Bachelor of Engineering
Scheme of Teaching and Examinations (2025)
Outcome-Based Education (OBE)and Choice-Based Credit System (CBCS)
(Effective from the academic year 2025-26) Common to all Engineering Programmes

I Semester **(Physic Group)**

Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SAAE	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	ASC	1BMATx101	Applied Mathematics -I (Stream Specific Course)	Maths Dept	3	2	0		03	50	50	100	04
2	ASC(IC)	1BPHYx102	Applied Physics (Stream Specific Course)	PHY Dept	3	0	2		03	50	50	100	04
3	ESC	1BCEDx103	Computer-Aided Engineering Drawing (Stream Specific Course)	ME Dept	2	0	2		03	50	50	100	03
4	ESC	1BXXX104x	Engineering Science Course-I	Respective Engg Dept	3	0	0		03	50	50	100	03
5	PSC	1Bxxx105x	Programme Specific Course	Respective Engg dept	3	0	0		03	50	50	100	03
6	AEC (NCMC)	1BSKS106	Soft Skills	Humanities Dept	1	0	0		-	100	---	100	PP
7	PSC	1BxxxL107x	Programme-Specific Course Lab	Respective Engg Dept	0	0	2		03	50	50	100	01
8	AEC/SDC	1BIDTL158	Innovation and Design Thinking Lab **(Project-based learning)**	Respective Dept	0	0	2		03	50	50	100	01
9	HSMS	1BKSK109(BKSK107)/ 1BKBK109(BKBK107)	Samskrutika Kannada/ Balake Kannada	Humanities Dept	1	0	0		01	50	50	100	01
				TOTAL	16	02	08		20	500	400	**900**	**20**
10	**AICTE Activity Points** (students have to earn **100** activity points between 01 to 08 semester)				Compulsory requirement for the award of a degree								

ASC-Applied Science Course, **IC** – Integrated Course (Practical Course Integrated with Theory Course), PSC-Programme Specific Course, **ESC**- Engineering Science Courses, **ETC**-Emerging Technology Course, **AEC**- Ability Enhancement Course, **NCMC:** Non Credit Mandatory Course, **PP** : (Pass/Pass) is assigned to a noncredit 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. **PLC(IC)**- Programming Language Course (Integrated Course), **AEC/SDC**- Ability Enhancement Course/Skill Development course, **TD/PSB**- Teaching Department / Paper Setting Board, **HSMS**-Humanity, Social Science and management Course, **S- (SAAE)** Students' Academic Activity Engagement Hours, **CIE –**Continuous Internal Evaluation, **SEE-**Semester End Examination,

Credit Definition:
1-hour Lecture **(L)** per week=**1Credit**
2-hoursTutorial**(T)** per week=**1Credit**
2-hours Practical / Drawing (**P**) per week=**1Credit**

04-Credit courses are designed for 50 hours of Teaching-Learning Session
04-Credit (IC) is designed for 40 hours' theory and 10-12 hours of practical sessions
03-Credit courses are designed for 40 hours of Teaching-Learning Session
02- Credit courses are designed for 25 hours of Teaching-Learning Session
01-Credit courses are to be designed for 12 hours of Teaching-Learning sessions

Applied Mathematics-I Courses					Applied Physics Courses				
Code	**Title**	**L**	**T**	**P**	**Code**	**Title**	**L**	**T**	**P**
1BMATC101	Differential Calculus and Linear Algebra: CV Stream	3	2	0	1BPHYC102	Physics for Sustainable Structural Systems (CV stream)	3	0	2
1BMATM101	Differential Calculus and Linear Algebra: ME Stream	3	2	0	1BPHYM102	Physics of Materials (Mech stream)	3	0	2
1BMATE101	Differential Calculus and Linear Algebra: EEE stream	3	2	0	1BPHEC102	Quantum Physics and Electronics Sensors (ECE stream)	3	0	2
1BMATS101	Calculus and Linear Algebra: CSE Stream	3	2	0	1BPHEE102	Physics of Electrical Engineering Materials (EEE stream-only for EEE students)	3	0	2
					1BPHYS102	Quantum Physics and Applications (CSE stream)	3	0	2
Computer-Aided Engineering Drawing Courses					**Engineering Science Courses-I(ESC-I)**				
1BCEDC103	Computer-Aided Engineering Drawing for CV Stream	2	0	2	1BESC104A	Building Sciences and Mechanics	3	0	0
1BCEDM103	Computer-Aided Engineering Drawing for ME stream	2	0	2	1BESC104B	Introduction to Electrical Engineering	3	0	0
1BCEDEC103	Computer-Aided Engineering Drawing for ECE stream	2	0	2	1BESC104C	Introduction to Electronics & Communication Engineering	3	0	0
1BCEDE103	Computer-Aided Engineering Drawing for EEE stream (only for EEE students)	2	0	2	1BESC104D	Introduction to Mechanical Engineering	3	0	0
1BCEDS103	Computer-Aided Engineering Drawing for CSE stream				1BESC104E	Essentials of Information Technology	3	0	0
Programme Specific Courses (PSC)					**Programme-Specific Course Labs (PSCL)**				
1BCIV105	Engineering Mechanics	3	0	0	1BMEML107	Mechanics and Materials Lab	0	0	3
1BBEE105	Basics of Electrical Engineering	3	0	0	1BBEEL107	Basic Electrical Lab	0	0	3
1BECE105	Fundamentals of Electronics & Communication Engineering	3	0	0	1BECEL107	Fundamentals of Electronics & Communication Engineering Lab	0	0	3
1BEME105	Elements of Mechanical Engineering	3	0	0	1BEMEL107	Elements of Mechanical Engineering Lab	0	0	3
1BEIT105	Programming in C	3	0	0	1BPOPL107	C Programming Lab	0	0	3
1BEBT105	Elements of Biotechnology and Biomimetics	3	0	0	1BEBTL107	Elements of Biotechnology Lab	0	0	3
1BSSA105	Principles of Soil Science and Agronomy	3	0	0	1BSSAL107	Soil Science and Agronomy Field Lab	0	0	3
1BEAE105	Elements of Aeronautical Engineering	3	0	0	1BEAEL107	Elements of Aeronautica Engineering Lab	0	0	3
1BECHE105	Elements of Chemical Engineering	3	0	0	1BECHEL107	Elements of Chemical Engineering Lab	0	0	3

Integrated courses (IC), combining theory with practical components.

(i) Theory sessions shall be conducted for 3 hours per week, while the practical sessions shall be conducted for 2 hours per week.

(ii)Theory components shall be evaluated through both Continuous Internal Evaluation (CIE) and Semester End Examination (SEE).

(iii)The practical component shall be assessed only through CIE.

The Mathematics/Physics 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 **Maxima/Mathematica/ Python/Scilab/MATLAB software** to enhance computational understanding and application skills **(**one hour for problem solving and one hour laboratory session).

All students admitted to the engineering program have to complete **Applied Mathematics-I and Applied Mathematics-II** in I and II semesters by selecting the courses prescribed for their stream, viz. CV, ME, EEE or CSE, under the heading Mathematics –I and Mathematics-II.

Those who have completed the physics course under the heading Applied Physics in I semester have to select the prescribed stream wise chemistry course under the heading Applied chemistry during II semester.

Programme Specific Courses (PSC): Programme Specific Courses (PSC) are a set of core courses tailored to a specific branch or discipline of engineering in which a student is enrolled (e.g., Mechanical Engineering, Computer Science, Civil Engineering, etc.). These courses are intended to provide students with in-depth knowledge and specialized skills essential for professional competence in the chosen field. Students must select and complete the course from this group that **corresponds to their admitted program stream.** Similarly, students are also required to choose and pass laboratory courses that are specific to their stream from the **Programme Specific Courses Laboratory (PSCL) group.**

Engineering Sciences Courses-I(ESC-I): 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 /Civil Engineering stream should not select Introduction to Building Sciences but any other two. One course shall be selected under ESC-I and another course under ESC-II. The two courses must be different from the other.

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**.**

The **Student Induction Programme** (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. Activities under SIP may include Physical Activities, Creative Arts, Universal Human Values, Literary Events, Proficiency Modules. Lectures shall be by Eminent Personalities, Local Area Visits, Department/Branch Familiarization, and Innovation-related sessions.

The first year of the Engineering programmes is composed of I semester, 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.

The specific programmes to be conducted will be notified separately by the University via the academic calendar or through a separate notification.

AICTE Activity Points Requirement for BE/B.Tech. Programmes

As per AICTE guidelines (refer Chapter 6 – *AICTE Activity Point Program, Model Internship Guidelines*), in addition to academic requirements, students must earn a specified number of **Activity Points** to be earned is to be eligible for the award of their degree.

- **Regular students** admitted to a 4-year degree program must earn **100 Activity Points**.
- **Lateral entry students** (joining from the second year) must earn **75 Activity Points**.
- **Students transferred** from other universities directly into the fifth semester must earn **50 Activity Points** from the date of entry into VTU.

These Activity Points are **non-credit** and will not be considered for **the SGPA/CGPA** or be used for **vertical progression**. However, they are mandatory for the **award of the degree**, and the points earned will be reflected on the **eighth semester Grade Card**.

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.

Sl No	Stream	UG Programmes under the stream with code
1	Civil Engineering Stream (CV)	(1) Civil engineering (CV), (2) Mining Engineering (MI)
2	Mechanical Engineering Stream (ME)	(1)Aeronautical Engineering (AE), (2)Aerospace Engineering (AS),(3) Agricultural Engineering (AG),(4)Automation and Robotics (AR), (5)Automobile Engineering (AU), (6)Chemical Engineering (CH), (7) Industrial & Production Engineering (IP), (8)Industrial Engineering & Management (IM), (9) Manufacturing Science and Engineering (MS), (10) Marine Engineering (MR), (11) Mechanical & Smart Manufacturing (MM), (12) Mechanical Engineering (ME), (13)Mechatronics (MT), (14) Petrochem Engineering (PC), (15)Robotics & Automation (RA),(16) Robotics and Artificial Intelligence (RI),(17)Silk Technology (ST), (18) Textile Technology (TX),(19)Energy Engineering (ER),(20) Smart Agritech (SA).
3	Electrical and Electronics Engineering Stream (EEE)	(1)Electronics & Communication Engineering (EC), (2)Biomedical Engineering (BM), (3)Electrical & Electronics Engineering (EE), (4) Electronics & Instrumentation Engineering (EI),(5) Electronics & Telecommunication Engineering (ET),(6) Industrial IoT (IO), (7) Medical Electronics Engineering (ML),(8) Electronics Engineering (VLSI Design and Technology) (VL),(9) Electronics & Communication(Advanced Communication Technology) (EA),(10) Electronics & Computer Engineering (UE).
4	Computer Science and Engineering Stream (CSE)	(1) Computer Science and Engineering (CS), (2) Computer Engineering (CE), (3)Artificial Intelligence and Data Science (AD), (4) Artificial Intelligence and Machine Learning (AI),(5) Biotechnology (BT),(6)Computer & Communication Engineering (CM), (7) Computer Science and Business System (CB),(8) Computer Science and Design (CG),(9) Computer Science and Engineering (IoT) (CO), (10)CSE(Artificial Intelligence and Machine Learning) (CI),(11) CSE(Artificial Intelligence) (CA),(12) CSE(Cyber Security) (CY), (13)CSE(Data Science) (CD),(14) CSE(IoT and Cyber Security including Block Chain Technology) (IC), (15) Data Science (DS), (16) Information Science & Engineering (IS),(17) Computer Science (CR).

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Outcome-Based Education (OBE)and Choice-Based Credit System (CBCS)
(Effective from the academic year 2025-26) Common to all Engineering Programmes

II Semester (For the students who have studied Physics group in I semester)

Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SAAE	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	ASC	1BMATx201	Applied Mathematics -II (Stream Specific Course)	Maths Dept	3	2	0		03	50	50	100	04
2	ASC(IC)	1BCHEx202	Applied Chemistry (Stream Specific Course)	CHE Dept	3	0	2		03	50	50	100	04
3	ETC	1BAIA203	Introduction to AI and Applications	Any Dept	3	0	0		03	50	50	100	03
4	ESC	1BESC204x	Engineering Science Course-II	Respective Engg Dept	3	0	0		03	50	50	100	03
5	PLC(IC)	1BPLC205x	Programming Language Course	CSE & allied Dept	3	0	2		03	50	50	100	04
6	AEC	1BENG206	Communication Skills	Humanities Dept	1	0	0		02	50	50	100	01
7	AEC (NCMC)	1BICO207	Indian Constitution & Engineering Ethics	Humanities Dept	1	0	0		01	100	0	100	PP
8	AEC/SDC	1BPRJ258	Interdisciplinary Project-Based Learning	Respective Dept (Multiple Dept)	0	0	0	2	02	50	50	100	01
				TOTAL	**17**	**02**	**05**	**02**	**20**	**450**	**350**	**800**	**20**

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Integrated courses (IC), combining theory with practical components.
The theory sessions shall be conducted for 3 hours per week, while the practical sessions shall be conducted for 2 hours per week.

- The theory component will be evaluated through both Continuous Internal Evaluation (CIE) and Semester End Examination (SEE).
- The practical component will be assessed only through CIE.

Communication Skills: This course shall be conducted in a laboratory environment

Applied Mathematics-II Courses					Applied Chemistry Courses				
Code	**Title**	**L**	**T**	**P**	**Code**	**Title**	**L**	**T**	**P**
1BMATC201	Differential Calculus and Numerical Methods: CV Stream	3	2	0	1BCHEC202	Applied Chemistry for Sustainable Structure & Material Design (CV)	3	0	2
1BMATM201	Multivariable Calculus and Numerical Methods: ME Stream	3	2	0	1BCHEM202	**Applied Chemistry for Advanced Metal Protection and Sustainable Energy Systems** (ME)	3	0	2
1BMATE201	Calculus, Laplace Transform And Numerical Techniques: EEE stream	3	2	0	1BCHEE202	**Applied Chemistry for Emerging Electronics and Futuristic Devices** (EEE, ECE)	3	0	2
1BMATS201	Numerical Methods: CSE Stream	3	2	0	1BCHES202	Applied Chemistry for Smart Systems (CSE)	3	0	2
Engineering Sciences Courses II(ESC-II)					**Programming Language Courses (PLC)**				
1BESC204A	Building Sciences & Mechanics	3	0	0	1BPLC205E	Introduction to C Programming (for non-IT programmes)	3	0	2
1BESC204B	Introduction to Electrical Engineering	3	0	0	1BPLC205B	Python Programming (For CSE and allied programmes)	3	0	2
1BESC204C	Introduction to Electronics & Communication Engineering	3	0	0					
1BESC204D	Introduction to Mechanical Engineering	3	0	0					
1BESC204E	Essentials of Information Technology	3	0	0					

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 **Maxima/Mathematica/ Python/Scilab/MATLAB software** to enhance computational understanding and application skills.

Students admitted to a specific engineering stream are required to select and successfully complete **Applied Mathematics-II** and **Applied Chemistry courses** that are aligned to their program stream.

Engineering Sciences Courses-II(ESC-II): 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 disciplines. Students are required to select and complete a course under ESC-II that does not belong to their admitted program stream. Students should select a course other than that was selected under ESC-I and other than course not belonging to their branch/ stream.

For the course ***Interdisciplinary Project*** **(BPRJ259)**, 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.