VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI

Scheme of Teaching and Examinations (2026)

M.Tech., in Mechanical Engineering

(Specialization in ………………………………)

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

I SEMESTER (Common to all specialized programmes under one stream)

Sl. No	Course Type	Course Code	Course Title	Teaching & Learning Scheme					Examination					Credits
				CI		LI	TW & SL	Total Hours/Sem	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P							
1	MAT/PCC	1Mxx101						90	03	50	50	100	3
2	PCC	1Mxx102						90	03	50	50	100	3
3	PCC	1Mxx103						90	03	50	50	100	3
4	IPCC	1Mxx104x	Integrated Professional Core Course-I	40	0	28	52	120	03	50	50	100	4
5	PEC	1Mxx105x	Professional Elective Course-I					90	03	50	50	100	3
6	PEC	1Mxx106x	Professional Elective Course-II					90	03	50	50	100	3
7	PCCL	1MxxL107x	Professional Core Courses Labs			28	02	30	03	50	50	100	1
8	NCMC	1MRMI108	Research Methodology and IPR (**Online**)	Online courses (online.vtu.ac.in)									PP
			TOTAL							**350**	**350**	**700**	**20**

Professional Elective Courses (PECs):

Professional Elective Courses – PEC–I and PEC–II – are common to all branches of specialization within a particular Engineering stream. Students may choose the most appropriate elective based on their field of specialization and academic requirements. *Note: The number of courses listed under each PEC group may exceed four, depending on the specializations under one stream.*

Integrated Professional Core Courses (IPCC):

The 1Mxx104x Group comprises specialization-specific core courses that are integrated with a practical component, ensuring application-oriented learning aligned with industry and research needs. The number of courses in the group depends on the number of specializations offered under a particular engineering stream.

Integrated Professional Core Course (IPCC)		Professional Elective Courses-I	
Code	Title of the Course	Code	Title of the Course
1Mxxx104A		1Mxxx105A	
1Mxxx104B		1Mxxx105B	
1Mxxx104C		1Mxxx105C	
1Mxxx104D		1Mxxx105D	

Professional Elective Courses-II		Professional Core Courses Lab (PCCL)	
Code	Title of the Course	1MxxxL107A	
1Mxxx106A		1MxxxL107B	
1Mxxx106B		1MxxxL107C	
1Mxxx106C		1MxxxL107D	
1Mxxx106D		1MxxxL107E	

	Specialization in –(xxx)												
	II SEMESTER												
				Teaching & Learning Scheme					**Examination**				
Sl. No	**Course**	**Course Code**	**Course Title**	**L**	**T**	**P**	**TW & SL**	**Total Hours /Semester**	**Duration in hours**	**CIE Marks**	**SEE Marks**	**Total Marks**	**Credits**
1	PCC/IPCC	1Mxxx201						120	03	50	50	100	4
2	PCC	1Mxxx202						90	03	50	50	100	3
3	PCC	1Mxxx203						90	03	50	50	100	3
4	PCC	1Mxxx204						90	03	50	50	100	3
5	PEC	1Mxxx205x	Professional Elective Courses-III					90	03	50	50	100	3
6	PEC	1Mxxx206x	Professional Elective Course-IV					90	03	50	50	100	3
7	PCCL	1MxxxL207	Professional Core Course- Lab (AEC Lab)	0	00	28	02	30	03	50	50	100	1
8	PCC	1MxxxS208	Minor Project /Skill Development Project					60	03	50	50	100	2
							Total			400	400	800	22

About the Ability /Skill Development Project. Please see the pages 08 and 09

Professional Elective Courses (PECs)				
PEC-III			PEC-IV	
Code	Title of the Course		Code	Title of the Course
1Mxxx205A			1Mxxx206A	
1Mxxx205B			1Mxxx206B	
1Mxxx205C			1Mxxx206C	
1Mxxx205D			1Mxxx206D	

Overview of Courses, Credits, Projects, and Internships under VTU Curriculum

I.   Abbreviations used in the Scheme of Teaching and Examinations

Abbreviations	Expanded Form of the Abbreviations
AICTE	**All India Council of Technical Education**
NCrF	**National Credit Framework**
VTU	**Visvesvaraya Technological University**
AEC	Ability Enhancement Course
ASC	Applied Science Course
BSC	Basic Science Course
CIE	Continuous Internal Evaluation
CI	Classroom Instruction
CCA	Continuous Comprehensive Assessment
CGPA	Cumulative Grade Point Average
CUL	Cultural
COE	Centre for Online Education
HSMC	Humanities Studies and Management Course
IPCC	Integrated Professional Core Course
LI	Laboratory Instruction
L	Lecture
NCMC	Non-Credit Mandatory Course
NSS	National Service Scheme
NPTEL	National Programme for Technical Enhanced Learning
OEC	Open Elective (Interdepartmental or interdisciplinary) Course

PCC	Professional Core Course
PCCL	Professional Core Course Laboratory
PEC	Professional Elective Courses
PE	Physical Education
P	Practical
SEC	Skill Enhancement Courses
SEE	Semester End Evaluation
SL	Self-Learning
SGPA	Semester Grade Point Average
SWAYAM	Study Webs of Active-Learning for Young Aspiring Minds
TW	Term Work
T	Tutorial
VTU online	VTU online courses offered by Centre for Online Education,
YOG	Yoga

II. Credit Representation

1-hour Lecture (L) per week=1Credit

2-hoursTutorial(T) per week=1Credit

2-hours Practical / Drawing (P) per week=1Credit

Teaching & Learning Scheme
As per the new National Credit Framework (NCrF), 30 hours of learning of a student is considered equivalent to 1 credit. A semester is considered as a 14-week period of academic interaction with students. The learning components are categorized as follows:

1. **Classroom Instruction (CI):** Includes different instructional / implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts within the classroom measured in Number of hours per semester.
2. **Laboratory Instruction (LI):** Expressed as number of hours per semester which Includes experiments / practical performances / problem-based experiences in laboratory, workshop, field or other locations using different instructional / Implementation strategies.
3. **Term work (TW):** Includes assignments, seminars, presentations, case studies, micro projects, field activities, industrial visits, academic preparation duration and any other student activities in Number of hours per semester.
4. **Self-Learning (SL):** MOOCs (SWAYAM/NPTEL/Industry certified courses), spoken tutorials, online educational resources, self-initiated projects, Learning through digital resources etc in Number of hours per semester. (If provided in curriculum structure).

	Course Details	
1.	**One Credit Theory Courses:**	
	Teaching-Learning sessions in a semester	14 hours
	Examination pattern for CIE and SEE	Multiple Choice Question (MCQ)
	Teaching hours per week - L:T:P	1:0:0
2.	**One Credit Laboratory Courses:**	
	Teaching-Learning sessions in a semester	28 hours (2 hours session /week)
	Examination pattern for CIE and SEE	Continuous assessments, lab Internal test and SEE
	Teaching hours per week - L:T:P	0:0:2
3.	**Two Credit Theory Courses:**	
	Teaching-Learning Sessions in a semester	28 hours

	Examination pattern for CIE and SEE	Descriptive
	Teaching hours per week - L:T:P	2:0:0
4.	**Three Credit ESC/ETC/PCC/PEC/OEC Courses:**	
	Teaching-Learning Sessions in a semester	42 hours
	Examination pattern for CIE and SEE	Descriptive
	Teaching hours per week for theory courses - L:T:P	3:0:0
5.	**Four Credit Program Core Courses (PCC):**	
	Teaching-Learning Sessions in a semester	56 hours
	Examination pattern for CIE and SEE	Descriptive
	Teaching hours per week for theory courses - L:T:P	4:0:0
6.	**Four Credit Integrated Professional Core Courses (IPCC):**	
	Teaching-Learning Sessions in a semester (Teaching sessions: 42 hours + Practical sessions: 28 hours)	70 hours
	Examination pattern for CIE and SEE	Descriptive
	Practical part of examination	CIE (No SEE).
	Teaching hours per week - L: T: P	3: 0: 2

III. Details of Courses

(1) Integrated Professional Core Course (IPCC): The Integrated Professional Core Course (IPCC) refers to a core theory course that is integrated with a laboratory of the same subject. Each IPCC carries 4 credits, with Teaching–Learning hours structured (L : T : P) as either (3:0:2). The theory component of the IPCC shall be evaluated through both Continuous Internal Evaluation (CIE) and Semester End Examination (SEE). The laboratory part shall be assessed exclusively through CIE, with no SEE. However, questions derived from the laboratory part may be included in the SEE question paper to ensure comprehensive evaluation

(2) Non-Credit Mandatory Courses (NCMC): are aimed at enhancing students' knowledge, skills, and awareness beyond the core curriculum. Successful completion of the NCMC is compulsory for fulfilling the requirements of the academic program. It shall not be considered for the computation of SGPA, CGPA and vertical progression. Each student shall register for the prescribed NCMC(s) in the prescribed semester. A student who fails to qualify in the prescribed NCMC shall not be eligible for the conferment of the degree.

(3) Professional Elective Courses (PEC): A professional elective course (PEC) is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum of the same discipline.

(4) Open Elective Courses (OEC): A open elective course (OEC) is a course offered by departments other than a student's parent department. These interdepartmental /interdisciplinary courses allow students to explore disciplines beyond their core area of study. These courses are intended to promote interdisciplinary learning, broad-based education, thereby enhancing a student's overall knowledge, creativity, and employability. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor/Proctor.

(5) Ability Enhancement Course Laboratory (AEC): An Ability Enhancement Course Laboratory is a practical, skill-oriented lab course designed to strengthen students' practical abilities, professional competencies that support communication, environmental awareness, computational thinking, interdisciplinary learning, and application skills through hands-on learning experiences.

The laboratory may pertain to disciplinary or interdisciplinary involving experiments, design tasks, and mini-projects aligned with current industry practices.

(6) Skill Enhancement Courses (SEC): These courses are intended to develop specific practical skills and competencies that improve students' employability, technical proficiency, and professional readiness to bridge the gap between academic and industry requirements. These courses emphasize hands-on training, application of theoretical knowledge, and development of discipline-relevant and transferable skills required in industry and society, and develop entrepreneurship and start-up skills.

(7) Online Courses: Online courses are educational programs delivered over the Internet through a digital platform, allowing students to access lessons, assignments, and discussions from anywhere at any time. Most online courses offer flexibility, allowing students to access materials and complete assignments on their own schedule. However, students have to pass the course within a stipulated period as per the norms of the university.

(8) VTU Online Courses: VTU Online courses are online courses offered by Centre of Online Education (COE) Mysuru. A wide range of multidisciplinary courses are available to learners anywhere, anytime to earn university-prescribed credits through proctored examination for the award of a degree.

(9) NPTEL/SWAYAM Online Courses: The National Programme on Technology Enhanced Learning (NPTEL)/SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) are the specific Indian platforms to host national Massive Open Online Courses (MOOCs). It offers online courses on a wide range of disciplines to learners anywhere, anytime, to earn university-prescribed credits through proctored examination for the award of a degree. All NPTEL/SWAYAM courses are MOOCs, but not all MOOCs are offered on these specific Indian platforms.

IV.   Ability Enhancement Project (AEP) / Skill Development Project (SDP)

An Ability Enhancement Project (AEP) or Skill Development Project (SDP) is a focused project aimed at enhancing specific skills or abilities in a particular domain. It's designed to bridge the gap between theoretical knowledge and practical application.

Key Objectives:
1. Develop practical skills relevant to the industry or field.
2. Enhance problem-solving, critical thinking, and analytical abilities.
3. Improve communication, teamwork, and collaboration skills.
4. Apply theoretical concepts to real-world problems or scenarios.
5. Foster creativity, innovation, and entrepreneurship.

Characteristics:
1. Practical and hands-on approach.
2. Industry-relevant skills and tools.
3. Mentorship and guidance.
4. Opportunity to work on real-world projects or case studies.
5. Emphasis on skill development and enhancement.