

**P. E. S. COLLEGE OF ENGINEERING, MANDYA**  
**Scheme of Teaching and Examinations - 2025**  
**Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2025-26)**

B.E. II – Semester [Physics Group]		Stream: –Civil Engineering Stream (CES)		Programme: Civil Engineering									
Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination			Credits	
					Theory Lecture	Tutorial	Practical/Drawing	SAAE	SEE Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P	S					
1	ASC	P25MACV201	Differential Calculus and Numerical Methods	Mathematics	3	2	0		03	50	50	100	04
2	ASC	P25CHCV202	Physics for Sustainable Structural System	Physics	3	0	0		03	50	50	100	03
3	ETC	P25ETC203	Introduction to AI and Applications	Respective Engineering dept	2	0	2		03	50	50	100	03
4	ESC	P25ESC2042	Introduction to Electrical Engineering	EEE	3	0	0		03	50	50	100	03
5	PSC	P25PSC2051	Engineering Mechanics	Respective Engineering dept	3	0	0		03	50	50	100	03
6	PSCL	P25PSCL2061	Mechanics and Materials Laboratory	Respective Engineering dept	0	0	2		03	50	50	100	01
7	ASC	P25CHCVL207	Physics for Sustainable Structural System Laboratory	Physics	0	0	2		03	50	50	100	01
8	AEC	P25ENG208	Communicative English – II	Humanities	0	2	0		02	50	50	100	01
9	AEC/ SDC	P25IDT209	Interdisciplinary Project Based Learning	Any Dept	0	0	2		02	50	50	100	01
10	HSMS	P25KSK210/ P25KBK210	Sanskritika Kannada/ Balake Kannada	Humanities	1	0	0		01	100	--	100	PP
<b>TOTAL</b>										<b>550</b>	<b>450</b>	<b>1000</b>	<b>20</b>
<b>10</b>	<b>AICTE Activity Points</b> (students have to earn <b>100</b> activity points between 01 to 08 semesters)				Compulsory requirement for the award of a degree								

<p><b>S- (SAAE)</b> Students Academic Activity Engagement Hours, <b>ASC</b>-Applied Science Course, <b>ESC</b>- Engineering Science Courses, <b>IC</b> – Integrated Course (Practical Course Integrated with Theory Course), <b>PLC(IC)</b>- Programming Language Course (Integrated Course), <b>AEC</b>- Ability Enhancement Course, <b>AEC/SDC</b>- Ability Enhancement Course/Skill Development course, <b>ETC</b>- Emerging Technology Course, <b>TD/PSB</b>-Teaching Department / Paper Setting Board, <b>HSMC</b>-Humanity, Social Science and management Course, <b>CIE</b> –Continuous Internal Evaluation, <b>SEE</b>- Semester End Examination, <b>NCMC</b>: Non Credit Mandatory Course, <b>PP</b> : (Pass/Pass) is assigned to a non-credit course. “PP” represents pass in course provided students have successfully completed the CIE requirements. Otherwise, “NP-not pass shall be awarded. “PP” is essential for the award of the degree</p>	
<p><b>Credit Definition:</b>  <b>01</b>– hour Lecture (<b>L</b>) per week=<b>1 Credit</b>  <b>01</b>– hours Tutorial(<b>T</b>) per week=<b>1 Credit</b>  <b>01</b> – hour Practical/Drawing per week = <b>1 Credit</b></p>	<p>04-Credits courses are to be designed for 50 hours of Teaching-Learning Session  04-Credits (IC) are to be designed for 40 hours’ theory and 10-12 hours of practical sessions  03-Credits courses are to be designed for 40 hours of Teaching-Learning Session  02- Credits courses are to be designed for 25 hours of Teaching-Learning Session  01-Credit courses are to be designed for 12 hours of Teaching-Learning sessions</p>
<p>The <b>Student Induction Programme</b> (SIP), initiated by the All-India Council for Technical Education (AICTE), is designed to help newly admitted students in technical institutions transition smoothly into the higher education environment. It aims to familiarize students with the institutional culture, foster connections with peers and faculty, and provide a foundation for holistic learning. The first year of Engineering programmes is composed of I semester and II semester and Summer Semester. SIP activities shall be scheduled in the afternoon sessions during the first week of class commencement of I and II semesters only. Activities under SIP may include Physical Activities, Creative Arts, Universal Human Values, Literary Events, Proficiency Modules, Lectures by Eminent Personalities, Local Area Visits, Department/Branch Familiarization, and Innovation-related sessions. The specific programmes to be conducted will be notified separately by the University, with the academic calendar or separately.</p>	
<p><b>AICTE Activity Points Requirement for BE/B.Tech. Programmes</b>  As per AICTE guidelines (refer Chapter 6 – <i>AICTE Activity Point Program, Model Internship Guidelines</i>), in addition to academic requirements, students must earn a specified number of <b>Activity Points</b> to be earned is to be eligible for the award of their degree.</p> <ul style="list-style-type: none"> <li>• <b>Regular students</b> admitted to a 4-year degree program must earn <b>100 Activity Points</b>.</li> <li>• <b>Lateral entry students</b> (joining from the second year) must earn <b>75 Activity Points</b>.</li> </ul> <p><b>Students transferred</b> from other universities directly into the fifth semester must earn <b>50 Activity Points</b> from the date of entry into VTU. These Activity Points are <b>non-credit</b> and will not be considered for <b>the SGPA/CGPA</b> or be used for <b>vertical progression</b>. However, they are mandatory for the <b>award of the degree</b>, and the points earned will be reflected on the <b>eighth semester Grade Card</b>. The hours spent for earning the activity points shall not be counted for regular attendance requirements. Students can accumulate these points at any time during their program, including on weekends, holidays, and vacations starting from the year of admission, provided they meet the minimum hours of engagement prescribed for each activity. If a student fails to earn the required Activity Points, the eighth-semester Grade Card will be withheld until the requirement is fulfilled. Consequently, the degree will be awarded only after the Grade Card has been released.</p>	

Applied Mathematics - II					Applied Chemistry				
Code	Title	L	T	P	Code	Title	L	T	P
P25MACV101	Differential Calculus and Linear Algebra: CV Stream	3	2	0	P25CHCV102	Applied Chemistry for Sustainable Built Environment (CV)	3	0	0
P25MAME101	Differential Calculus and Linear Algebra: ME Stream	3	2	0	P25CHME102	Applied Chemistry for Metal Protection and Sustainable Energy (ME)	3	0	0
P25MAEE101	Differential Calculus and Linear Algebra: EEE Stream	3	2	0	P25CHEE102	Applied Chemistry for Futuristic Devices (EEE, ECE)	3	0	0
P25MACS101	Calculus and Linear Algebra: CSE Stream	3	2	0	P25CHCS102	Applied Chemistry for Smart Systems (CSE)	3	0	0
<b>(ESC-I) Engineering Science Courses-II</b>					<b>(PLC) Programming Language Courses and Laboratory</b>				
Code	Title	L	T	P	Code	Title	L	T	P
P25ESC1041	Introduction to Building Sciences	3	0	0	P25PLC1051	Introduction to C Programming (For none IT programmes)	3	0	0
P25ESC1042	Introduction to Electrical Engineering	3	0	0	P25PLC1052	Python Programming (for CSE and allied programmes)	3	0	0
P25ESC1043	Introduction to Electronics & Communication	3	0	0	P25PLCL1061	Introduction to C Programming Laboratory (For none IT programmes)	0	0	2
					P25PLCL1062	Python Programming Laboratory (For CSE and allied programmes)	0	0	2
P25ESC1044	Introduction to Mechanical Engineering	3	0	0	<b>Computer Aided Engineering Drawing</b>				
P25ESC1045	Essentials of Information Technology	3	0	0	P25ESC1031	Computer Aided Drawing for CV Stream	2	0	2
					P25ESC1032	Computer Aided Drawing for ME stream Engineering	2	0	2
	<b>Applied Chemistry Lab (ASC Lab)</b>				P25ESC1033	Computer Aided Drawing for EEE stream	2	0	2
P25CHCVL107	Applied Chemistry Laboratory (Applied Chemistry for Sustainable Built Environment)	0	0	2	P25ESC1034	Computer Aided Drawing for CSE stream	2	0	2
<p><b>The Mathematics/Chemistry courses shall be taught by a single faculty member per session, with no sharing of the course (subject) modules. The tutorial sessions for the mathematics course shall be conducted in the Laboratory environment using MATLAB software to enhance computational understanding and application skills.</b></p> <p>Students admitted to a specific engineering stream are required to select and successfully complete <b>Applied Mathematics-I</b> and <b>Applied Chemistry courses</b> that are aligned with their program stream. These courses are intended to reinforce the academic foundations and develop the professional competencies relevant to their chosen engineering discipline.</p> <p><b>Engineering Sciences Courses-I (ESC-I):</b> These courses are designed to broaden the technical knowledge of students beyond their core area of study. These courses enable students to gain a foundational understanding of engineering principles from other stream courses. Students are required to select and complete two courses that are not belong to their admitted program stream. For example, a student admitted to the any programme of the Civil Engineering stream should not select Introduction to Building Sciences but any other two. One course shall select under ESC-I and another course under ESC-II. The two courses must be different from the other.</p>									

For the course **Interdisciplinary Project**, it is mandatory to form a team comprising students from multiple engineering disciplines. For example, a project team may include students from Mechanical Engineering, Electronics and Communication Engineering (ECE), and Computer Science and Engineering (CSE), working collaboratively to design and implement the project.

**Computer-Aided Engineering Drawing:** The courses under this category are stream-specific. Students must select and complete the course that corresponds to their admitted engineering stream.

## II Semester

Course Title	Differential Calculus and Numerical Methods						
Course Code	P25MACV201						
Category	COMMON TO CVSTREAMS						
Scheme and Credits	Theory/Practical/Integrated					Total teaching hours	Credits
	L	T	P	SS	Total		
	3	2	0	-	04	(40 Hours Theory+20 Hours Tutorial)	04
CIE Marks:50	SEE Marks:50		Total Max. marks=100		Duration of SEE:03Hours		

## Course Learning Objectives:

1	Apply the concepts of integral calculus, partial differential equations, and vector calculus to model and solve problems in engineering applications such as area, volume, heat conduction, and field analysis.
2	Apply appropriate numerical methods to find approximate solutions of algebraic, transcendental, and ordinary differential equations and to perform interpolation and numerical integration in engineering contexts.
3	Demonstrate the applications of civil engineering and allied engineering science using modern ICT tools.

Unit	Syllabus content	No. of hours
I	<b>Integral Calculus:</b> 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. Beta and Gamma functions: Definitions, properties, relation between Beta and Gamma functions. <b>Self-Study:</b> Volume by triple integration, Center of gravity.	8 hours
II	<b>Partial Differential Equations (PDE):</b> Formation of PDEs by elimination of arbitrary constants and functions. Solution of non-homogeneous PDE by direct integration. Homogeneous PDEs involving derivatives with respect to one independent variable only. Method of Separation of variables. Application of PDE: Derivation of one-dimensional heat equation and wave equation. <b>Self-Study:</b> Solution of PDE by Lagrange method.	8 hours
III	<b>Vector Calculus:</b> Scalar and vector fields. Gradient, directional derivative, divergence and curl - physical interpretation, solenoidal vector fields, irrotational vector fields and scalar potential. Vector Integration: Line integrals, work done by a force and flux, Statements of Green's theorem and Stoke's theorem, problems without verification. <b>Self-Study:</b> Volume integral and Gauss divergence theorem.	8 hours
IV	<b>Numerical Methods – 1:</b> Solution of algebraic and transcendental equations: Regula-Falsi and Newton-Raphson methods, problems. Interpolation: Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation	8 hours

	formula. Numerical integration: Trapezoidal, Simpson's 1/3 <sup>rd</sup> and 3/8 <sup>th</sup> rules. <b>Self-Study:</b> Boole's rule	
V	<b>Numerical Methods – 2:</b> 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, Milne's predictor-corrector method and Adams-Bashforth predictor-corrector method. <b>Self-Study:</b> Runge-Kutta method of second order	8 hours

**COURSE OUT COMES:** On completion of the course, student should be able to:

**CO1:** Apply the concepts of integral calculus, partial differential equations, and vector calculus to model and solve problems in engineering applications such as area, volume, heat conduction, and field analysis.

**CO2:** Apply appropriate numerical methods to find approximate solutions of algebraic, transcendental, and ordinary differential equations and to perform interpolation and numerical integration in engineering contexts.

**CO3:** Demonstrate the applications of civil engineering and allied engineering science using modern ICT tools.

**TEACHING – LEARNING PROCESS:** Chalk and Talk, power point presentation, animations, videos.

**Suggested Learning Resources :( Textbook/Reference Book):**

**Textbooks:**

1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44<sup>th</sup> Ed., 2021.
2. E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 10<sup>th</sup> Ed., 2018.
3. M. K. Jain, S. R. K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publishers, 8<sup>th</sup> Ed., 2022.

**Reference books:**

1. B. V. Ramana, Higher Engineering Mathematics, McGraw-Hill Education, 11<sup>th</sup> Ed., 2017
2. Srimanta Pal & Subodh C. Bhunia, Engineering Mathematics, Oxford University Press, 3<sup>rd</sup> Ed., 2016.
3. N. P. Bali and Manish Goyal, A Textbook of Engineering Mathematics, Laxmi Publications, 10<sup>th</sup> Ed., 2022.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S. Chand Publication, 3<sup>rd</sup> Ed., 2014.
5. Steven V. Chapra and Raymond P. Canale, Applied Numerical Methods with Matlab for Engineers and Scientists, McGraw-Hill, 3rd Ed., 2011.
6. Richard L. Burden, Douglas J. Faires and A. M. Burden, Numerical Analysis, 10th Ed., 2010, Cengage Publishers.
7. S. S. Sastry, Introductory Methods of Numerical Analysis, PHI Learning Private Limited, 5th Ed., 2012.

**Web links and Video Lectures (e-Resources):**

- <http://academicearth.org/>
- VTU e-Shikshana Program
- VTU EDUSAT Program
- <https://nptel.ac.in/courses/111105160>
- <https://nptel.ac.in/courses/127106019>
- <https://ocw.mit.edu/courses/18-335j-introduction-to-numerical-methods-spring-2019/>
- <https://ocw.mit.edu/courses/18-330-introduction-to-numerical-analysis-spring-2012/pages/syllabus/>

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2										
CO2	2	3										
CO3	3	2										
<b>Strength of correlation:</b> Low-1, Medium-2, High-3												

<b>Academic Year: 2025-26</b>		
<b>Course Title:</b> Physics for Sustainable Structural Systems		
<b>Course Code:</b> P25PHCV202	<b>Semester:</b> II	<b>Scheme:</b> P25
<b>Teaching hours/week (L: T:P):</b> (3:0:0)	<b>CIE Marks:</b> 50	<b>CIE Weightage:</b> 50%
<b>Credits:</b> 03	<b>SEE Marks:</b> 50	<b>SEE Weightage:</b> 50%
<b>Teaching hours of Pedagogy:</b> 40 hours Theory	<b>Total:</b> 100	<b>Exam Hours:</b> 3 Hours
<b>Course Learning Objectives:</b>		
<ul style="list-style-type: none"> <li>• To <b>understand</b> the principles of free and forced oscillations, resonance, damping and vibrations in structural systems.</li> <li>• To <b>study</b> the properties of mechanical waves, wave propagation in elastic media and their influence on the behavior and stability of civil structures.</li> <li>• To <b>study</b> acoustics and light measurements for sustainable design and energy efficiency in civil structures.</li> <li>• To <b>explore</b> non-destructive testing techniques for structural strength monitoring.</li> <li>• To <b>study</b> the physics of smart materials for developing sustainable and adaptive structural systems.</li> </ul>		
<b>UNIT-I</b>		<b>Hours: 08</b>
<b>Oscillations:</b> Simple harmonic motion (SHM), Differential equation for SHM, Springs: 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. Resonance in LCR Circuits (Qualitative), Numerical Problems.		
<b>Prerequisite:</b> Fundamentals of physics and wave theory		
<b>Self-Study Component:</b> Theory of forced oscillations		
<b>UNIT - II</b>		<b>Hours: 08</b>
<b>Waves and their role in structural behavior:</b> Types of waves, Wave propagation in beams, rods and slabs, Boundary effects, Wave dispersion, Damping in structures, Energy dissipation techniques in structures, Introduction to earthquakes, General characteristics, P-waves, S-waves, Love waves, and Rayleigh waves, Ground motion and structural response, Site effects and soil-structure interaction, Physics of earthquakes, Richter scale of measurement and earthquake-resistant measures, Tsunami (causes for tsunami, characteristics, adverse effects, risk reduction measures, engineering structures to withstand tsunami), Seismometer and Seismograph, Accelerometer.		
<b>Prerequisite:</b> Basics of mechanics and structural dynamics		
<b>Self-Study Component:</b> Seismometer and Seismograph, Accelerometer		
<b>UNIT - III</b>		<b>Hours: 08</b>
<b>Acoustics, Radiometry and Photometry:</b> Acoustics: Introduction to Acoustics, Types of Acoustics, Reverberation and reverberation time, Absorption power and Absorption coefficient, Requisites for acoustics in auditorium, Sabine's formula (derivation),		

Measurement of absorption coefficient, Factors affecting the acoustics and remedial measures, Sound insulation and its measurements. Noise and its measurements, Impact of noise in multi-storied buildings.	
<b>Radiometry and Photometry:</b> Radiation quantities, Spectral quantities, Relation between luminance and Radiant quantities, Reflectance and Transmittance, Photometry (cosine law and inverse square law).	
<b>Prerequisite:</b> Basics of sound and light propagation	
<b>Self-Study Component:</b> Cosine law and inverse square law	
<b>UNIT - IV</b>	<b>Hours: 08</b>
<b>Non-Destructive Testing:</b> Introduction to NDT, Need for inspection, Types of inspection system, Benefits of NDT. Visual inspection, Liquid penetration test: Principles surface separation, Penetrant application and development, Eddy present testing: Inspection probes, Display methods, Ultrasonic testing: Principle, Generation of Ultrasonic, Probes, Radiography: Radiation sources, Attenuation of radiation, Shadow formation and distortion, Identification Markers, Numerical Problems.	
<b>Prerequisite:</b> Knowledge of instrumentation and radiation	
<b>Self-Study Component:</b> Shadow formation and distortion	
<b>UNIT - V</b>	<b>Hours: 08</b>
<b>Smart Materials for Sustainable Structures:</b> Types of smart materials, Piezo, Magneto-strictive, Electro-strictive, Electro-rheological, Magneto-rheological, Shape memory alloys, Phase transformation in shape memory alloys, Overview of sensor technology, uses of sensors in intelligent structures, Classification of sensors, Temperature sensor, Vibration Sensor, Strain Gauge sensors, Basic concepts of structural health monitoring.	
<b>Prerequisite:</b> Material science and circuit fundamentals	
<b>Self-Study Component:</b> Classification of sensors	

<b>Suggested Learning Resources:</b>				
<b>Text books:</b>				
Sl. No	Title	Author	Year & Edition	Publisher
1.	Physics, Oscillations and Waves, Optics and Quantum Mechanics	H M Agarwal and R M Agarwal	2025	Pearson
2.	Engineering Physics	Satyendra Sharma and Jyotsna Sharma	2018	Pearson
3	Dynamics of Structures - Theory and Applications to Earthquake Engineering	Anil K. Chopra, University of California at Berkeley	Fourth Edition	Prentice Hall
4	Non-destructive Testing	Hull J B & John V	2015	Macmillan International Higher Education.
5	Smart Materials in Structural Health Monitoring, Control and Biomechanics	Suresh Bhalla (IIT Delhi), C. K. Soh, Yaowen Yang	--	Springer

Reference Books:				
1.	Vibrations and Waves	A P French	2003	MIT introductory Physics
2.	Engineering Physics	R K Gaur and S L Gupta	2010 edition	Dhanpat Rai Publications Ltd., New Delhi-110002
3.	Engineering Physics	S L Kakani, Shubra Kakani	3rd Edition, 2020	CBS Publishers and Distributers Pvt. Ltd., 2018
4.	Introduction to Seismology, Earthquakes, and Earth Structure	Stein, Seth and Michael Wysession	2003	Blackwell Publishing
5.	Photometry Radiometry and Measurements of Optical Losses	MichealBukshtab	2nd edition	Springer
6.	Engineering Physics	S Mani Naidu	2025	Pearson
7.	Building Science: Lighting and Acoustics	B P Singh and Devaraj Singh	--	Dhanpat Rai Publications (P) Ltc.
8.	Shape Memory Alloys: Modeling and Engineering Applications	Lagoudas D C	2008	Springer ISBN: 978-0-387-47684-1
9.	Smart Structures: Requirements and Potential Applications in Mechanical and Civil Engineering	Holnicki-Szulc J & Rodellar J (Eds.)	1999	Springer ISBN: 978-0-7923-5612-7

#### Weblinks and Video Lectures (e-resources)

1. Simple Harmonic Motion (SHM) – NPTEL Lecture:  
<https://www.youtube.com/watch?v=gnD8Se92hfk>.
2. Waves and Oscillations Playlist (SHM, damping, resonance, etc.)– NPTEL  
[https://www.youtube.com/playlist?list=PLyqSpQzTE6M9X7oRXliYM8t0aaR\\_N0Cs\\_d](https://www.youtube.com/playlist?list=PLyqSpQzTE6M9X7oRXliYM8t0aaR_N0Cs_d).
3. . Simple Harmonic motion: <https://www.youtube.com/watch?v=k2FvSzWeVxQ>.
4. Stress- strain curves :<https://web.mit.edu/course/3/3.11/www/modules/ss.pdf>.
5. Stress curves: <https://www.youtube.com/watch?v=f08Y39UiC-o>.
6. . Acoustics: <https://www.youtube.com/watch?v=fHBPvMDFyO8>.
7. INTRO – Fundamentals of Acoustics” (Lecture 1, NPTEL-NOC, IIT Madras)  
<https://www.youtube.com/watch?pp=0gcJCfwAo7VqN5tD&v=rT9B44Q4Rko>.
8. . Fundamentals of Acoustics playlist (multiple lectures on acoustic wave behavior, sound propagation, etc.)  
<https://www.youtube.com/playlist?list=PLgMDNELGJ1CYWnDbcbVET5zCbN4>

- aLEbZQ.
9. Structural Health Monitoring of Composites (IIT Kanpur) – Full NPTEL Course:  
<https://nptel.ac.in/courses/112104160>.
  10. . Course Introduction – Structural Health Monitoring (IITM – NPTEL):  
<https://www.youtube.com/watch?v=It4aogUfQis>.
  11. Smart Structures (IIT Kharagpur) – Covers smart materials, actuators, SHM:  
[https://onlinecourses.nptel.ac.in/noc23\\_ae19/preview](https://onlinecourses.nptel.ac.in/noc23_ae19/preview).

#### Active Based Learning (Suggested Activities in Class)/Practical Based Learning

<http://nptel.ac.in>  
<https://swayam.gov.in>  
[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)  
<https://phet.colorado.edu>  
<https://www.myphysicslab.com>

#### Teaching Learning Process:

1. Chalk and talk	2. Short Animations and Videos
3. Experimental Learning	4. Active based Learning
5. Hybrid Learning	6. Simulations and Interactive Simulations
7. ICT Based Learning	8. Self Learning using AI Tools

#### Course Articulation Matrix of Physics for Sustainable Structural Systems

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

Academic Year: 2025-26	Semester: II	Scheme: P25
Course Title: <b>Introduction to AI and Applications</b>		
Course Code: <b>P25ETC103</b>	CIE Marks: 50	CIE Weightage: <b>50%</b>
Teaching hours/week (L:T:P: S): 3:0:0:0	SEE Marks: 50	SEE Weightage: <b>50%</b>
Credits: <b>3</b>		
<b>Course learning Objectives:</b>		
<ul style="list-style-type: none"> <li>• Able to understand the fundamental concepts, history, and types of Artificial Intelligence (AI).</li> <li>• Develop an understanding of prompt engineering techniques and their role in generative AI communication.</li> <li>• Able to apply the basic machine learning methods for regression, classification, and clustering.</li> <li>• Provide awareness of recent trends, ethical concerns, and industrial applications of AI, including robotics, drones, AIoT, and no-code/low-code AI platforms.</li> <li>• Explore real-world applications of AI across multiple domains such as healthcare, finance, retail, agriculture, and education.</li> </ul>		
<b>UNIT 1</b>		<b>Hours:08</b>
<p><b>Introduction to Artificial Intelligence:</b> Artificial Intelligence, How Does AI Work?, Advantages and Disadvantages of Artificial Intelligence, History of Artificial Intelligence, Types of Artificial Intelligence, Weak AI, Strong AI, Reactive Machines, Limited Memory, Theory of Mind, Self-Awareness, Is Artificial Intelligence Same as Augmented Intelligence and Cognitive Computing, Machine Learning and Deep Learning.</p> <p><b>Machine Intelligence:</b> Defining Intelligence, Components of Intelligence, Differences Between Human and Machine Intelligence, Agent and Environment, Search, Uninformed Search Algorithms, Informed Search Algorithms: Pure Heuristic Search, Best-First Search Algorithm (Greedy Search).</p> <p><b>Knowledge Representation:</b> Introduction, Knowledge Representation, Knowledge-Based Agent, Types of Knowledge.</p>		
<b>Textbook Map:</b>		
<b>Textbook 1: Chapter 1 (1.1-1.5), Chapter 3 (3.1-3.7.2), Chapter 4 (4.1-4.4)</b>		
<b>UNIT 2</b>		<b>Hours: 08</b>
<p><b>Introduction to Prompt Engineering,</b> Introduction to Prompt Engineering, The Evolution of Prompt Engineering, Types of Prompts, How Does Prompt Engineering Work?, Comprehending Prompt Engineering's Function in Communication, The Advantages of Prompt Engineering, The Future of LLM Communication.</p> <p><b>Prompt Engineering Techniques for ChatGPT,</b> Introduction to Prompt Engineering Techniques, Instructions Prompt Technique, Zero, One, and Few Shot Prompting, Self-Consistency Prompt.</p> <p><b>Prompts for Creative Thinking:</b> Introduction, Unlocking Imagination and Innovation.</p> <p><b>Prompts for Effective Writing:</b> Introduction, Igniting the Writing Process with Prompts.</p>		

<b>Textbook Map:</b> <b>Textbook 2: Chapters 1,3,4 &amp; 5</b>				
<b>UNIT 3</b>			<b>Hours: 08</b>	
<b>Machine Learning:</b> Techniques in AI, Machine Learning Model, Regression Analysis in Machine Learning, Classification Techniques, Clustering Techniques, Naïve Bayes Classification, Neural Network, Support Vector Machine (SVM).				
<b>Textbook Map:</b> <b>Textbook 1: Chapter 2 (2.1-2.8)</b>				
<b>UNIT 4</b>			<b>Hours: 08</b>	
<b>Trends in AI:</b> AI and Ethical Concerns, AI as a Service (AiaaS), Recent trends in AI, Expert System, Internet of Things, Artificial Intelligence of Things (AioT).				
<b>Textbook Map:</b> <b>Textbook 1: Chapter 8 (8.1, 8.2, 8.4), Chapter 9 (9.1- 9.3)</b>				
<b>UNIT 5</b>			<b>Hours: 08</b>	
Robotics, Robotics-an Application of AI, Drones Using AI, No Code AI, Low Code AI. <b>Industrial Applications of AI:</b> Application of AI in Healthcare, Application of AI in Finance, Application of AI in Retail, Application of AI in Agriculture, Application of AI in Education, Application of AI in Transportation, AI in Experimentation and Multi-disciplinary research.				
<b>Text book Map:</b> <b>Textbook 1: Chapter 8 (8.3), Chapter 1 (1.7, 1.8, 1.10, 1.11)</b> <b>Textbook 3: Chapter 3, Chapter 5 (5.1)</b>				
<b>Teaching Learning Process:</b> Chalk and Board, PPT				
<b>Course Outcomes: At the end of the course students should be able to:</b>				
CO1: Explain the concepts and types of artificial intelligence. CO2: Make use of prompt engineering techniques to interact with generative AI tools. CO3: Illustrate basic machine learning methods for regression, classification and clustering. CO4: Outline recent trends in artificial intelligence and machine learning. CO5: Identify real-world applications across different disciplines.				
<b>Suggested Learning Resources:</b>				
<b>Textbooks:</b>				
Sl No	Title	Author	Year & Edition	Publisher
1	Artificial Intelligence: Beyond Classical AI	Reema Thareja,	2023	Pearson Education
2	Prompt Engineering: Empowering Communication	Ajantha Devi Vairamani and Anand Nayyar,	2024	CRC Press, Taylor & Francis Group
3	“AI for Everyone – A Beginner’s Handbook for Artificial Intelligence”,	Saptarsi Goswami, Amit Kumar Das and Amlan Chakrabarti,	2024	Pearson

Reference Books:													
1.	Artificial Intelligence: A Modern Approach	Stuart Russell and Peter Norvig	2023, 4 <sup>th</sup> Edition	Pearson Education,									
2.	Artificial Intelligence,	Elaine Rich, Kevin Knight, and Shivashankar B. Nair		McGraw Hill Education.									
3.	Prompt Engineering for Generative AI	Tom Taulli		O'Reilly Media,									
4.	Artificial Intelligence: Making A System Intelligent	Nilakshi Jain	1 <sup>st</sup> Edition	Wiley.									
Web links and Video Lectures (e-resources)													
01. Elements of AI – <a href="https://www.elementsofai.com">https://www.elementsofai.com</a> 02. CS50's Introduction to Artificial Intelligence with Python – Harvard <a href="https://cs50.harvard.edu/ai/">https://cs50.harvard.edu/ai/</a> 03. Google Machine Learning Crash Course – <a href="https://developers.google.com/machine-learning/crash-course">https://developers.google.com/machine-learning/crash-course</a> 04. Learn Prompting (Open-Source Guide) – <a href="https://learnprompting.org">https://learnprompting.org</a> 05. Google AI – Learn with Google AI <a href="https://ai.google/education/">https://ai.google/education/</a> 06. Coursera – Machine Learning by Andrew Ng (Stanford University) <a href="https://www.coursera.org/learn/machine-learning">https://www.coursera.org/learn/machine-learning</a> 07. OpenAI Prompt Engineering Guide (for ChatGPT) <a href="https://platform.openai.com/docs/guides/gpt-best-practices">https://platform.openai.com/docs/guides/gpt-best-practices</a> 08. Prompt Engineering for Developers – DeepLearning.AI + OpenAI <a href="https://www.deeplearning.ai/short-courses/chatgpt-prompt-engineering-for-developers/">https://www.deeplearning.ai/short-courses/chatgpt-prompt-engineering-for-developers/</a> 09. Ethics in AI – Google Responsible AI Practices <a href="https://ai.google/responsibilities/responsible-ai-practices/">https://ai.google/responsibilities/responsible-ai-practices/</a> 10. Google Teachable Machine (Train AI models visually without code) <a href="https://teachablemachine.withgoogle.com">https://teachablemachine.withgoogle.com</a>													
Active Based Learning (Suggested Activity in Class)/Practical based Learning													
The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes. <ul style="list-style-type: none"> <li>- Flipped Classroom</li> <li>- Problem-Based Learning (PBL)</li> <li>- Case-Based Teaching</li> <li>- Simulation and Virtual Labs</li> <li>- ICT-Enabled Teaching</li> <li>- Tool Demonstration</li> </ul>													
CO-PO Mapping													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2

CO1	2	1	-	-	1	2	-	-	1	-	1	-	1
CO2	1	2	2	2	2	2	3	2	2	-	1	2	2
CO3	2	3	1	1	2	2	2	-	-	-	2	2	2
CO4	2	-	-	1	2	1	1	-	-	-	1	1	1
CO5	2	2	2	2	2	2	2	1	1	2	2	1	1

<b>Academic Year: 2025-26</b>	<b>Semester: II</b>	<b>Scheme: P25</b>
<b>Course Title: Introduction to Electrical Engineering</b>		
<b>Course Code: P25ESC2042</b>	<b>CIE Marks:50</b>	<b>CIE Weightage:50%</b>
<b>Teaching hours/week (L:T:P): 3:0:0</b>	<b>SEE Marks:50</b>	<b>SEE Weightage:50%</b>
<b>Teaching hours of Pedagogy:40</b>	<b>Exam Hours: 3 Hours</b>	
<b>Credits: 3</b>		
<b>Course learning Objectives:</b>		
<ul style="list-style-type: none"> <li>• Explain the generation of power and the laws used in DC circuits.</li> <li>• Analyze single-phase and three-phase circuits.</li> <li>• Describe the construction, operation and applications of DC machines.</li> <li>• Describe the construction, operation and applications of transformers and induction motors.</li> <li>• Explain electricity billing and safety measures</li> </ul>		
<b>Unit 1</b>		<b>8 Hours</b>
<b>Power Generation:</b> Conventional and nonconventional energy sources. Single-line diagram of power supply system showing power station, transmission system and distribution system. Definition of power grid.		
<b>DC circuits:</b> Ohm's law and Kirchoff's laws, analysis of series, parallel and series-parallel circuits. Power and energy. Problems.		
<b>Unit 2</b>		<b>8 Hours</b>
<b>Single-Phase Circuits:</b> Generation of single-phase system. Equation of AC voltage and current, average value, RMS value, form factor, peak factor and their relation [No derivations]. Voltage and current relationships in R, L and C circuits, concept of power, reactive power, apparent power and power factor, analysis of R-L, R-C and R-L-C series circuits, parallel circuits, illustrative examples.		
<b>Three-Phase Circuits:</b> Generation of three-phase systems, star and delta (mesh) connections, relation between phase and line values of voltages and of currents of star and delta connections. Definition of balanced and unbalanced source and load. Power, reactive power and power factor. Problems with balanced loads.		
<b>Unit 3</b>		<b>8 Hours</b>
<b>DC Generator:</b> Principle of operation, constructional details, induced emf expression, types of generators. Relation between induced emf and terminal voltage. Simple problems.		
<b>DC Motor:</b> Principle of operation, back emf and its significance. Torque equation, types of motors, characteristics and speed control of DC shunt motor. Applications of DC motors. Simple problems.		
<b>Unit 4</b>		<b>8 Hours</b>
<b>Transformers:</b> Introduction to transformers, necessity of transformer, principles of operation, constructional features of single-phase transformers. EMF equation, losses, variation of losses with respect to load. Calculation of efficiency at different loads.		
<b>Three-phase induction Motors:</b> Definition of rotating magnetic field (without derivation), Principle of operation. Constructional features of squirrel cage type and wound rotor type induction motor. Slip and its significance, problems. Applications.		
<b>Unit 5</b>		<b>8 Hours</b>
<b>Domestic Wiring:</b> Two-way and three-way control of loads.		

**Electricity Bill:** Definition of “unit” used for consumption of electrical energy, power rating of common household appliances. Two-part electricity tariff.

**Equipment Safety measures:** Working principle of fuse and miniature circuit breaker (MCB), merits and demerits.

**Personal safety measures:** Electric shock, safety precautions to avoid shock. Earthing and types: Plate earthing and pipe earthing.

**Suggested Learning Resources:**

**Textbooks:**

1	B.L. Theraja	A textbook of Electrical Technology	S Chand and Company	Volume-1 Reprint Edition 2014
2	V. K. Mehta, Rohit Mehta	Principles of Electrical Engineering & Electronics	S. Chand and Company Publications,	2 <sup>nd</sup> edition, 2015

**Reference Books:**

1.	D. P. Kothari and I. J. Nagrath	Basic Electrical Engineering	McGraw Hill	4 <sup>th</sup> edition, 2019
2	Rajendra Prasad	Fundamentals of Electrical Engineering	PHI	3 <sup>rd</sup> edition, 2014
3	E. Hughes	Electrical Technology	Pearson	12 <sup>th</sup> Edition, 2016
4	K. Vijayarekha	Basic Electrical and Electronics Engineering	Cengage	Reprint 2023
5	Harish C Rai	Handbook of Electrical Engineering formulae	CBS Publications	2018

**Course Outcomes:** At the end of the course students should be able to;

**CO1:** Analyse the single-line power supply system and compare conventional and non-conventional energy sources based on generation and distribution.

**CO2:** Apply AC circuit concepts to determine current, voltage, and power in single-phase and three-phase systems under different load conditions.

**CO3:** Analyze the working principles and performance characteristics of DC generators and motors for various applications.

**CO4:** Apply the principles of operation of transformers and three-phase induction motors to evaluate their performance and applications.

**CO5:** Analyze domestic electrical wiring systems and safety measures to ensure safe and efficient utilization of electrical energy.

**COURSE ARTICULATION MATRIX [CAM]**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2					1						
CO2	3	3											
CO3	3	3											
CO4	3	3											
CO5	2	3				1	1	1					

**EXPECTED ATTAINMENT TARGET OF EACH PO'S**

%													
	1.	Level 3 is placed on the “apply or analyze or understand or design” level, which corresponds to 50% of the total distribution.											
	2.	Level 2 is placed on the “apply or analyze or understand or design” level, which corresponds to 33% of the total distribution.											
	3.	Level 1 is placed on the “apply or analyze or understand or design” level, which corresponds to 17% of the total distribution.											
<b>Web links and Video Lectures (e-resources)</b>													
<a href="http://www.nptel.ac.in">www.nptel.ac.in</a>													
(1) Principle of Electrical Sciences, Prof Sanjay Agrawal, Indira Gandhi National Open University.													
(2) Electricity and Electrical Wiring, Dr. Antara Mahanta Barua, Krishna Kanta Handiqui State Open University, Guwahati.													
<b>Teaching-Learning Process (Innovative Delivery Methods):</b>													
The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.													
1. Technology Integration, 2. Collaborative Learning, 3. Flipped Classroom, 4. Visual Based Learning													

Academic Year:2025-26	Semester: II	Scheme: P25
Course Title: Engineering Mechanics		
Course Code: P25PSC2051	CIE Marks: 50	CIE Weightage:50
Teaching hours/week (L:T:P): 3:0:0	SEE Marks: 100	SEE Weightage: 50
Teaching hours of Pedagogy: 40 Hours	Exam Hours: 03	
Credits: 03		
Prerequisite:		
<ul style="list-style-type: none"> <li>• <b>Basic concepts of forces</b> like gravity, friction, tension, normal force.</li> <li>• Laws of motion, inertia, force, momentum, energy, and work.</li> <li>• Units and dimensions (SI units, conversions), Introduction to statics and dynamics.</li> <li>• Basic knowledge of Mathematics like Algebra, Trigonometry, Geometry &amp; Calculus (differentiation and integration, understanding rates of change, areas under curves)</li> </ul>		
Course Learning Objectives: This course will enable the students to,		
<ul style="list-style-type: none"> <li>• To develop students' ability to analyze the problems involving forces, moments with their applications.</li> <li>• To analyse the member forces in trusses.</li> <li>• To make students to learn the effect of friction on different planes.</li> <li>• To develop the student's ability to find out the centre of gravity and moment of inertia and their applications.</li> <li>• To make the students learn about kinematics and kinetics and their applications.</li> </ul>		
<b>Unit 1: Resultant of coplanar force system</b>		<b>Hours: 8</b>
<b>Resultant of coplanar force system:</b> 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.		
Self-Study Content: Application of triangle and polygon Law, vector method of resolution and Composition of forces.		
<b>Unit 2: Equilibrium of coplanar force system</b>		<b>Hours: 8</b>
<b>Equilibrium of coplanar force system:</b> 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.		
Self-Study Content: Numerical problems on support reaction of beams loaded with trapezoidal loads, Support reactions for Compound beams.		
<b>Unit 3: Analysis of Trusses and Friction</b>		<b>Hours: 8</b>
<b>Analysis of Trusses:</b> Introduction, Classification of trusses, analysis of plane perfect trusses by the method of joints and method of sections, Numerical examples.		

<b>Friction:</b> Introduction, laws of Coulomb friction, equilibrium of blocks on horizontal plane, equilibrium of blocks on inclined plane, ladder friction, wedge friction Numerical examples.			
Self-Study Content: Wedge friction – numerical problems.			
<b>Unit 4: Centroid &amp; Moment of inertia of Plane areas</b>			<b>Hours: 8</b>
<b>Centroid of Plane areas:</b> 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.			
<b>Moment of inertia of plane areas:</b> 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.			
Self-Study Content: Determining Centroid for Composite Lamina with openings. Determining moment of Inertia of Composite sections with reference to given axis.			
<b>Unit 5: Dynamics</b>			<b>Hours: 8</b>
<b>Kinematics:</b> Linear motion: Introduction, Displacement, speed, velocity, acceleration, acceleration due to gravity, Numerical examples on linear motion Projectiles: Introduction, numerical examples on projectiles.			
<b>Kinetics:</b> Introduction, D 'Alembert's principle of dynamic equilibrium and its application in-plane motion and connected bodies including pulleys, Numerical examples.			
Self-Study Content: Concept of motion with varying acceleration. Collision of elastic bodies			
<b>Course outcomes: On completion of this course, students are able to:</b>			
Cos	Course Outcomes with Action verbs for course topics	Bloom's Taxonomy Level	Level Indicator
CO1	Compute the resultant of a force system and resolution of a force	Applying	3
CO2	Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces	Applying	3
CO3	Analyse the frictional resistance offered by different planes	Analysing	4
CO4	Locate the centroid and compute the moment of inertia of sections	Applying	3
CO5	Analyze the bodies in motion	Analysing	4

<b>Suggested Learning Resources:</b>				
<b>Textbooks:</b>				
Sl. No.	Title	Author	Year & Edition	Publisher
1	Basic Civil Engineering and Engineering Mechanics	Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan	2015, 3 <sup>rd</sup> Edition	Laxmi Publications
2	Elements of Civil Engineering and Engineering Mechanics	Kolhapure B K	2018, 11 <sup>th</sup> Edition	Eastern Book Promoters Belgaum [EBPB]
<b>Reference Books:</b>				
1	Mechanics for Engineers: Statics and Dynamics	Beer F.P. and Johnston E. R	1987, 4 <sup>th</sup> Edition	McGraw Hill
2	Engineering Mechanics- Statics, Volume- I	Meriam J. L. and Kraige L. G	2008, 6 <sup>th</sup> Edition	Wiley publication
3	Engineering Mechanics- Statics and Dynamics	Irving H. Shames	2002, 4 <sup>th</sup> Edition	Prentice-Hall of India(PHI)
4	Engineering Mechanics: Principles of Statics and Dynamic	Hibbler R. C.	2017, 14 <sup>th</sup> Edition	Pearson Press, New Delhi
5	Engineering Mechanics	Timoshenko S, Young D. H., Rao J. V., Sukumar Patil	2017, 5 <sup>th</sup> Edition	McGraw Hill Publisher
6	Engineering Mechanics	Reddy Vijaykumar K and Suresh Kumar K	2013, 3 <sup>rd</sup> Edition	BS Publications
7	Engineering Mechanics and Applied Mechanics	J K Gupta and S K Gupt	2021, 1 <sup>st</sup> Edition	Cengage learning

<b>Web Links and Video Lectures ( e-resources):</b>
1. Introduction to Engineering mechanics Lec 01: <a href="https://youtu.be/nGfVTNfNwnk?si=UIRMohvJWI-M4V8g">https://youtu.be/nGfVTNfNwnk?si=UIRMohvJWI-M4V8g</a>
2. Introduction to Engineering mechanics Lec 02: <a href="https://youtu.be/nkg7VNW9UCc?si=NpnirNSGfyMcBg9m">https://youtu.be/nkg7VNW9UCc?si=NpnirNSGfyMcBg9m</a>
3. Friction: <a href="https://youtu.be/VQRcChR9IkU?si=A9e2M5IB89FljyDI">https://youtu.be/VQRcChR9IkU?si=A9e2M5IB89FljyDI</a>
4. Beams: <a href="https://youtu.be/z95UW4wwzSc?si=DWuvBVyylSYWpp5C">https://youtu.be/z95UW4wwzSc?si=DWuvBVyylSYWpp5C</a>

5. Trusses: <a href="https://www.youtube.com/watch?v=lheoBL2QaqU&amp;list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&amp;index=7">https://www.youtube.com/watch?v=lheoBL2QaqU&amp;list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&amp;index=7</a>
6. D'Alembert's Principle: <a href="https://www.youtube.com/watch?v=atoP5_DeTPE">https://www.youtube.com/watch?v=atoP5_DeTPE</a>
7. Statics and Dynamics in Engineering Mechanics: <a href="https://www.youtube.com/watch?v=x1ef048b3CE">https://www.youtube.com/watch?v=x1ef048b3CE</a>
8. Solving Forces in Equilibrium: <a href="https://www.youtube.com/watch?v=l_Nck-X49qc">https://www.youtube.com/watch?v=l_Nck-X49qc</a>
9. Static Friction and Kinetic Friction Physics Problems With Free Body Diagrams: <a href="https://www.youtube.com/watch?v=RIBeeW1DSZg">https://www.youtube.com/watch?v=RIBeeW1DSZg</a>
10. Centre of Gravity - Definition, Examples, Experiment: <a href="https://www.youtube.com/watch?v=R8wKV0UQtlo">https://www.youtube.com/watch?v=R8wKV0UQtlo</a>
11. Engineering Mechanics - Center of Gravity and Centroid: <a href="https://www.youtube.com/watch?v=0RZHHgL8m_A">https://www.youtube.com/watch?v=0RZHHgL8m_A</a>
12. Understanding the Area Moment of Inertia: <a href="https://www.youtube.com/watch?v=Bl5KnQOWkY">https://www.youtube.com/watch?v=Bl5KnQOWkY</a>

**Active Based Learning (Suggested Activity in Class)/ Practical Based Learning:**

<ol style="list-style-type: none"> <li>1. Flip Class</li> <li>2. Seminar/Poster Presentation</li> <li>3. Individual role play/ Team Demonstration/ collaborative activity</li> <li>4. Case study</li> <li>5. Learn by Doing</li> </ol>
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**COURSE ARTICULATION MATRIX  
(ENGINEERING MECHANICS - P25PSC2051)**

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PSO 1	PSO 2	PSO 3
CO 1	2	3												
CO 2	2	3												
CO 3	2	3												
CO 4	2	3												
CO 5	2	3												
3-High, 2 Medium, 1-Slight														

Academic Year: 2025-26	Semester: II	Scheme: P25
Course Title: Mechanics and Material Laboratory		
Course Code: P25PSCL2061	CIE Marks: 50	CIE Weightage: 50%
Teaching hours/week (L: T:P): 0:0:2	SEE Marks: 50	SEE Weightage: 50%
Teaching hours: 30 Hours	Exam Hours: 03	
Credits: 01		
Prerequisite:		
Nil		
Course Learning Objectives: This course will enable the students to		
CLO1: To analyse the equilibrium of forces, verification of Lami's theorem and Varignons theorem.		
CLO2: To understand the properties of construction materials like cement, soil, fine aggregate and coarse aggregate		
CLO3: To know the field tests on cement, and to understand the different gradation of soil.		
<b>PART – A: COVENTIONAL EXPERIMENTS</b>		
<ol style="list-style-type: none"> <li>1. Verification of Lami's Theorem.</li> <li>2. Equilibrium of concurrent forces.</li> <li>3. Parallel force system- Simply supported beam.</li> <li>4. Verification of Varignon's theorem.</li> <li>5. Specific Gravity of <ol style="list-style-type: none"> <li>a) Fine aggregates.</li> <li>b) Coarse aggregates.</li> <li>c) Cement.</li> <li>d) Soil.</li> </ol> </li> <li>6. Sieve analysis of soil-Graphical representation of the gradation curve, and Visual identification of building materials: Bricks, Stones, Tiles, M-Sand, Bitumen, Fly-Ash, GGBS, Steel Bars of Various Sizes.</li> </ol>		
<b>PART – B: TYPICAL OPEN-ENDED EXPERIMENTS</b>		
Open-ended experiments are a type of laboratory activity where the outcome is not predetermined, and students are given the freedom to explore, design, and conduct the experiment based on the problem statements as per the concepts defined by the course coordinator. It encourages creativity, critical thinking, and inquiry-based learning.		
<ol style="list-style-type: none"> <li>1. Reactions.</li> <li>2. Field tests on cement.</li> <li>3. Particle size distribution.</li> <li>4. Gap graded.</li> <li>5. Uniformly graded.</li> </ol>		

6. Well graded.			
<b>Course outcomes:</b> On completion of this course, students are able to;			
COs	Course Outcomes with Action verbs for course topics	Bloom's Taxonomy Level	Level Indicator
CO1	Analyse coplanar force systems by analytical and graphical methods and verifying Lami's theorem.	Analysing	L4
CO2	Compute support reactions in simply supported beams experimentally and analytically.	Evaluating	L5
CO3	Identify and understand the properties of various construction materials.	Applying	L3

<b>Suggested Learning Resources:</b>				
<b>Textbooks:</b>				
Sl. No.	Title	Author	Year & Edition	Publisher
1	Engineering Mechanics	Ramamrutham.S	2013	Dhanpat Rai Books, ISBN: 9789352164271
2	Basic Civil Engineering and Engineering Mechanics	Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan	2015, Third Edition	Laxmi Publications, ISBN: 9789380856674
3	Soil Mechanics and foundation Engineering	B C Punmia, Ashok Kumar Jain, Arun Kumar Jain	18 <sup>th</sup> edition, 2023	Laxmi Publications New Delhi.
4	Concrete Manual	M. L. Gambhir	---	Dhanpat Rai & sons New – Delhi
<b>Reference Books:</b>				
1	Engineering Mechanics- Statics, Vol. I	Meriam J. L. and Kraige L. G	2008, 6 <sup>th</sup> Edition	Wiley Publication
2	Strength of Materials	Rattan S. S.	2017, Third Edition	McGraw Hill Education; New Delhi
3	Strength of Materials	Bansal R K	2023, 4 <sup>th</sup> Edition	Laxmi Publications
4	IS 4031 (Part 11):1988 – Specific gravity test for hydraulic cement.			

5	IS 383:1970 – Specification for coarse and fine aggregates from natural sources for concrete
6	IS 2386(Part 3):1963 Methods of test for aggregates for concrete: Part 3 Specific gravity, density, voids, absorption and bulking.
7	IS 2720 (Part 3/Sec 1):1980 – Determination of specific gravity of soil.

**Web Links and Video Lectures (e-resources):**

1. Grain Size Analysis:  
<https://youtu.be/VoY5Ms8DpW0?list=PL3MO67NH2XxKxWtYte3GeJJN8LNQWcJqP>
2. Fundamentals of Engineering Mechanics: <https://nptel.ac.in/courses/112103109>
3. Geotechnical Engineering Laboratory, Specific Gravity and Field Density:  
<https://youtu.be/RUYkn1kDvol?list=PL3MO67NH2XxKxWtYte3GeJJN8LNQWcJqP>

**Active Based Learning (Suggested Activity in Class)/ Practical Based Learning:**

1. Flip Class
2. Seminar/Poster Presentation
3. Individual role play/ Team Demonstration/ collaborative activity
4. Case study
5. Learn by Doing

COURSE ARTICULATION MATRIX (MECHANICS AND MATERIAL LABORATORY - P25PSCL2061)														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2											2		
CO2	1	2											2	
CO3	2											2		
3-High, 2 Medium, 1-Slight														

Academic Year: 2025-26		
Course Title: Physics for Sustainable Structural Systems Laboratory		
Semester: II		
Course Code:	P25PHCVL207	Credit: 01
Teaching hours/week (L:T:P):	0:0:2	CIE Marks:50
Teaching hours of Pedagogy:	10-12 Lab slots	SEE Marks:50
<b>Course Learning Objectives:</b>		
<ul style="list-style-type: none"> <li>• Identify the principles of oscillations, waves and acoustics through experiments relevant to sustainable structural systems.</li> <li>• Setup or construct the circuit to perform experiments related to Engineering applications.</li> <li>• To develop the skills in using experimental techniques, measurement tools and simulation software for analysing structural responses and material behaviour.</li> </ul>		
<b>PART–A: Fixed Set of Experiments</b>		<b>24 Hours</b>
<ol style="list-style-type: none"> <li>1. Study of Forced Mechanical <b>Oscillations</b> and <b>Resonance</b>.</li> <li>2. Study of the frequency response of Series &amp; Parallel <b>LCR circuits</b>.</li> <li>3. Determination of effective <b>spring constant</b> of the given springs in series and parallel combinations.</li> <li>4. <b>Kundt's Dust Tube</b> – Determination of Velocity of Sound.</li> <li>5. Verification of <b>Inverse Square Law</b> of Intensity of Light.</li> <li>6. Study on types of damping (<b>Pendulum</b> and Damper / PHET).</li> <li>7. Interpretation of graphs and images using <b>XRD</b> and <b>SEM</b>.</li> <li>8. Determination of wavelength of Ultrasonic using <b>Ultrasonic Interferometer</b>.</li> <li>9. Determination of <b>Young's Modulus</b> of the material of the given bar using Single Cantilever.</li> <li>10. <b>STEP</b> Interactive Physical Simulations. (Relevant to Theory part).</li> <li>11. <b>PHET</b> Interactive Simulations (Relevant to Theory part).</li> <li>12. Simple <b>case study</b> on acoustics (Auditorium, Cinema Hall, Etc).</li> <li>13. Study of motion using <b>spread Sheets</b>.</li> <li>14. Data Analysis using <b>Spread Sheets</b>.</li> </ol>		

**Course Outcomes:** On completion of this course, students should be able to:

**CO1:** Apply the fundamental concepts of physics by performing laboratory experiments to determine mechanical and material properties relevant to civil engineering applications.

**CO2:** Analyze and interpret experimental data, calculate errors and compare results with theoretical predictions to validate physical laws and engineering applications

**CO3:** Demonstrate the use of simulation tools such as PHET, Spreadsheets and Tracker to model, visualize and investigate physical phenomena in the field of civil engineering applications.

**Suggested Learning Resources:**

**Textbooks:**

	Title	Author	Year & Edition	Publisher
1.	Engineering Physics	M N Avadhanulu & P G Kshirsagar	Latest Edition	S Chand & Co., New Delhi
2.	Engineering Physics with Laboratory Manual	H K Malik & A K Singh	Latest Edition	Mc Graw-Hill Education

**Reference Books:**

1.	Building Acoustics	Tor Erik Vigran	1st Edition, 2008	CRC Press
2.	Non-Destructive Testing of Materials	Barry Hull & Vernon John	2nd Edition, 2003	Springer
3.	X-Ray Diffraction	B D Cullity & S R Stock	3rd Edition, 2001	Pearson Education
4.	Spreadsheet Tools for Engineers – Excel 2016	Byron S. Gottfried	4th Edition, 2017	Mc Graw-Hill Education
5.	Spreadsheet Applications in Science Education	Thomas J Quirk	2nd Edition, 2015	Springer
6.	PHET Interactive Simulations for Science and Math (Online Open Resource)	University of Colorado, Boulder	Continuous Update	Open Educational Resource (OER)

**Course Articulation Matrix of Physics for Sustainable Structural Systems Laboratory**

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	2	3	-	2	-	-	-	-	2	-	-
CO3	1	2	-	-	3	-	-	-	1	-	2

<b>Course Title:</b>	Communicative English – II (Common to all branches)		
<b>Course Code:</b>	P25ENG208	<b>CIE Marks</b>	50
	Theory	<b>SEE Marks</b>	50
		<b>Total Marks</b>	100
<b>Teaching Hours/Week (L: T:P:S)</b>	0:2:0:2	<b>Exam Hours</b>	02 Theory
<b>Total Hours of Pedagogy</b>	30 hours	<b>Credits</b>	01
<b>Module-1: Listening Skills II</b>			<b>2 Hours</b>
Levels of listening, Active listening, Techniques of listening. Activity: Listening for main ideas and listening for specific information			
<b>Speaking Skills II</b>			<b>6 Hours</b>
Language of discussion – Giving opinion, agreeing / disagreeing, asking questions, making suggestions. Sentence stress – content and structure words, Speaking situations, Intonations and Summarizing skills			
<b>Module-2: Reading Skills II</b>			<b>2 Hours</b>
Guessing meaning from the context, understanding graphical information, Summarizing. Activity: Book review			
<b>Writing Skills II</b>			<b>4 Hours</b>
Linkers and connectives, Sentence and paragraph transformation, Mind mapping techniques, Letter writing, Essay writing			
<b>Module-3: Email Etiquette</b>			<b>4 Hours</b>
Parts of an email, Writing an effective subject line, email language and tone. Activity: Email writing practice - Scenario based emails			
<b>Group Presentations</b>			<b>2 Hours</b>
Group presentations by the students.			
<b>Module-4 Goal Setting</b>			<b>2 Hours</b>
Defining goals, types of goals, Establishing SMART goals, Steps in setting goals, Goal setting activity			
<b>Individual Presentations</b>			<b>4 Hours</b>
Individual presentation by the students			
<b>Module-5 Teamwork</b>			<b>4 Hours</b>
Defining teams, Team vs. Group, Benefits and challenges of working in teams, Stages of team building, building effective teams, Case studies on teamwork			
Course Outcomes: On completion of this course, students will be able to, CO1: Develop skills in listening, speaking, reading, and writing for effective communication. CO2: Write effective emails, essays, and use proper email etiquette including subject lines, language, and tone. CO3: Define goals (individual and team), establish SMART goals, and work effectively in teams including stages of team building and benefits/challenges of teamwork. CO4: Develop skills for individual and group presentations			

**Textbooks and Reference Books:**

1. Communication Skills by Sanjay Kumar and Pushpa Lata, Oxford University Press - 2015.
2. Everyday Dialogues in English by Robert J. Dixson, Prentice-Hall of India Ltd., 2006.
3. Developing Communication Skills by Krishna Mohan & Meera Banerjee (Macmillan)
4. The Oxford Guide to Writing and Speaking, John Seely, Oxford.
5. English Language Communication Skills - Lab Manual cum Workbook by Rajesh Kumar Singh, Cengage learning India Pvt Limited – 2018
6. The 7 habits of highly effective people by Stephen R Covey, Simon & Schuster – 2020.
7. You Are the Team: 6 Simple Ways Teammates Can Go from Good to Great by Michael G. Rogers.

#### CO – PO – PSO Matrix

CO	PO											PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11		PSO1	PSO2	PSO3
CO1					1				3		1				
CO2					2				3						
CO3								3	1		2				
CO4					2			3	1						
CO															

<b>Academic Year:</b> 2025-2026	<b>Semester:</b> II	<b>Scheme:</b> P25
<b>Course Title:</b> Interdisciplinary Project Based Learning		
<b>Course Code:</b> P25IDT209	<b>CIE Marks:</b> 50	<b>CIE Weightage:</b> 50
<b>Teaching hours/week (L: T:P)</b> 0:0:2	<b>SEE Marks:</b> 50	<b>SEE Weightage:</b> 50
<b>Teaching hours of Pedagogy:</b> -	<b>Exam Hours:</b> 02	
<b>Credits:</b> 01		
<b>Prerequisite:</b>		
<ul style="list-style-type: none"> <li>• Basic understanding of design thinking principles</li> <li>• Open-mindedness to diverse perspectives</li> <li>• Effective communication, problem-solving skills and team collaboration</li> </ul>		
<b>Course learning Objectives:</b>		
After learning this course, the student will be able to		
<ul style="list-style-type: none"> <li>• Design effective questionnaires and feedback forms for usability and experience evaluation.</li> <li>• Create an Empathy Map to better understand the user's mindset, needs, and experiences.</li> <li>• Understand the basics of early-stage business planning for social innovation projects.</li> <li>• Present a fully functional Proof of Concept (PoC) to evaluators and stakeholders.</li> </ul>		
<b>Course content</b>		
<b>Week – 1 &amp; 2: Introduction and first Semester Recap-</b> Project-based learning & interdisciplinarity, User Testing Preparation & Execution - Interview Techniques and Questionnaire design, Field Visit.		
<b>Week – 3, 4 &amp; 5: Analysis, Feedback &amp; Prioritization-</b> Feedback analysis, Customer Journey Mapping, Stakeholder Mapping and Empathy map.		
<b>Week – 6, 7 &amp; 8: Iteration &amp; Refinement-</b> Feature improvement using SCAMPER technique, Iteration Sprint 1, Iteration Sprint 2		
<b>Week – 9, 10 &amp;11: Presentation &amp; Future Planning-</b> Business Model Canvas, Pitch deck creation		
<b>Week - 12, 13 &amp; 14: Final demo and social pitch -</b> Prototype building, Hackathon and Demo Day		
<b>Course Outcomes:</b> At the end of the course students should be able to:		
CO1: Analyse user feedback using empathy mapping to validate and refine problem–solution fit.		
CO2: Develop the solution through iterative sprints based on validated user insights.		
CO3: Develop a business plan and pitch deck articulating value proposition, feasibility, sustainability, and implementation strategy.		
CO4: Demonstrate a Proof of Concept (PoC) and present a future roadmap by integrating technical, user, and business learnings during Demo Day.		

Course Articulation Matrix																	
Course Outcomes		Program Outcomes												PSO			
		1	2	3	4	5	6	7	8	9	10	11	12	1	2		
CO1	Analyze user feedback using empathy mapping to validate and refine problem–solution fit.		3		3					2	2	2					
CO2	Develop the solution through iterative sprints based on validated user insights.			3	2	2					2					2	
CO3	Develop a business plan and pitch deck articulating value proposition, feasibility, sustainability, and implementation strategy.										2	3	3				
CO4	Demonstrate a Proof of Concept (PoC) and present a future roadmap by integrating technical, user, and business learnings during Demo Day.			3	2	2					2	3	2	2			

## ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ

Course Title:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Course Code:	P25KSK110	CIE Marks	100
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	-
		Total Marks	100
Teaching Hours/Week (L:T:P:S)	0:2:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	00
<b>Course Objectives: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:</b>			
<b>The course will enable the students,</b>			
೧. ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಾಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.			
೨. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.			
೩. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಾಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.			
೪. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.			
೫. ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.			
<b>ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process – General Instructions):</b>			
These are sample Strategies, which teacher can use to accelerate the attainment of the course outcomes.			
೧. ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಬೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧಾರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.			
೨. ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು - ಅಂದರೆ ಕವಿ-ಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಜಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು.			
೩. ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಬೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.			
<b>Module-1 ಕನ್ನಡ ಸಂಸ್ಕೃತಿ ಮತ್ತು ಭಾಷೆ ಕುರಿತಾದ ಲೇಖನಗಳು</b>		<b>(03 hours of pedagogy)</b>	
೧. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ - ಹಂಪ ನಾಗರಾಜಯ್ಯ			
೨. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ - ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ			
೩. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ			
<b>Module-2 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ</b>		<b>(03 hours of pedagogy)</b>	
೧. ವಚನಗಳು: ಬಸವಣ್ಣ, ಅಕ್ಕಮಹದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ.			
೨. ಕೀರ್ತನೆಗಳು: ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ - ಪುರಂದರದಾಸರು			
೩. ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ - ಕನಕದಾಸರು			
೪. ತತ್ವಪದಗಳು: ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಶರೀಫಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case			
<b>Module-3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ</b>		<b>(03 hours of pedagogy)</b>	
೧. ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗಿಂದ ಆಯ್ದು ಕೆಲವು ಭಾಗಗಳು			
೨. ಕುರುಡು ಕಾಂಚಾಣ: ದಾ.ರಾ. ಬೇಂದ್ರೆ			
೩. ಹೊಸಬಾಳಿನ ಗೀತೆ: ಕುವೆಂಪು			

<b>Module-4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ</b>	<b>(03 hours of pedagogy)</b>
೧. ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ: ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ ಎನ್ ಮೂರ್ತಿರಾವ್ ೨. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ: ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ	
<b>Module-5 ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ</b>	<b>(03 hours of pedagogy)</b>
೧. ಯುಗಾದಿ: ವಸುಧೇಂದ್ರ ೨. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ: ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	
<b>ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಪರಿಣಾಮಗಳು (Course Outcomes)</b>	
CO1: ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡಿರುತ್ತದೆ.	
CO2: ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.	
CO3: ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯು ಹೆಚ್ಚಾಗುತ್ತದೆ.	
CO4: ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕತೆ ಹೆಚ್ಚಾಗುತ್ತದೆ.	
CO4: ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.	
<b>Assessment Details: Only CIE will be conducted for this course.</b>	
<b>Continuous Internal Evaluation:</b>	
Three Tests will be conducted in the pattern (20+ 40 + 40) for 100 Marks. CIE methods / question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.	
<b>CIE methods / question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</b>	
<b>ಪಠ್ಯ ಪುಸ್ತಕ: University Prescribed Textbook</b>	
ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಡಾ. ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಎಲ್. ತಿಮ್ಮೇಶ, ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ	

## ಬಳಕೆ ಕನ್ನಡ - Balake Kannada (Kannada for Usage)

<b>Course Title:</b>	ಬಳಕೆ ಕನ್ನಡ		
<b>Course Code:</b>	P25KSK110	<b>CIE Marks</b>	<b>100</b>
<b>Course Type (Theory/Practical /Integrated)</b>	<b>Theory</b>	<b>SEE Marks</b>	-
		<b>Total Marks</b>	<b>100</b>
<b>Teaching Hours/Week (L:T:P:S)</b>	<b>0:2:0:0</b>	<b>Exam Hours</b>	<b>01 Theory</b>
<b>Total Hours of Pedagogy</b>	<b>15 hours</b>	<b>Credits</b>	<b>00</b>

**Course objectives:** ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು

The course 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 conversation.
5. To know about Karnataka state and its language, literature and General information about this state.

**ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process – General Instructions):**

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

೧. ಬಳಕೆ ಕನ್ನಡವನ್ನು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಬೋಧಿಸಲು ವಿಟಿಯು ಸೂಚಿಸಿರುವ ಪಠ್ಯಪುಸ್ತಕವನ್ನು ಉಪಯೋಗಿಸಬೇಕು.
೨. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಉತ್ತೇಜಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
೩. ಪ್ರತಿ ವಿದ್ಯಾರ್ಥಿ ಪುಸ್ತಕವನ್ನು ತರಗತಿಯಲ್ಲಿ ಬಳಸುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು ಮತ್ತು ಪ್ರತಿ ಪಾಠ ಮತ್ತು ಪ್ರವಚನಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪೂರಕ ಚಟುವಟಿಕೆಗಳಿಗೆ ತೊಡಗಿಸತಕ್ಕದ್ದು.
೪. ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನದ ಮುಖಾಂತರ ಇತ್ತೀಚೆಗೆ ಡಿಜಿಟಲೀಕರಣಗೊಂಡಿರುವ ಭಾಷೆ ಕಲಿಕೆಯ ವಿಧಾನಗಳನ್ನು ಪರಿಶೀಲಿಸಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕೈಗೊಳ್ಳುವುದು. ಇದರಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ತರಗತಿಯಲ್ಲಿ ಹೆಚ್ಚು ಏಕಾಗ್ರತೆಯಿಂದ ಪಾಠ ಕೇಳಲು ಮತ್ತು ಅಧ್ಯಯನದಲ್ಲಿ ತೊಡಗಲು ಅನುಕೂಲವಾಗುತ್ತದೆ.
೫. ಭಾಷಾಕಲಿಕೆಯ ಪ್ರಯೋಗಾಲಯದ ಮುಖಾಂತರ ಬಹುಬೇಗ ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕಲಿಯಲು ಅನುಕೂಲವಾಗುವಂತೆ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳನ್ನು ಮತ್ತು ಕ್ರಿಯಾ ಯೋಜನೆಗಳನ್ನು ರೂಪಿಸುವುದು.

**Module-1****(03 hours of pedagogy)**

1. Introduction, Necessity of learning a local language. Methods to learn the Kannada language.
2. Easy learning of a Kannada Language: A few tips. Hints for correct and polite conversation, Listening and Speaking Activities
3. ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ / ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು –Personal Pronouns, Possessive Forms, Interrogative words

**Module-2****(03 hours of pedagogy)**

೧. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು – Possessive forms of nouns, dubitive question and Relative nouns
೨. ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative and Colour Adjectives, Numerals
೩. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು – ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ – (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case

**Module-3****(03 hours of pedagogy)**

<p>೧. ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು - Dative Cases, and Numerals</p> <p>೨. ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal numerals and Plural markers</p> <p>೩. ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು - Defective / Negative Verbs and Colour Adjectives</p>
<p><b>Module-4</b> <b>(03 hours of pedagogy)</b></p>
<p>೧. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತ್ತು ಒತ್ತಾಯ ಅರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು Permission, Commands, encouraging and Urging words (Imperative words and sentences)</p> <p>೨. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication</p> <p>೩. “ಇರು ಮತ್ತು ಇರಲ್ಲ” ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು - Helping Verbs “iru and iralla”, Corresponding Future and Negation Verbs</p> <p>೪. ಹೋಲಿಕೆ (ತರತಮ), ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ - Comparative, Relationship, Identification and Negation Words</p>
<p><b>Module-5</b> <b>(03 hours of pedagogy)</b></p>
<p>೧. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು -Differint types of forms of Tense, Time and Verbs</p> <p>೨. ದ್, -ತ್, -ತು, -ಇತು, -ಆಗಿ, -ಅಲ್ಲ, -ಗ್, -ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of past, Future and Present Tense Sentences with Verb Forms</p> <p>೩. Kannada Vocabulary List: ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation</p>
<p><b>Course Outcomes (Course Skill Set):</b> ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು: At the end of the Couse, The Students will be able</p> <p><b>CO1:</b> To understand the necessity of learning of local language for comfortable life.</p> <p><b>CO2:</b> To Listen and understand the Kannada language properly.</p> <p><b>CO3:</b> To speak, read and write Kannada language as per requirement.</p> <p><b>CO4:</b> To communicate (converse) in Kannada language in their daily life with kannada speakers.</p> <p><b>CO5:</b> To speak in polite conservation.</p>
<p><b>Assessment Details: Only CIE will be conducted for this course.</b></p> <p><b>Continuous Internal Evaluation:</b> Three Tests will be conducted in the pattern (20+ 40 + 40) for 100 Marks. CIE methods / question paper is designed to attain the different levels of Bloom’s taxonomy as per the outcome defined for the course.</p> <p><b>CIE methods / question paper is designed to attain the different levels of Bloom’s taxonomy as per the outcome defined for the course.</b></p>
<p>ಕನ್ನಡ ಕಲಿಕೆಗಾಗಿ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ (Prescribed Textbook to Learn Kannada)</p> <p><b>ಪಠ್ಯ ಪುಸ್ತಕ (Text book):</b> ಬಳಕೆ ಕನ್ನಡ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ, ಪ್ರಕಟಣೆ: ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ</p>