Rings
13. Step Interactive Physical Simulations.
14. Study of motion using spread Sheets
15. Application of Statistics using Spread Sheets.
16. PHET Interactive Simulations

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.

The student has to obtain minimum of 50% marks individually both in CIE and SEE to pass.

Continuous Internal Evaluation:

1. Weekly evaluation of conduction, record submission will have a weightage of 40 marks for the semester.
2. Two lab internal tests of 50 marks each will be conducted. Average of which will be reduced by a factor of 5 amounting to 10 marks.

Hence, total lab internal will be for 50 marks.

Semester End Examination:

Lab SEE will be conducted by the institution involving the Board of examiners as per scheduled time table.

1. The question paper will contain 2 lab experiments of 50marks each without any choice.
2. The total of whichwill be reduced by a factor of 2 amounting to 50 marks.

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

High-3, Medium-2, Low-1

Course Title:	ELEMENTS OF MECHANICAL ENGINEERING		
Course Code:	MVJ22EME13/23	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

Course Learning Objectives

CLO 1. Acquire a basic understanding about scope of mechanical engineering, fundamentals about steam and non-conventional energy sources.

CLO 2. Acquire a basic knowledge about conventional and advanced manufacturing processes.

CLO 3. Acquiring a basic understanding about IC engines, propulsive devices and air-conditioner.

CLO 4. Acquiring a basic knowledge about power transmission and joining processes.

CLO 5. Acquiring a basic insight into future mobility and mechatronics and robotics.

Teaching-Learning Process

- Adopt different types of teaching methods to develop the outcomes throughPowerPoint presentations and Video demonstrations or Simulations.
- Arrange visits to show the live working models other than laboratory topics.
- Adopt collaborative (Group Learning) Learning in the class.
- Adopt Problem Based Learning (PBL), which foster students' Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information.

Module-1 (8 hours)

Introduction to Mechanical Engineering (Overview only):
Role of Mechanical Engineering in Industries and Society- Emerging Trends and Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.

Steam Formation and Application:
Modes of heat transfer, Steam formation, Types of steam, Steam properties and applications of steam (simple numerical problems).

Energy Sources and Power Plants:
Basic working principles of Hydel power plant, Thermal power plant, nuclear power plant, Solar power plant, Tidal power plant and Wind power plant.

Module-2 (8 hours)

Machine Tool Operations:
Lathe: Principle of working of a center lathe, lathe operations: Turning, facing, knurling, thread cutting, taper turning by swivelling the compound rest,
Drilling Machine: Working of simple drilling machine, drilling operations: drilling, boring, reaming, tapping, counter sinking, counter boring,
Milling Machine: Working and types of milling machine, milling operations: plane milling, end milling and slot milling.
(No sketches of machine tools, sketches to be used only for explaining the operations).
Introduction to Advanced Manufacturing Systems: Introduction, components of CNC, advantages and applications of CNC, 3D printing.

Module-3 (8 hours)

Introduction to IC Engines: Components and working principles, 4-Stroke Petrol and Diesel engines, Application of IC Engines, performance of IC engines (Simple numerical).

Introduction to Refrigeration and Air Conditioning: Principle of refrigeration, Refrigerants and their desirable properties. Working principle of VCR refrigeration system, working principle of room air conditioner & Applications of air Conditioners

Module-4 (8 hours)

Mechanical Power Transmission:

Gear Drives: Types - spur, helical, bevel, worm and rack and pinion, velocity ratio, simple and compound gear trains (simple numerical problems)

Belt Drives: Introduction, Types of belt drives (Flat and V-Belt Drive), length of the belt and tensions ratio (simple numerical problems)

Joining Processes: Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding, (types of flames), TIG welding, MIG welding and Fusion welding.

Module-5 (8 hours)

Insight into future mobility technology; Electric and Hybrid Vehicles, Components of Electric and Hybrid Vehicles. Advantages and disadvantages of Electric Vehicles (EVs) and Hybrid vehicles.

Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems. Joints & links, Robot anatomy, Applications of Robots in material handling, processing and assembly and inspection.

Course outcome (Indicative)

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

CO1	Explain the role of mechanical engineering in industry and society, fundamentals of steam and non-conventional energy sources
CO2	Describe different conventional and advanced machining processes, IC engines, propulsive devices, air-conditioning, refrigeration.
CO3	Explain different gear drives, gear trains, aspects of future mobility and fundamentals of robotics
CO4	Determine the condition of steam and its energy, performance parameters of IC engines, velocity ratio and power transmitted through power transmission systems.

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.
- 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.
- The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

Suggested Learning Resources:

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

1. Elements of Mechanical Engineering, K R Gopala Krishna, Subhash Publications, 2008
2. Elements of Workshop Technology (Vol. 1 and 2), Hazra Choudhry and Nirzar Roy, MediaPromoters and Publishers Pvt. Ltd., 2010.

Reference Books

1. An Introduction to Mechanical Engineering, Jonathan Wickert and Kemper Lewis, Third Edition,

2012

2.Manufacturing Technology- Foundry, Forming and Welding, P.N.Rao Tata McGraw Hill 3rdEd., 2003.

3.Robotics, Appu Kuttan KK K. International Pvt Ltd, volume 1

Web links and Video Lectures (e-Resources):

- . https://www.tlv.com/global/TI/steam-theory/principal-applications-for-steam.html
- https://www.forbesmarshall.com/Knowledge/SteamPedia/About-Steam/Fundamental-Applications-of-Steam
- https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing- and-process-industry/)
- Videos | Makino (For Machine Tool Operation)

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

1. Visit to any manufacturing/aero/auto industry or any power plant
2. Demonstration of lathe/milling/drilling/CNC operations
3. Demonstration of working of IC engine/refrigerator
4. Demonstration of metal joining process
5. Video demonstration of latest trends in mobility/robotics

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**				**1**	**1**			**1**		**1**
CO2	**3**	**2**				**1**	**1**			**1**		**1**
CO3	**3**	**2**				**1**	**1**			**1**		**1**
CO4	**3**	**3**				**1**	**1**					**1**
CO5												

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

Course Title:	**Introduction to Electronics & Communication**		
Course Code:	**MVJ22ESCK24C**	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

1. To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.
2. To equip students with a basic foundation in electronic engineering required for comprehendingthe operation and application of electronic circuits, logic design, embedded systems, and communication systems.
3. Professionalism & Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.

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. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Arrange visits to nearby PSUs such as BHEL, BEL, ISRO, etc., and small-scale hardware Industries to give brief information about the electronics manufacturing industry.
3. Show Video/animation films to explain the functioning of various analog and digital circuits.
4. Encourage collaborative (Group) Learning in the class
5. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking
6. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
7. Topics will be introduced in multiple representations.
8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Module-1 (8 hours)

Power Supplies –Block diagram, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers.

Amplifiers – Types of amplifiers, Gain, Input and output resistance, Frequency response, Bandwidth, Phase shift, Negative feedback, multi-stage amplifiers (Text 1)

Module-2(8 hours)

Oscillators – Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, Multivibrators, Single-stage a stable oscillator, Crystal controlled oscillators (Only Concepts, working, and waveforms. No mathematical derivations) **Operational amplifiers -**Operational amplifier parameters, Operational amplifier characteristics, Operational amplifier configurations, Operational amplifier circuits. Text 1)
Module-3 (8 hours)
Boolean Algebra and Logic Circuits: Binary numbers, Number Base Conversion, octal & Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 2: 1.2, 1.3, 1.4, 1.5,2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7) **Combinational logic**: Introduction, Design procedure, Adders- Half adder, Full adder (Text 2:4.1, 4.2, 4.3)
Module-4 (8 hours)
Embedded Systems – Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC **Sensors and Interfacing** – Instrumentation and control systems, Transducers, Sensors, Actuators, LED, 7-Segment LED Display. (Text 3)
Module-5 (8 hours)
Analog Communication Schemes – Modern communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Multiplexing, Types of communication systems. Types of modulation (only concepts) – AM, FM, Concept of Radio wave propagation (Ground, space, sky) **Digital Modulation Schemes**: Advantages of digital communication over analog communication, ASK, FSK, PSK, Radio signal transmission Multiple access techniques. (Text 4)

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.Mike Tooley, 'Electronic Circuits, Fundamentals & Applications',4thEdition, Elsevier, 2015. DOI https://doi.org/10.4324/9781315737980. eBook ISBN9781315737980
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-84.
3. K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017.

CO-PO Mapping

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

Semester: II	
INTRODUCTION TO CIVIL ENGINEERING (Theory)	
Course Code: MVJ22ESCK24A	**CIE Marks: 50**
Credits: L:T:P: 2:1:0	**SEE Marks: 50**
Hours: 40 L	**SEE Duration: 03 Hrs.**
Course Learning Objectives: The students will be able to	
1	To make students learn the scope of various specializations of civil engineering
2	To make students learn the concepts of sustainable infrastructure
3	To develop students' ability to analyse the problems involving forces, moments with their applications.
4	To develop the student's ability to find out the center of gravity and moment of inertia and their applications.
5	To develop the student's ability to find out the moment of inertia and their applications.

MODULE-I	**L1, L2**
Civil Engineering Disciplines and Building Science **Introduction to Civil Engineering:** Surveying, Structural Engineering, Geotechnical Engineering, Hydraulics & Water Resources, Transportation Engineering, Environmental Engineering, Construction planning &Project management. **Basic Materials of Construction**: Bricks, Cement & mortars, Plain, Reinforced &Pre-stressed Concrete, Structural steel, Construction Chemicals. **Structural elements of a building:** foundation, plinth, lintel, chejja, Masonry wall, column, beam, slab and staircase	**3 Hrs**
MODULE-II	**L1, L2**
Societal and Global Impact of Infrastructure **Infrastructure:** Introduction to sustainable development goals, Smart city concept, clean city concept, Safe city concept **Environment:** Water Supply and Sanitary systems, urban air pollution	**3 Hrs**

management, Solid waste management, identification of Landfill sites, urban flood control **Built-environment:** Energy efficient buildings, recycling, Temperature and Sound control in buildings, Security systems; Smart buildings.	
MODULE-III	**L1, L2**
Analysis of force systems: Concept of idealization, system of forces, principles of superposition and transmissibility, Resolution and composition of forces, Law of Parallelogram of forces, Resultant of concurrent and non-concurrent coplanar force systems, moment of forces, couple, Varignon's theorem, free body diagram, equations of equilibrium, equilibrium of concurrent and non-concurrent coplanar force systems	**3 Hrs**
MODULE-IV	**L1, L2**
Centroid: Importance of centroid and centre of gravity, methods of determining the centroid, locating the centroid of plane laminae from first principles, centroid of built-up sections. Numerical examples	**3 Hrs**
MODULE-V	**L1, L2**
Moment of inertia: Importance of Moment of Inertia, method of determining the second moment of area (moment of inertia) of plane sections from first principles, parallel axis theorem and perpendicular axis theorem, section modulus, radius of gyration, moment of inertia of built-up sections, Numerical Examples.	**3 Hrs**

Course Outcomes: After completing the course, the students will be able to	
CO1	Understand the various disciplines of civil engineering
CO2	Understand the infrastructure requirement for sustainable development
CO3	Compute the resultant and equilibrium of force systems.
CO4	Locate the centroid of plane and built-up sections
CO5	Compute the moment of inertia of plane and built-up sections.

Reference Books

1.	Beer F.P. and Johnston E. R., Mechanics for Engineers, Statics and Dynamics, 1987, McGraw Hill.
2.	Irving H. Shames, Engineering Mechanics, 2019, Prentice-Hall.
3.	Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, 2017, Pearson Press.

Text Books	
1.	Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, 2015, Laxmi Publications.
2.	Kolhapure B K, Elements of Civil Engineering and Engineering Mechanics, 2014, EBPB

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part - A and Part - B. Part - A consists of objective type questions for 20 marks covering the entire syllabus. Part - B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks.

Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom's taxonomy level.

CO-PO Mapping												
CO/PO	P01	P02	P03	PO4	P05	P06	P07	P08	P09	P010	P011	P012
CO1	1	1	1	-	-	-	1	-	-	1		1
CO2	3	3	1	2	-	-	1	-	-	1		2
CO3	3	3	1	2	-	-	-	-	-	1		2
C04	3	3	1	2	-	-	1	-	-	1		2
CO5	3	3	1	2	-	-	1	-	-	1		2

Semester: II		
Introduction to Python Programming		
Course Code: MVJ22PLCK25B		**CIE Marks:50+50**
Credits: L:T:S: 3:0:1		**SEE Marks: 50 +50**
Hours:40 L+ 26 P		**SEE Duration: 03+03 Hours**

Course Learning Objectives: The students will be able to	
1	Learn the syntax and semantics of the Python programming language
2	Illustrate the process of structuring the data using lists, tuples
3	Appraise the need for working with various documents like Excel, PDF, Word and Others
4	Demonstrate the use of built-in functions to navigate the file system.
5	Implement the Object Oriented Programming concepts in Python.

UNIT-I	
Python Basics: Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program, Flow control: Boolean Values, Comparison Operators, Boolean Operators,Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules,Ending a Program Early with sys.exit(), Functions: def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number **Textbook 1: Chapters 1 – 3**	**8Hrs**
UNIT-II	
Lists: The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples, References, Dictionaries and Structuring Data: The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things, **Textbook 1: Chapters 4 – 5**	**8 Hrs**
UNIT-III	
Manipulating Strings: Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup Reading and Writing Files: Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module,Saving Variables with the print.format() Function, Project: Generating Random Quiz Files, Project: Multiclipboard, **Textbook 1: Chapters 6 ,8**	**8 Hrs**
UNIT-IV	
Organizing Files: The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates,Project: Backing Up a Folder into a ZIP File, Debugging: Raising Exceptions, Getting the Traceback as a String, Assertions, Logging,	**8 Hrs**

IDLE‟s Debugger. **Textbook 1: Chapters 9-10**	
UNIT-V	
Classes and objects: Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying, Classes and functions: Time, Pure functions, Modifiers, Prototyping versus planning, Classes and methods: Object-oriented features, Printing objects, Another example, A more complicated example,Theinit method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation, **Textbook 2: Chapters 15 – 17**	**8 Hrs**

LABORATORY EXPERIMENTS

Programming Exercises:

1. a. Develop a program to read the student details like Name, USN, and Marks in three subjects. Display the student details, total marks and percentage with suitable messages.

b. Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.

2. a. Develop a program to generate Fibonacci sequence of length (N). Read N from the console.

b. Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).

3. Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.

4. Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.

5. Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary with distinct words and their frequency of occurrences. Sort the dictionary in the reverse order of frequency and display dictionary slice of first 10 items]

6. Develop a program to sort the contents of a text file and write the sorted contents into a separate text file. [Hint: Use string methods strip(), len(), list methods sort(), append(), and file methods open(), readlines(), and write()].

7. Develop a program to backing Up a given Folder (Folder in a current working directory) into a ZIP File by using relevant modules and suitable methods.

8. Write a function named DivExp which takes TWO parameters a, b and returns a value c (c=a/b). Write suitable assertion for a>0 in function DivExp and raise an exception for when b=0. Develop a suitable program which reads two values from the console and calls a function DivExp.

9. Define a function which takes TWO objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N (N >=2) complex numbers and to compute the addition of N complex numbers.

10. Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use __init__() method to initialize name, USN and the lists to store marks and total, Use getMarks() method to read marks into the list, and display() method to display the score card details.]

Course Outcomes: After completing the course, the students will be able to	
CO1	Demonstrate proficiency in handling loops and creation of functions.
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries
CO3	Develop programs for string processing and file organization
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Demonstrate the inheritance and polymorphism concepts of object oriented programming.

Reference Books	
1.	Al Sweigart,"Automate the Boring Stuff with Python",1 stEdition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at https://automatetheboringstuff.com/) (Chapters 1 to 18, except 12) for lambda functions use this link: https://www.learnbyexample.org/python-lambda-function/
2.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2 nd Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at http://greenteapress.com/thinkpython2/thinkpython2.pdf (Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above link)

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks

for the self -study are 20 (2 presentations are be held for 10 marks each). The marks obtained in test, quiz and self -studies are added to get marks out of 100 and report CIE for 50 marks.

Laboratory- 50 Marks

The laboratory session is held every week as per the time table and the performance of the student is evaluated in every session. The average of the marks over number of weeks is considered for 30 marks. At the end of the semester a test is conducted for 10 marks. The students are encouraged to implement additional innovative experiments in the lab and are awarded 10 marks. Total marks for the laboratory is 50.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks are executed by means of an examination.

The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the complete syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom's taxonomy level.

Laboratory- 50 Marks

Experiment Conduction with proper results is evaluated for 40 marks and Viva is for 10 marks. Total SEE for laboratory is 50 marks.

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

CourseTitle	Professional Writing Skills in English	**Semester**	02
CourseCode	MVJ22PWSK26	**CIE**	50
TotalNo.ofContactHours	02	**SEE**	50
No.ofContactHours/week	35hours	**Total**	100
Credits	01	**Exam.Duration**	3Hours

Courseobjectiveisto:

- To use Englishvocabularyaptlyandflawlessly andensurelanguage proficiency.
- ToachievebettertechnicalwritingandPresentationskills
- ToIdentifythecommonerrorsinSpokenandWrittenEnglish
- ToacquireEmploymentandWorkplacecommunicationskills

LanguageLab:

ToaugmentLSRWandGVskills(Listening,Speaking,Reading,Writing,GrammarandVocabulary)throughtests,activities,exercisesetc.viacomprehensiveweb-basedlearningandassessmentsystems

Module-1	**RBTLevel**	**Hours**

SyllabusContent:

IntroductiontoTechnicalCommunication

1.1 SubjectVerbAgreement(ConcordRuleswithExercises)

1.2 CommonerrorsinSubject-verbagreement,Noun-pronounagreement

1.3 Common errors in the use of Adjectives, Adverbsand Conjunctions; misplacedmodifiers

1.4 WordOrder,errorsduetotheconfusionofwords

1.5 Anagrams,palindromes,puns

1.6 Idiomsandphrases–commonerrors

1.7.Honingreadingskills

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

Module-2	**RBTLevel**	**Hours 7hrs**

SyllabusContent:

TheNuancesofWriting

1.1 OrganizingPrinciplesofParagraphsinDocuments

1.2 Developinghintsintoorganizedparagraphs

1.3 Dialoguewriting.

1.4 Contextualvocabulary

1.5 ImportanceofproperPunctuation

1.6 One-wordsubstitutes

1.7 Polishingwritingskills–similesandmetaphors

1.8 TheArtofCondensation(Precisewriting)

1.9 Wordcollocations

1.10 Redundancyandjargoninwriting

1.11 Techniquesincreativewriting

1.12 CommonErrorsduetoIndianisminEnglishCommunication

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

Module-3	**RBTLevel**	**Hours 7hrs**

SyllabusContent:

HoningWritingSkills

1.1 EffectiveTechnicalReadingandWritingPractices

1.2 Tipsforgoodandeffectivewriting

1.3 Parallelisminsentencestructures

1.4 Describingprocesses

1.5 Interpretationofnon-verbaldata–pie-charts,flowchartsetc.

1.6 UseofPassiveVoicesinReportwriting

1.7 Reportwriting.

1.8 SentenceImprovementExercises,ClozeTestandThemeDetectionExercises.

VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)

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

SyllabusContent:

WritingEmails andLetters

1.1 ComponentsofaFormalLetter

1.2 FormatsandTypesofBusinessLetters

1.3 EmailWriting–DosandDon’ts

Practiceinwritingvarioustypesofemails. VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)		
Module-5	**RBTLevel**	**Hours 7hrs**
SyllabusContent: **Non-VerbalCommunication** 1.1 Significanceofnon-verbalcommunication 1.2 BodyLanguage 1.3 GroupDiscussion 1.4. Describingpeople 1.5. Describingeventsandscenes 1.4Presentationskills andFormalPresentationsbyStudents VideoLinks/Anyotherspecialinformation (Papers):(Foradditionalstudyontheconceptsofcontents)		

Courseoutcomes:	
CO1	Identifycommonerrors inSpoken andWrittencommunication
CO2	Reach higherlevelsofperfectioninEnglishvocabularyandlanguage
CO3	Improvenatureandstyleofsensiblewritingandacquire employmentandworkplacecommunication. skills
CO4	ImprovetheirTechnicalCommunicationSkillsthrough TechnicalReadingand Writingpractices
CO5	Perform wellatcampusrecruitment,engineeringandothercompetitive examinations

Textbooks:	
1	**EnglishCommunicationMadeEasy**byChitraLaxman–SathyasriPrintersPvt.Ltd.
ReferenceBooks:	
1	**TechnicalCommunication**byGajendra SinghChauhanandEtal, CengagelearningIndiaPvtLimited [LatestRevisedEdition}-2018.
2	**CommunicationSkills**by SanjayKumarandPushpa Lata, Oxford UniversityPress-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:

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

ii. Part B also covers the entire syllabus consisting of one question having choices,carrying10marks.Onequestionmustbesetfromunits having descriptive topics.Thedurationofthe examinationis2hours.

CO-POMapping

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

High-3,Medium-2,Low-1

Course Title	**Samskruthika kannada (ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ)**	Semester	I/II
Course Code	MVJ21KSK17/27	**CIE**	50
Total No. of Contact Hours	15 L : T : P : S :: 1 :0 : 0:0	**SEE**	50
No. of Contact Hours/week	1	**Total**	100
Credits	1	**Exam. Duration**	2HOURS

Course objective is to: Enable students

- 1. ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು
- ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.
- 3. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
- 4. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳು ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು
- 5ಸಾಂಸ್ಕೃತಿಕ ಜನಪದ ಮತ್ತು ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡುವುದು

Module-1	**RBT Level**	**Hrs.**
ಭಾಗ-ಒಂದು -ಲೇಖನಗಳು **1. ಕನ್ನಡ ನಾಡು,ನುಡಿ ಮತ್ತು ಸಂಸ್ಕೃತಿಗೆ ಸಂಬಂಧಿಸಿದ ಲೇಖನಗಳು** ***ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ:ಹಂಪ ನಾಗರಾಜಯ್ಯ** *** ಕರ್ನಾಟಕ ಏಕೀಕರಣ:ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ** ***ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ** **Self-Learning topics:** . **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3
Module-2	**RBT Level**	**Hrs.**
ಭಾಗ-2 ಕಾವ್ಯ ಭಾಗ (ಆಧುನಿಕ ಪೂರ್ವ) ***ವಚನಗಳು: ಬಸವಣ್ಣ, ಅಕ್ಕ, ಅಲ್ಲಮ**	L1, L2, L3	3

*ಕೀರ್ತನೆಗಳು: ಪುರಂದರ ದಾಸರು ,ಕನಕ ದಾಸರು * ತತ್ವಪದಗಳು: ಷರೀಫ,ಶಿವಯೋಗಿ **Self-Learning topics:** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**		
Module-3	**RBT Level**	**Hrs.**
ಭಾಗ-3 ಆಧುನಿಕ ಕಾವ್ಯ ಭಾಗ *ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ: ಡಿ.ವಿ.ಜಿ [ಕುರುಡು ಕಾಂಚಾಣ : ದ.ರಾ ಬೇಂದ್ರ * ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು **Self-Learning topics:** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3
Module-4	**RBT Level**	**Hrs.**
[:ಭಾಗ-4 *ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿ ಪರಿಚಯ,ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ * ಡಾ.ಸರ್ ಎಂ ವಿಶ್ವೇಶ್ವರಯ್ಯ-ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ * ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ * ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ: ಹಿ.ಚಿ ಬೋರಲಿಂಗಯ್ಯ **Self-Learning topics:** . **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3

Module-5	RBT Level	Hrs.
ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ *** ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ** ***ಕ ಮತ್ತು ಬ ಬರಹ ತಂತ್ರಾಂಶ ಮತ್ತು ಕನ್ನಡ ಟೈಪಿಂಗ್** *** ತಾಂತ್ರಿಕ ಪದಕೋಶ** **Self-Learning topics:** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3

Course outcomes:	
CO1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡಿರುತ್ತದೆ.
CO2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಫೂರ್ತಿ ಮೂಡುತ್ತದೆ.
CO3	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಹೆಚ್ಚಿಸುತ್ತದೆ
CO4	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳು ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕತೆ ಹೆಚ್ಚಾಗುತ್ತದೆ.
CO5	ಸಾಂಸ್ಕೃತಿಕ ,ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮೂಡುತ್ತದೆ.

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

26.10.2022

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:

Two Unit Tests each of 30 Marks (duration 01 hour)

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration.

Two assignments each of 20 Marks

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (To have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks

Semester End Examinations (SEE)

SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is 01 hour. The student must secure a minimum of 35% of the maximum marks for SEE.

Text Books:

1.	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಡಾ. ಹಿ ಚಿ ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ.ಎಲ್ ತಿಮ್ಮೇಶ ಪ್ರಕಟಣೆ :ಪ್ರಸಾರಾಂಗ ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ. ಬೆಳಗಾವಿ

Reference Books:

1.	ಎಮ್ ಎಚ್ ಕೃಷ್ಣಯ್ಯ ಸಂಕ್ಷಿಪ್ತ ಕನ್ನಡ ಭಾಷೆ ಚರಿತ್ರೆ, 1993 ಸುವಿಧ್ಯಾ ಪ್ರಕಾಶನ .ಬೆಂಗಳೂರು.
2.	ಎಂ ಚಿದಾನಂದಮೂರ್ತಿ ಭಾಷಾ ವಿಜ್ಞಾನದ ಮೂಲ ತತ್ವಗಳು ಡಿ.ವಿ.ಕೆ ಮೂರ್ತಿ ಮೈಸೂರು
3	ಶಂಕರ ಭಟ್ ಕನ್ನಡ ವಾಕ್ಯಗಳ ಒಳ ರಚನೆ 2016 ಭಾಷಾ ಪ್ರಕಾಶನ ಮೈಸೂರು
4	ಕರಿಗೌಡ ಬೀಚನಹಳ್ಳಿ ಸಂಪಾದಕ ಭಾಷಾಂತರದ ಸಾಂಸ್ಕೃತಿಕ ನೆಲೆಗಳು ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ ಹಂಪಿ 1999.

Course Title	**Balake Kannada**	Semester	I/II
Course Code	MVJ22KBK17/27	**CIE**	50
Total No. of Contact Hours	15 L : T : P : S :: 1 :0 : 0:0	**SEE**	50
No. of Contact Hours/week	1	**Total**	100
Credits	1	**Exam. Duration**	2HOURS

Course objective is to: Enable students

- The course (22KBK17/27) will enable the students,
- 1. To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
- 2. To enable learners to Listen and understand the Kannada language properly.
- 3. To speak, read and write Kannada language as per requirement.
- 4. To train the learners for correct and polite conservation.
- 5. To know about Karnataka state and its language, literature and General information about this state

Module-1	**RBT Level**	**Hrs.**
1. Introduction, Necessity of learning a local language. Methods to learn the Kannada language.(ವೈಯಕ್ತಿಕಸಾಮ್ಯಸೂಚಕಸಂಬಂಧಿತಸರ್ವನಾಮಗಳುಮತ್ತುಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು) 2.ನಾಮಪದಗಳಸಂಬಂಧಾರ್ಥಕರೂಪಗಳುಸಂದೇಹಸ್ಪದಪ್ರಶ್ನೆಗಳುಮತ್ತುಸಂಬಂ ಧವಾಚಕನಾಮಪದಗಳು(Easy learning of a Kannada Language: A few tips. Hints for correct and polite conservation, Listening and Speaking Activities, Key to Transcription) 3.Personal Pronouns, Possessive Forms, Interrogative words **Self-Learning topics:** Forced oscillations, LC oscillations. **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3
Module-2	**RBT Level**	**Hrs.**
*Possessive forms of nouns, dubitive question and Relative nouns *ಗುಣಪರಿಮಾಣಮತ್ತುವರ್ಣಬಣ್ಣವಿಶೇಷಣಗಳುಸಂಖ್ಯಾವಾಚಕಗಳು (Qualitative,	L1, L2, L3	3

Quantitative and Colour Adjectives, Numerals) *3. ಕಾರಕರೂಪಗಳುಮತ್ತುವಿಭಕ್ತಿಪ್ರತ್ಯಯಗಳುಸಪ್ತಮಿವಿಭಕ್ತಿಪ್ರತ್ಯಯ(ಆ,ಅದು,ಅವು, ಅಲ್ಲಿ)Predictive Forms, Locative Case **Self-Learning topics:** **Teaching Learning Process** :Chalk and Board, , and Videos **link / Additional online information:**		
Module-3	**RBT Level**	**Hrs.**
*ಚತುರ್ಥಿವಿಭಕ್ತಿಪ್ರತ್ಯಯದಬಳಕೆಮತ್ತುಸಂಖ್ಯಾವಾಚಕಗಳು (Dative Cases, and Numerals) *ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳುಮತ್ತುಬಹುವಚನನಾಮರೂಪಗಳು.(Ordinal numerals and Plural markers) *ನ್ಯೂನಾ /ನಿಷೇಧಾರ್ಥಕಕ್ರಿಯಾಪದಗಳು&ವರ್ಣಗುಣವಾಚಕಗಳುDefective/(Negative Verbs & Colour Adjectives) **Self-Learning topics:** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3
Module-4	**RBT Level**	**Hrs.**
Lasers and Optical Fibers 1.ಅಪ್ಪಣೆಒಪ್ಪಿಗೆನಿರ್ದೇಶನಪ್ರೋತ್ಸಾಹಮತ್ತುಒತ್ತಾಯಅರ್ಥರೂಪಪದಗಳುಮತ್ತು ವಾಕ್ಯಗಳು.(Permission, Commands, encouraging and Urging words (Imperative words and sentences) 2.2. ಸಾಮಾನ್ಯಸಂಭಾಷಣೆಗಳಲ್ಲಿದ್ವಿತೀಯವಿಭಕ್ತಿಪ್ರತ್ಯಯಗಳುಮತ್ತುಸಂಭವನೀಯಪ್ರ ಕಾರಗಳು. Accusative Cases and Potential Forms used in General Communication 3. ಸಹಾಯಕಕ್ರಿಯಾಪದಗಳುಸಂಭಾವ್ಯಸೂಚಕಮತ್ತುನಿಷೇಧಾರ್ಥಕಕ್ರಿಯಾಪದಗಳು. Helping Verbs “iru and iralla”, Corresponding Future and Negation Verbs 4.ಹೋಲಿಕೆಸಂಬಂಧವಸ್ತುಸೂಚಕಪ್ರತ್ಯಯಗಳುಮತ್ತುನಿಷೇಧಾರ್ಥಕಪದಗಳಬಳ ಕೆComparitive, Relationship, Identification and Negation Words	L1, L2, L3	3

Self-Learning topics: **Video link / Additional online information:**		
Module-5	**RBT Level**	**Hrs.**
1.ಕಾಲಮತ್ತುಸಮಯದಹಾಗೂಕ್ರಿಯಾಪದಗಳವಿಧದಪ್ರಕಾರಗಳು(Different types of Tense, Time and Verbs) 2.ಕ್ರಿಯಾಪ್ರತ್ಯಯಗಳೊಂದಿಗೆಭೂತಭವಿಷ್ಯತ್ಮತ್ತುವರ್ತಮಾನಕಾಲಗಳವಾಕ್ಯರಚನೆ(Formation of Past, Future and Present Tense Sentences with Verb Forms) 3.ಸಂಭಾಷಣೆಯಲ್ಲಿದಿನಉಪಯೋಗಿಪದಗಳು(Kannada Vocabulary List) 4Kannada Words in Conversation **Self-Learning topics:** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Video link / Additional online information:**	L1, L2, L3	3

Course outcomes:	
CO1	To understand the necessity of learning of local language for comfortable life.
CO2	To speak, read and write Kannada language as per requirement.
CO3	To communicate (converse) in Kannada language in their daily life with Kannada speakers.
CO4	To Listen and understand the Kannada language properly.
CO5	To speak in polite conservation.

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

26.10.2022

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):

Two Unit Tests each of 30 Marks (duration 01 hour)

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration.

Two assignments each of 20 Marks

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (To have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks

Semester End Examinations (SEE)

SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is 01 hour. The student must secure a minimum of 35% of the maximum marks for SEE.

Text Books:

1.	ಬಳಕೆಕನ್ನಡ ಡಾ. ಎಲ್ತಿಮ್ಮೇಶ

Reference Books:

1.	Mysore university English Kannada dictionary edition 2004(A to Z)

Semester: II		
INNOVATION AND DESIGN THINKING (Theory)		
Course Code: MVJ22IDTK28		**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 explain the concept of design thinking for product and service development
2	To explain the fundamental concept of innovation and design thinking
3	To discuss the methods of implementing design thinking in the real world.

UNIT-I	**L1, L2**
PROCESS OF DESIGN- Understanding Design thinking Shared model in team-based design - Theory and practice in Design thinking - Explore presentation- signers across globe - MVP or Prototyping	**3Hrs**
UNIT-II	**L1, L2**
Tools for Design Thinking Real-Time design interaction capture and analysis - Enabling efficient collaboration in digital space- Empathy for design - Collaboration in distributed Design	**3Hrs**
UNIT-III	**L1, L2**
Design Thinking in IT Design Thinking to Business Process modelling - Agile in Virtual collaboration environment - Scenario based Prototyping	**3Hrs**
UNIT-IV	**L1, L2**
DT For strategic innovations Growth - Story telling representation - Strategic Foresight - Change - Sense Making - Maintenance Relevance - Value redefinition - Extreme Competition - experience design - Standardization -Humanization - Creative Culture - Rapid prototyping, Strategy and Organization - Business Model design.	**3Hrs**
UNIT-V	**L1, L2**
Design thinking workshop, Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test	**3Hrs**

Course Outcomes: After completing the course, the students will be able to	
CO1	Appreciate various design process procedure
CO2	Generate and develop design ideas through different technique
CO3	Identify the significance of reverse Engineering to Understand products
C04	Draw technical drawing for design ideas

Reference Books

1.	John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design", Cengage learning (International edition) Second Edition, 2013.
2.	Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press , 2009.
3.	Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking:

	Understand - Improve - Apply", Springer, 2011
4	Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley Er Sons 2013.
5	Yousef Haik and Tamer M.Shahin, "Engineering Design Process", Cengage Learning, Second Edition, 2011.
6	Book - Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover - 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).

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/P0	P01	P02	P03	PO4	P05	P06	P07	P08	P09	P010	P011	P012
CO1	-	-	-	-	-	1	-	1	2		3	2
CO2	-	-	-	-	-	1	-	1	2		3	2
CO3	-	-	-	-	-	1	-	1	2		3	2
C04	-	-	-	-	-	1	-	1	2		3	2
CO5	-	-	-	-	-	1	-	1	2		3	2