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. Civil Stream -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)	MVJ22MATC21	Mathematics for CV Stream-II	MAT	2	2	2	0	3	50	50	100	4
2	ASC(IC)	MVJ22PHYC22	Applied Physics for CV Stream	PHY	2	2	2	0	3	50	50	100	4
3	ESC	MVJ22CIV23	Engineering Mechanics	CV	2	0	2	0	3	50	50	100	3
4	ESC-II	MVJ22ESCK24D	Introduction to Mechanical Engineering	ME	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 skill in English	ENG	0	2	0	0	1	50	50	100	1
7	HSMS	MVJ22KSK27/ MVJ22KBK27	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	6	8	0	17	400	400	800	**20**

ASC: Applied Science Course, IC-Integrated Course (Theory Course Integrated with Practical Course), ESC-Engineering Science Courses, PLC: Programming Language CourseAEC: Ability Enhancement Course, HSMC: Humanity and Social Science and Management Course, SDC: Skill Development Course.

Course Title	Mathematics-II for Civil Engineering stream	**Semester**	I
Course Code	MVJ22MATC21	**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-II for Civil Engineering stream is to

- Familiarize the importance of Integral calculus and Vector calculus essential for civil engineering.
- Analyze Civil engineering problems by applying Partial Differential Equations.
- Develop the knowledge of solving civil engineering problems numerically.

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

Introduction to Integral Calculus in Civil Engineering applications.

Multiple Integrals: Evaluation of double and triple integrals, evaluation of double integrals by change of order of integration, changing into polar coordinates. Applications to find Area and Volume by double integral, Problems.

Beta and Gamma functions: Definitions, properties, relation between Beta and Gamma functions. Problems.

Self-Study: Volume by triple integration, Center of gravity.

Applications: Applications to mathematical quantities (Area, Surface area, Volume), Analysis of probabilistic models.

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

Introduction to Vector Calculus in Civil Engineering applications.

Vector Differentiation: Scalar and vector fields. Gradient, directional derivative, curl and divergence - physical interpretation, solenoidal and irrotational vector fields. Problems.

Vector Integration: Line integrals, Surface integrals. Applications to work done by a force and flux. Statement of Green's theorem and Stoke's theorem. Problems.

Self-Study: Volume integral and Gauss divergence theorem.

Applications: Heat and mass transfer, oil refinery problems, environmental engineering. Analysis of streamlines, velocity and acceleration of a moving particle.

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

Importance of partial differential equations for Civil Engineering applications

Formation of PDE's by elimination of arbitrary constants and functions. Solution of nonhomogeneous PDE by direct integration. Homogeneous PDEs involving derivatives with respect to one independent variable only. Solution of Lagrange's linear PDE. Derivation of one-dimensional heat equation and wave equation.

Self-Study: Solution of one-dimensional heat equation and wave equation by the method of

separation of variables.

Applications: Design of structures (vibration of rod/membrane)

Module-4	**L1,L2 & L3**	**8 Hours**

Importance of numerical methods for discrete data in the field of Civil Engineering.
Solution of algebraic and transcendental equations: Regula-Falsi and Newton-Raphson methods (only formulae). Problems.
Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula (All formulae without proof). Problems.
Numerical integration: Trapezoidal, Simpson's (1/3)rd and (3/8)th rules (without proof). Problems.

Self-Study: Bisection method, Lagrange's inverse Interpolation.
Applications: Estimating the approximate roots, extremum values, area, volume, and surface area. Finding approximate solutions to civil engineering problems.

Module-5	**L1,L2 & L3**	**8 Hours**

Introduction to various numerical techniques for handling Civil Engineering applications.
Numerical Solution of Ordinary Differential Equations (ODE's): Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor-corrector formula (No derivations of formulae). Problems.

Self-Study: Adam-Bashforth method.
Applications: Finding approximate solutions to ODE related to civil engineering fields.

List of Laboratory experiments

1.	Program to compute surface area, volume, and centre of gravity.
2.	Evaluation of improper integrals.
3.	Finding gradient, divergent, curl and their geometrical interpretation.
4.	Verification of Green's theorem.
5.	Solution of one-dimensional heat equation and wave equation.
6.	Solution of algebraic and transcendental equations by Regula-Falsi and Newton-Raphson Method.
7.	Interpolation/Extrapolation using Newton's forward and backward difference formula.
8.	Computation of area under the curve using Trapezoidal, Simpson's (1/3)rd and (3/8)th rule.
9.	Solution of ODE of first order and first degree by Taylor's series and Modified Euler's Method.
10.	Solution of ODE of first order and first degree by Runge-Kutta 4th order and Milne's predictor-corrector method.

Course outcomes:

CO1	Apply the knowledge of multiple integrals to compute area and volume.
CO2	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, line integral and surface integral.
CO3	Demonstrate partial differential equations and their solutions for physical interpretations.
CO4	Apply the knowledge of numerical methods in solving physical and engineering

	phenomena.
CO5	Get 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	3	0	0	0	0	0	0	1	1
CO2	3	3	0	2	0	0	0	0	0	0	1	0
CO3	3	3	0	3	0	0	0	0	0	0	1	1
CO4	3	3	0	3	0	0	0	0	0	0	1	1
CO5	3	2	3	3	0	0	0	0	0	0	2	2

High-3, Medium-2, Low-1

Course Title	**Applied Physics for CV Stream**	Semester	I/II
Course Code	MVJ22PHYC21	**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 objective is to: Enable students

- Learn the basic concepts in physics which are very essential in understanding and solving engineering related Challenges
- Gain better knowledge of newer concepts in modern Physics for the better appreciation of modern technology.

Module-1	**RBT Level**	**Hrs.**
Oscillations and Shock Waves **Module -I: Oscillations and Shock waves:** **Oscillations:** Simple Harmonic motion (SHM), Differential equation for 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. **Pre-requisites: Basics of Oscillations** **Self-learning: Simple Harmonic motion, Differential equation for SHM** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Laboratory Sessions/ Experimental learning:** 1. Verification of Hooke's law 2. Calculating the time period of oscillations of springs in Series and parallel **Related to Higher semester subjects:** Introduction to aerospace engineering(AE) ,Aerodynamics-I(AS), Engineering Geology(CV),	L1, L2, L3	8

Earthquake engineering (CV),Dynamics of Machines(ME), Advanced Vibrations(ME)		
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. **Pre requisites: Elasticity,Stress & Strain** **Self-learning: Stress-Strain Curve** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Experimental learning:** Model making of types of beams. **Related to Higher semester subjects:** Mechanics of Materials(AE)Aerospace Materials(AE),Material Science(CH), Strength of Materials(CV), MECHANICS OF MATERIALS(ME), MARERIAL SCIENCE(ME), THEORY OF ELASTICITY (Elective)(ME),	L1, L2, L3	8
Module-3	**RBT Level**	**Hrs.**
Acoustics, Radiometry and Photometry: **Acoustics:** Introduction to Acoustics, Types of Acoustics, Reverberation and reverberation time, Absorption power andAbsorption coefficient, Requisites for acoustics in auditorium, Sabine's formula (derivation), Measurement of absorptioncoefficient, Factors affecting the acoustics and remedial measures, Sound Insulation and itsmeasurements. Noise and its Measurements, Impact of Noise in Multi-storied buildings. **Radiometry and Photometry:** Radiation Quantities, Spectral Quantities, Relation between luminance andRadiantquantities, Reflectanceand	L1, L2, L3	8

Transmittance, Photometry (cosinelaw and inverse square law). **Prerequisites: Basicsof Sound, Waves & light properties.** **Self-learning:Introductiontoacoustics.** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Related to Higher semester subjects:** Introduction to astrophysics and Space Environment(AS), Electron Devices/ digital electronics(ECE)		
Module-4	**RBT Level**	**Hrs.**
Photonics **LASER** Properties of a LASER Beam, Interaction of Radiation with Matter, LASER action, Population Inversion, MetastableState,Requisites of a LASER System, Semiconductor LASER, LASER Range Finder, LIDAR, Road Profiling, BridgeDeflection, SpeedChecker, NumericalProblems. **Optical Fiber** Principle and Construction of Optical Fibers, Acceptance angle and Numerical Aperture (NA), Expression for NA, Modes of Propagation,Attenuation and Fiber Losses, Fiber Optic Displacement Sensor, Fiber Optic Temperature Sensor, Numerical Problems **Pre requisite: Propertiesof light.** **Self-learning: Total Internal Reflection.** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Experimental learning:** 1. Demonstration of directionality of Laser light. 2. Model of point to point communication. **Related to Higher semester subjects:** Space vehicle Design(AS) – Laser cutting Highway Engineering(CV)—laser drilling, cutting of metals, Optical fibre communication -(ECE)	L1, L2, L3	8

Module-5	RBT Level	Hrs.
Natural hazards and Safety Introduction, Earthquake, (general characteristics, Physics of earthquake, Richter scale of measurement and earthquake resistant measures), Tsunami (causes for tsunami, characteristics, adverse effects, risk reduction measures, engineering structures to withstand tsunami), Landslide (causes such as excess rain fall, geological structure, human excavation etc.,types of land slide, adverse effects, engineering solution for landslides). Forest Fires and detection using remote sensing. Firehazards and fireprotection, fire-proofing materials, fire safety regulations and fire fighting equipment- Prevention and safety measures. Numerical Problems. **Pre requisite: Oscillations.Self-learning: Richterscale.** **Teaching Learning Process** :Chalk and Board, PowerPoint presentation, and Videos **Experimental learning:** 1. Model making of different crystal structures. 2. Demo of sol-gel method of synthesis of nanoparticles (Zn O) **Related to Higher semester subjects:** Composite of Materials (AE), MATERIAL SCIENCE (CH), Solid Waste Management (CV), and MATERIAL SCIENCE (ME). **Video link / Additional online information:** **Simple Harmonic motion:** https://www.youtube.com/watch?v=k2FvSzWeVxQ **Shock waves:** https://physics.info/shock/ **Shock waves and its applications:** https://www.youtube.com/watch?v=tz_3M3v3kxk **Stress-strain curves:** https://web.mit.edu/course/3/3.11/www/modules/ss.pdf **Stress curves:** https://www.youtube.com/watch?v=f08Y39UiC-o **Oscillations and waves :** https://openstax.org › books › college-physics-2e **Earthquakes:**www.asc-india.org	L1, L2, L3	8

Earthquakes and Hazards: http://quake.usgs.gov/tsunami **Landslide hazards:** http://landslides.usgs.gov **Acoustics:** https://www.youtube.com/watch?v=fHBPvMDFyO8 **Activity Based Learning (Suggested Activities in Class)/ Practical Based learning** http://nptel.ac .in https://swaya m.gov.in https://virtuallabs.merlot.org/vl_physics.html https://phet.colorado.edu https://www.myphysicslab.com		

Course outcomes:	
CO1	**Elucidate** the concepts in oscillations, waves, elasticity and material failures
CO2	**Summarize** concepts of acoustics in buildings and explain the concepts in radiation and photometry
CO3	**Discuss** the principles photonic devices and their application relevant to civil engineering.
CO4	**Describe** the various natural hazards and safety precautions.
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 of Semester End Exam (SEE) is 50%.
The student has to obtain a minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration). Based on this, grades will be awarded.

Continuous Internal Evaluation:
1. Methods suggested: Test, Open Book test, Written Quiz, Seminar, Report writing etc.
2. The class teacher has to decide the topic for closed book test, open book test, Written Quiz and Seminar. In the beginning of the semester, the teacher has to announce the methods of CIE for the subject.

Semester End Examination:
Theory SEE will be conducted by the institution involving the Board of examiners as per the scheduled time table.
1. The question paper will have two parts: Part A and Part B.
2. Part A will contain 1or 2 marks questions for a total of 20 marks.
   Part B will contain 5 questions of 16 marks each.

3. There will be 2 questions from each module in Part B with internal choice. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.	
Text Books:	
1.	Materials Science and Engineering by R Balasubramaniam, second edition, Wiley India Pvt. Ltd. Ansari Road,Daryaganj, New Delhi-110002.
2.	A Textbook of Engineering Physics by M .N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventhedition, S Chand and Company Ltd. New Delhi-110055.
3.	Engineering Physics by R. K. Gaur and S. L. Gupta, 2010 edition, Dhanpat Rai Publications Ltd., New Delhi-110002,
4.	Building Science: Lighting and Accoustics, B. P. Singh and Devaraj Singh, Dhanpat Rai Publications (P) Ltc.,
5.	Building Acoustics : Tor Eric Vigran, Taylor and Francis, 2008 Edition.
6.	Photometry Radiometry and Measurements of Optical Losses, Micheal Bukshtab, Springer, 2nd edition.
7.	Materials Science for Engineers by James F. Shackelford and Madanapalli K Muralidhara, sixth edition, PearsonEducation Asia Pvt. Ltd., New Delhi.
8.	Lasers and Non Linear Optics, B B Loud, New Age Internationals, 2011 edition
9.	Shock waves made simple by Chintoo S Kumar, K Takayama and K P J Reddy: Willey India Pvt. Ltd, Delhi 2014.
10.	An Introduction to Disaster Management, Natural Disastr & Man Made Hazards, S. Vaidyanathan, IKON Books
11.	Natural Hazards, Edward Bryant, Cambridge University, Press, 2nd Edition
12.	Natural Hazards by Ramesh .P. Singh, CRC Press, Taylor and Francis group.
13.	Disaster Education and Management, Rajendra Kumar Bhandari, Springer, India 2014
14.	Principles of Fire Safety Engineering Understanding Fire & Fire Protection, Akhil Kumar Das, PHI Learning , IIEdition.

Reference Books:	
1.	Introduction to Mechanics — MK Verma: 2nd Ed, University Press(India) Pvt Ltd, Hyderabad 2009
2.	Lasers and Non Linear Optics – BB laud, 3rd Ed, New Age International Publishers 2011
3	Solid State Physics-S O Pillai, 8th Ed- New Age International Publishers-2018
4	Nano: The Essentials: Understanding Nanoscience and Nanotechnology- T. Pradeep, Tata McGraw Hill- 2008 Ed

Laboratory Component:

Any Ten Experiments have to be completed from the list of experimentsNote: The experiments have to be classified into

a) Exercise

b) Demonstration

c) Structured Inquiry

d) Open Ended

Based on the convenience classify the following experiments into above categories. Select at least onesimulation/spreadsheet activity.

List of 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 modlus of the material of the given bar Single Cantilever.
9. Determination of the 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.

PHET Interactive Simulations :

(https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype)

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

High-3, Medium-2, Low-1

Semester: II		
ENGINEERING MECHANICS (Theory)		
Course Code: MVJ22CIV23		**CIE Marks:50**
Credits: L:T:P: 2:0:2		**SEE Marks: 50**
Hours:40L		**SEE Duration: 03 Hours**

Course Learning Objectives: The students will be able	
1	To develop students' ability to analyze the problems involving forces, moments with their applications.
2	To analyse the member forces in trusses
3	To make students to learn the effect of friction on different planes
4	To develop the student's ability to find out the centre of gravity and moment of inertia and their applications
5	To make the students learn about kinematics and kinetics and their applications

UNIT-I	**L1, L2**
Resultant of coplanar force system: Basic dimensions and units, Idealisations, Classification of force system, principle of transmissibility of a force, composition of forces, resolution of a force, Free body diagrams, moment, Principle of moments, couple, Resultant of coplanar concurrent force system, Resultant of coplanar non-concurrent force system, Numerical examples.	**8Hrs**
UNIT-II	**L1, L2**
Equilibrium of coplanar force system: Equilibrium of coplanar concurrent force system, Lami's theorem, Equilibrium of coplanar parallel force system, types of beams, types of loadings, types of supports, Equilibrium of coplanar non-concurrent force system, support reactions of statically determinate beams subjected to various types of loads, Numerical examples.	**8Hrs**
UNIT-III	**L1, L2**
Analysis of Trusses: Introduction, Classification of trusses, analysis of plane perfect trusses by the method of joints and method of sections, Numerical examples. **Friction:** Introduction, laws of Coulomb friction, equilibrium of blocks on horizontal plane, equilibrium of blocks on inclined plane, ladder friction, wedge friction Numerical examples.	**8Hrs**
UNIT-IV	**L1, L2**
Centroid of Plane areas: Introduction, Locating the centroid of rectangle, triangle, circle, semicircle, quadrant and sector of a circle using method of integration, centroid of composite areas and simple built up sections, Numerical examples. **Moment of inertia of plane areas:** Introduction, Rectangular moment of inertia, polar moment of inertia, product of inertia, radius of gyration, parallel axes theorem, perpendicular axis theorem, moment of inertia of rectangular, triangular and circular areas from the method of integration, moment of inertia of composite areas and simple built up sections,, Numerical examples.	**8Hrs**
UNIT-V	**L1, L2**

Kinematics: Linear motion: Introduction, Displacement, speed, velocity, acceleration, acceleration due to gravity, Numerical examples on linear motion Projectiles: Introduction, numerical examples on projectiles. **Kinetics:** Introduction, D 'Alembert's principle of dynamic equilibrium and its application in-plane motion and connected bodies including pulleys, Numerical examples.	**8Hrs**

Course Outcomes: After completing the course, the students will be able to	
CO1	Compute the resultant of a force system and resolution of a force
CO2	Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces
CO3	Analyse the frictional resistance offered by different planes
C04	Locate the centroid and compute the moment of inertia of sections
CO5	Analyze the bodies in motion

Reference 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
3.	Beer F.P. and Johnston E. R., Mechanics for Engineers, Statics and Dynamics, 1987, McGraw Hill.
4	Irving H. Shames, Engineering Mechanics, 2019, Prentice-Hall.
5	Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, 2017, Pearson Press.
6	Timoshenko S, Young D. H., Rao J. V., Engineering Mechanics, 5th Edition, 2017, Pearson Press
7	Bhavikatti S S, Engineering Mechanics, 2019, New Age International
8	Reddy Vijaykumar K and Suresh Kumar K, Engineering Mechanics, 2011, BS publication

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

Course Title:	Elements of Electrical Engineering		
Course Code:	MVJ22EEE23	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 objectives

- To explain the basic laws used in the analysis of DC circuits, electromagnetism.
- To explain the behavior of circuit elements in single-phase circuits.
- To explain three phase circuits, balanced loads and measurement of three phase power.
- To explain the measuring techniques, measuring instruments anddomestic wiring.
- To explain electricity billing, equipment and personal safety measures.

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. Chalk and talk
2. Animated/NPTEL videos
3. Cut sections
4. PPTs

Module-1 (08 Hrs)

DC circuits: Ohm's law and Kirchhoff's laws, analysis of series, parallel and series-parallel circuits. Power and energy.

Electromagnetism: Faraday's Laws of Electromagnetic Induction, Lenz's Law, Flemings rules, statically and dynamically induced EMF; concepts of self and mutual inductance. Coefficient of Coupling. Energy stored in magnetic field. Simple Numerical.

Module-2 (08 Hrs)

Single-phase AC circuits: Generation of sinusoidal voltage, frequency of generated voltage, average value, RMS value, form factor and peak factor of sinusoidal voltage and currents.

Phasor representation of alternating quantities. Analysis of R, L, C, R-L,R-C and R-L-C circuits with phasor diagrams, Real power, reactive power, apparent power, and Power factor. Series, Parallel and Series-Parallel circuits. Simple Numerical.

Module-3(08 Hrs)

Three-phase AC circuits: Necessity and advantage of 3-phase system. Generation of 3-phase power. Definition of phase sequence. Balanced supply and balanced load. Relationship between line and phase values of balanced star and delta connections. Power in balanced 3-phase circuits. Measurement of 3-phase power by 2-wattmeter method.Simple Numerical.

Module-4(08 Hrs)

Measuring instruments:construction and working principle of whetstone's bridge, Kelvin's double bridge, Megger, Maxwel's bridge for inductance, Schering's bridge for capacitance, concepts of current transformer and potential transformer. (Only balance equations and Excluding Vector diagram approach)

Domestic Wiring: Requirements, Types of wiring: casing, capping. Two way and three way control of load.

Module-5 (08 Hrs)

Electricity bill: Power rating of household appliances including air conditioners, PCs, laptops, printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.

Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock, and Residual Current Circuit Breaker (RCCB) and Earth Leakage Circuit Breaker (ELCB).

Course outcome (Course Skill Set)

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

CO1	Understand the concepts of DC circuits and Electromagnetism.
CO2	Understand the concepts of single phase and Three phase AC circuits.
CO3	Apply the basic Electrical laws to solve circuits.
CO4	Understand the concepts of measurements and measuring Instruments
CO5	Explain the concepts of domestic wiring, electricity billing, circuit protective devices and personal safety measures.

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):

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.

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/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 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)

Text Books:

1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Electrical Technology by E. Hughes, Pearson, 12th Edition, 2016.
4. Electrical and electronic measurements and instrumentation by A K Sawhney, Dhanapat Rai and Co. edition, January 2015

Web links and Video Lectures (e-Resources):

- www.nptel.ac.in

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

- Wherever required, faculty shall demonstrate the concepts through laboratory experiments.

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	0	1	1	1	1	0	0	0	1
CO2	3	3	2	1	1	1	0	0	0	0	0	1
CO3	3	2	1	1	1	1	1	1	0	0	0	1
CO4	3	2	2	1	0	1	1	1	0	0	0	1
CO5	3	1	2	0	1	2	1	1	0	0	1	1

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

Course Title:	INTRODUCTION TO MECHANICAL ENGINEERING		
Course Code:	MVJ22ESCK24D	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

- To develop basic Knowledge on Mechanical Engineering, Fundamentals and Energy Sources.
- Understand the concept of different types of Machine tool operations and Modern Manufacturing Processes like CNC, 3D printing.
- To know the concept of IC engines and Future Mobility vehicles.
- To give exposure in the field of Engineering Materials and Manufacturing Processes Technology and its applications
- To acquire a basic understanding role of Mechanical Engineering in the Robotics and Automation in industry.

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 fosters students Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information.

Module-1 (8 hours)

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

Energy: Introduction and applications of Energy sources like Fossil fuels, Nuclear fuels, Hydel, Solar, wind, and bio-fuels, Environmental issues like Global warming and Ozone depletion

Module-2 (8 hours)

Machine Tool Operations:

Working Principle of lathe, Lathe operations: Turning, facing, knurling. Working principles of Drilling Machine, drilling operations: drilling, boring, reaming. Working of Milling Machine, Milling operations: plane 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-Strokes Petrol and Diesel Engines, Application of IC Engines.

Insight into Future Mobility; Electric and Hybrid Vehicles, Components of Electric and Hybrid Vehicles. Advantages and disadvantages of EVs and Hybrid vehicles.

Module-4 (8 hours)

Engineering Materials: Types and applications of Ferrous & Nonferrous Metals, silica, ceramics, glass, graphite, diamond and polymer. Shape Memory Alloys.

Joining Processes: Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding and types of flames.

Module-5 (8 hours)

Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems. Classification based on robotics configuration: polar cylindrical, Cartesian coordinate and spherical. Application, Advantages and disadvantages.
Automation in industry: Definition, types – Fixed, programmable and flexible automation, basic elements with block diagrams, advantages.
Introduction to IOT: Definition and Characteristics, Physical design, protocols, Logical design of IoT, Functional blocks, and communication models.

Course Outcome (Course Skill Set)

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

CO1	Explain the concepts of Role of Mechanical Engineering and Energy sources.
CO2	Describe the Machine Tool Operations and advanced Manufacturing process.
CO3	Explain the Working Principle of IC engines and EV vehicles.
CO4	Discuss the Properties of Common Engineering Materials and various Metal Joining Processes.
CO5	Explain the Concepts of Mechatronics, Robotics and Automation in IoT

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/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 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)

Text Books:

1. Elements of Mechanical Engineering, K R Gopala Krishna, Subhash Publications, 2008
2. An Introduction to Mechanical Engineering, Jonathan Wickert and Kemper Lewis, Third Edition, 2012

Reference Books:

1. Elements of Workshop Technology (Vol. 1 and 2), Hazra Choudhry and Nirzar Roy, Media Promoters and Publishers Pvt. Ltd., 2010.
2. Manufacturing Technology- Foundry, Forming and Welding, P.N.Rao Tata McGraw Hill 3rdEd., 2003.
3. Internal Combustion Engines, V. Ganesan, Tata McGraw Hill Education; 4th edition, 2017
4. Robotics, Appu Kuttan KK K. International Pvt Ltd, volume 1
5. Dr SRN Reddy, Rachit Thukral and Manasi Mishra, " Introduction to Internet of Things: A Practical Approach", ETI Labs
6. Raj kamal, " Internet of Things: Architecture and Design", McGraw hill.

Web links and Video Lectures (e-Resources):

- 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

- Demonstration of lathe/milling/drilling operations
- Demonstration of working of IC Engine.
- Study arc welding, oxy-acetylene gas flame structure.
- Video demonstration of latest trends in mobility robotics and Automation
- Demonstration of developing models on machine tools

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

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 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**							

Course Title	Professional Writing Skills in English	**Semester**	02
Course Code	MVJ22PWSK26	**CIE**	50
Total No. of Contact Hours	02	**SEE**	50
No. of Contact Hours/week	35hours	**Total**	100
Credits	01	**Exam. Duration**	3 Hours

Course objective is to:

- To use English vocabulary aptly and flawlessly and ensure language proficiency.
- To achieve better technical writing and Presentation skills
- To Identify the common errors in Spoken and Written English
- To acquire Employment and Workplace communication skills

Language Lab:

To augment LSRW and GV skills (Listening, Speaking, Reading, Writing, Grammar and Vocabulary) through tests, activities, exercises etc. via comprehensive web-based learning and assessment systems

Module-1	**RBT Level**	**Hours**

Syllabus Content:

Introduction to Technical Communication

1.1 Subject Verb Agreement (Concord Rules with Exercises)

1.2 Common errors in Subject-verb agreement, Noun-pronoun agreement

1.3 Common errors in the use of Adjectives, Adverbs and Conjunctions; misplaced modifiers

1.4 Word Order, errors due to the confusion of words

1.5 Anagrams, palindromes, puns

1.6 Idioms and phrases – common errors

1.7. Honing reading skills

Video Links/Any other special information (Papers): (For additional study on the concepts of contents)

Module-2	**RBT Level**	**Hours** **7 hrs**

Syllabus Content:

The Nuances of Writing

1.1 Organizing Principles of Paragraphs in Documents

1.2 Developing hints into organized paragraphs

1.3 Dialogue writing.

1.4 Contextual vocabulary

1.5 Importance of proper Punctuation

1.6 One-word substitutes

1.7 Polishing writing skills – similes and metaphors

1.8 The Art of Condensation (Precise writing)

1.9 Word collocations

1.10 Redundancy and jargon in writing

1.11 Techniques in creative writing

1.12 Common Errors due to Indianism in English Communication

Video Links/Any other special information (Papers): (For additional study on the concepts of contents)

Module-3	**RBT Level**	**Hours 7 hrs**

Syllabus Content:

Honing Writing Skills

1.1 Effective Technical Reading and Writing Practices

1.2 Tips for good and effective writing

1.3 Parallelism in sentence structures

1.4 Describing processes

1.5 Interpretation of non-verbal data – pie-charts, flow charts etc.

1.6 Use of Passive Voices in Report writing

1.7 Report writing.

1.8 Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.

Video Links/Any other special information (Papers): (For additional study on the concepts of contents)

Module-4	**RBT Level**	**Hours 7 hrs**

Syllabus Content:

Writing Emails and Letters

1.1 Components of a Formal Letter

1.2 Formats and Types of Business Letters

1.3 Email Writing – Dos and Don’ts

Practice in writing various types of emails.

Video Links/Any other special information (Papers): (For additional study on the concepts of contents)

Module-5	**RBT Level**	**Hours 7 hrs**

Syllabus Content:

Non-Verbal Communication

1.1 Significance of non-verbal communication

1.2 Body Language

1.3 Group Discussion

1.4. Describing people

1.5. Describing events and scenes

1.4 Presentation skills and Formal Presentations by Students

Video Links/Any other special information (Papers): (For additional study on the concepts of contents)

Course outcomes:	
CO1	Identify common errors in Spoken and Written communication
CO2	Reach higher levels of perfection in English vocabulary and language
CO3	Improve nature and style of sensible writing and acquire employment and workplace communication. skills
CO4	Improve their Technical Communication Skills through Technical Reading and Writing practices
CO5	Perform well at campus recruitment, engineering and other competitive examinations

Textbooks:	
1	**English Communication Made Easy** by Chitra Laxman – Sathyasri Printers Pvt. Ltd.
Reference Books:	
1	**Technical Communication** by Gajendra Singh Chauhan and Et al, Cengage learning India Pvt Limited [Latest Revised Edition} - 2018.
2	**Communication Skills** by Sanjay Kumar and Pushpa Lata, Oxford University Press - 2018
3	**High School English Grammar & Composition** by Wren and Martin, S Chandh& Company Ltd. 2015
4	**English Language Communication Skills - Lab Manual cum Workbook,** Cengage learning India Pvt. Limited [Latest Revised Edition} - 2018
5	**Technical Communication -** Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharron, Oxford University Press 2017
6	**Effective Technical Communication -** Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private Limited - 2018

CIE Assessment:
CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Two Internal Assessment (IA) tests during the semester (25 marks each), the final IA marks to be awarded will be the average of two tests. - Assignments and activities(25marks)
SEE Assessment:
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 of 1 mark each for total of 40 marks covering the whole syllabus. ii. Part B also covers the entire syllabus consisting of one question having choices, carrying 10 marks. One question must be set from units having descriptive topics. The duration of the examination is 2 hours.

CO-PO Mapping												
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 ಬೇಂದ್ರೆ * 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. (ವೈಯಕ್ತಿಕ ಸಾಮ್ಯ ಸೂಚಕ ಸಂಬಂಧಿತ ಸರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು) 2. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು ಸಂದೇಹಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧ ವಾಚಕ ನಾಮಪದಗಳು(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 *ಗುಣ ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣ ಬಣ್ಣ ವಿಶೇಷಣಗಳು ಸಂಖ್ಯಾ ವಾಚಕಗಳು (Qualitative, Quantitative and Colour Adjectives, Numerals) *3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಸಪ್ತಮಿ ವಿಭಕ್ತಿ	L1, L2, L3	3

ಪ್ರತ್ಯಯ(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.**
*ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾ ವಾಚಕಗಳು (Dative Cases, and Numerals) *ಸಂಖ್ಯಾ ಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮ ರೂಪಗಳು.(Ordinal numerals and Plural markers) *ನ್ಯೂನಾ /ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು & 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. ಅಪ್ಪಣೆ ಒಪ್ಪಿಗೆ ನಿರ್ದೇಶನ ಪ್ರೋತ್ಸಾಹ ಮತ್ತು ಒತ್ತಾಯ ಅರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು.(Permission, Commands, encouraging and Urging words (Imperative words and sentences) 2. 2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು. Accusative Cases and Potential Forms used in General Communication 3. ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು ಸಂಭಾವ್ಯ ಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು.Helping Verbs “iru and iralla”, Corresponding Future and Negation Verbs 4. ಹೋಲಿಕೆ ಸಂಬಂಧ ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ Comparitive, Relationship, Identification and Negation Words **Self-Learning topics:** **Video link / Additional online information:**	L1, L2, L3	3

Module-5	**RBT Level**	**Hrs.**
1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾ ಪದಗಳ ವಿಧದ ಪ್ರಕಾರಗಳು(Different types of Tense, Time and Verbs) 2. ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲಗಳ ವಾಕ್ಯ ರಚನೆ(Formation of Past, Future and Present Tense Sentences with Verb Forms) 3. ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನ ಉಪಯೋಗಿ ಪದಗಳು(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.	ಬಳಕೆ ಕನ್ನಡ ಡಾ. ಎಲ್ ತಿಮ್ಮೇಶ

Reference Books:

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

INNOVATION AND DESIGN THINKING

(Theory)

Course Code: MVJ22IDTK28/18		**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 captures 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 Workshop 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