

(Deemed to be University) - Estd. u/s 3 of UGC Act 1956

# **R25** Regulations for BACHELOR OF TECHNOLOGY PROGRAMME





(Deemed to be University) - Estd. u/s 3 of UGC Act 1956



In Compliance with NEP 2020



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# **PREFACE – R25**

Change is the only permanent thing. The happening of Change implies continuous morphing, - iterative refinement, leading to evolution. There cannot be an end in the process of evolution, however an imagined target could be the goalpost to drive the change. The regulation R-25 could be one such stage during the saga of transition in pursuit of quality in learning.

The focal point in higher education should be learning, which should serve as foundational premise for unlearning, relearning and continuing to learn lifelong. This ability for the creativity towards learning has got to be seeded and allowed to be sprouted by the mentors who would provide handholding and lead the potential and untapped youngsters to be able to think, because learning should imbibe thinking – thinking logically; thinking on how to internalise, how to imbibe and then how to invent and implement.

The regulation R-25, is in the sequel to R-22. As focused in R-22, R-25 aims to more effectively channelize the policies brought out in National Educational Policy – NEP 2020, into practice.

The anticipated challenges in store for the future, the agenda of accomplishing Sustainable Development Goals (SDGs) and the largely unexplored hidden treasure of Indian Knowledge System (IKS), if could be modulated through the carrier framework of NEP-2020, would be impactful in bringing out an eminent thinker in every genuine learner. And realising this objective is the motivation in bringing out VIGNAN's Regulation R-25.

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# PREFACE – R22

'You are born to Blossom — What an inspiring title the book authored by APJ Abdul Kalam and Arun K Tiwari carries. The journey to blossom has got to be heralded by education. The purpose of education is to ensure that the 'Life Blossoms'. Earning a degree and getting a placement should be the just happening things, and should not become the only celebrated goals for education. In the book cited above, Honourable Kalam, Former President of India, underscores that "The scheme of civil society depends on Educating young people to become enlightened citizens and adults who are responsible, thoughtful and enterprising"

VIGNAN aims to seed these concepts in every learner who transits through this temple of learning. The doctrine of VIGNAN entitled R-22 contains the principles of policies laid down by the University, to realize the spirit of "Blossoming the lives" providing a foundation-strong professional education on the ethos of 'Creative learning for Critical thinking and Critically analysing for Creative decision making'. Certainly, our University is one of the earliest Universities, in fact the University is a trend setting one in completely internalising the concepts of the policies brought out in National Education Policy (New Educational Policy) NEP-2020, and inculcating the spirit in R-22. The R-22 document articulates the Academic Regulations of the University, which is being presented now and shall be inforce with immediate effect from the academic year 2022-23, not only for those who have joined in 2022, also the aspirants of 2021-22 are enabled into the navigation.

*R-22 presents a novel design for the academic pursuit, making an exploratory cross disciplinary traversal for a learner who should find learning both holistic and experiential. The learner is ensured to enjoy the continuity in learning and the learner is supported to align and realign, enroute utilising the benefits of constructive feedbacks that s/he receives because of continuous assessment. S/he will be empowered to enjoy the opportunities to explore, experiment and experience.* 

*R-22* eliminates the melancholy of examinations. The expected severity of breakdown due to the anxiety of examination system is replaced by an affectionate assessment system, increasing the effectiveness in accomplishing the outcomes.

In brief, NEP-2020 compliant revised academic regulation of the University — the R-22, is VIGNAN's commitment to alleviate the acuteness in the present educational practices. It intends to provide a strategic solution to the critical observation made by Bharat ratna awardee, Professor. CNR Rao — "India has exam system, not education system. Men will young people stop taking exams and do something worthwhile?" (Thought for the Day, Times ofIndia 13.08.2022)

*Here is R*-22, *which assures that the learners at VIGNAN are bound to do something worthwhile* — *very much worthwhile.* 

R25 B.Tech 4 YEAR DEGREE PROGRAMME

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# Academic Regulations, Curriculum and Course Contents

# R25 B.Tech 4 YEAR DEGREE PROGRAMME

#### **EXECUTIVE ABSTRACT**

The Academic Regulations - R25, Curriculum, and Course Structure of VFSTR Deemed-to-be University are designed in alignment with NEP-2020, emphasizing continuous learning, continuous assessment, and competency-based education. These regulations build upon the experiences gained during the implementation of R-22 since A.Y. 2022-23, which was also an exercise of inculcating and internalizing NEP-2020. Insights from R-22 have led to refinements in the curriculum, course structure, pedagogy, and assessment tools, resulting in a more mature, robust, and adaptive educational framework-R25.

The new course structure incorporates a two-module system, where Module-1 focuses on strengthening foundational knowledge and conceptual clarity, while Module-2 fosters higher-order thinking, problemsolving, and innovation. The curriculum adopts the **T-shaped learning philosophy**, balancing breadth (horizontal line) and depth (vertical line) in knowledge acquisition. The vertical line represents deep expertise in core engineering domains, while the horizontal line encourages cross-disciplinary learning and adaptability, equipping students with both rich foundations and diverse competencies for research, industry, and entrepreneurship.

Furthermore, the program ensures an integrated and rigorous learning experience across science, humanities, management, basic engineering, and specialized engineering domains. Rather than offering superficial exposure, the curriculum is designed to provide in-depth engagement in these areas. It offers students the flexibility to choose electives not randomly from other fields but from domains related to and enhancing the scope of their cognitive field, ensuring meaningful multidisciplinary learning. This fosters a truly multidisciplinary and holistic education that bridges theoretical knowledge with practical application. In alignment with this vision, relevant concepts from the **Indian Knowledge System** (IKS) have been woven into a few courses, enriching modern scientific approaches with India's rich intellectual traditions. Additionally, all courses in the curriculum are mapped with relevant **Sustainable Development Goals** (SDGs), reaffirming VFSTR's commitment to fulfilling the SDGs through education.

To provide greater academic flexibility, R25 introduces a provision of '**Creative Work-in-Lieu of a Course**', enabling students to substitute a conventional elective with creativity driven exploration that leads to research-based outcomes such as peer-reviewed publications, patents, or innovative projects. This initiative encourages students to engage with impactful research and real-world problem-solving, fostering a culture of innovation and intellectual contribution. Additionally, experiential learning has been infused throughout the curriculum, ensuring students gain hands-on experience through industry collaborations, prototype development, and applied research initiatives. Experiential learning is seamlessly integrated into the academic structure, with assessments aligned to capture the depth and authenticity of learning through experience.

As part of the R-25 regulations, VFSTR pioneers a **Pre-Semester Initiative**, a first-of-its-kind approach that enables students to undertake preparatory learning modules before the formal commencement of their first-year, first semester. This initiative aims to bridge knowledge gaps, strengthen foundational concepts, and provide early exposure to key subject areas, ensuring students are well-prepared for advanced coursework. In brief the pre-semester creates an interface for taking up learning at higher level.

The assessment strategy is structured into six formative assessment stages (Pre-T1, T1, T2, T3, T4 & T5), ensuring a **continuous and comprehensive assessment model** that progressively aligns with revised Bloom's Taxonomy and the T-shaped learning framework, reinforcing Learning–Thinking–Understanding–Skilling–Applying–Creating at each stage. The emphasis on continuous assessment is driven by the principle of continued learning, where students are consistently engaged with concepts and skills throughout their academic journey.



The four-year B.Tech. program follows a flexible and student-centric approach, incorporating **lateral entry and honorable exit options**. Students completing the required credits after three years may earn an Engineering Diploma or a three-year Bachelor's Degree, facilitating early career opportunities while retaining the option to return and upgrade their qualifications. However, the primary focus remains on ensuring students acquire a full B.Tech. degree, enriched by add-on certifications such as Honours, Minors, and Add-on Diplomas. Additionally, for students who wish to progress at a slower pace, a spillover period of up to three additional years is available for degree completion, ensuring academic flexibility without compromising learning outcomes. By integrating **multidisciplinary exposure, skill-based learning, and holistic assessment,** VFSTR reaffirms its commitment to developing well-rounded, future-ready professionals in accordance with NEP-2020's transformative vision.

#### SALIENT FEATURES OF THE REGULATION

- Multidisciplinary
- Continuous learning
- Continuous assessment
- T-Shaped Learning Philosophy
- Creative Work-in-Lieu of a Course
- Pre-Semester Initiative

#### VALUE ADDITION

- Honours/ Research Honours / Minor / Add-on Diploma / Add-on Certification
- Lateral entry and honorable exit options
- Sabbatical Semester Drop option to pursue innovation, incubation, entrepreneurial and advanced exploratory activities and subsequent re-entry
- Credit earning by credit transfer

#### **1** INTRODUCTION

This document contains the academic regulations, scheme of assessments, curriculum, detailed syllabi, course contents with text / reference books recommended, course outcomes, skills expected to be acquired and the projects / assignments that are to be performed for each course for the conduct of 4-year B.Tech. degree programmes. The various B.Tech. degree programmes under different schools in VFSTR are as listed below. The 2-character codes indicated in parentheses are their branch discipline codes.

#### I. School of Agriculture and Food Technology

- Food Technology (FT)
- II. School of Biotechnology and Pharmaceutical Sciences
  - Bioinformatics (BI)
  - Biotechnology (BT)

#### III. School of Computing and Informatics

- Computer Science and Engineering (CS)
- Computer Science and Engineering Artificial Intelligence and Machine Learning (AI)
- Computer Science and Business Systems (CB)
- Computer Science and Engineering Cyber Security (CY)
- Computer Science and Engineering Data Science (DS)
- Computer Science and Engineering Internet of Things (CI)
- Information Technology (IT)

#### IV. School of Core Engineering

- Chemical Engineering (CH)
- Civil Engineering (CE)
- Mechanical Engineering (ME)
- Robotics and Automation (RA)

- Textile Technology (TT)
- Technical Textiles (TX)
- V. School of Electrical, Electronics and Communication Engineering
  - Biomedical Engineering (BM)
  - Electrical and Electronics Engineering (EE)
  - Electronics and Communication Engineering (EC)
  - Electronics Engineering VLSI Design and Technology (VL)

#### 1.1 Definition

#### For the purpose of R25 regulation, definitions as follows shall apply:

- "Degree" shall refer to the B.Tech. Degree Program.
- "Course" shall refer to such Course(s) for which a student shall earn Credits after due assessment as per the laid provisions. Project is also treated as a Course.
- "Academic activities" shall refer to the activities like Lecture-L (Physical Lecture Session), Transactions (Tutorial)-T (Participatory discussion / Self-Study / Desk Work / Quiz / Seminar Presentation, etc. activities that make the student absorb & assimilate, the delivered contents effectively) and Practical / Practice Sessions-P (includes Hands on Experience / Lab experiments / Field Studies / Case Studies etc. activities that enable the student to acquire the requisite skill).
- "Credit" refers to a unit of measurement assigned to courses based on the weekly instructional hours. Typically, one credit corresponds to one hour of lecture (L) or two hours of transaction (T) / practices (P) sessions per week.
- "Continuous Assessment" shall refer to the assessment of the student spread over the entire semester on the various constituent components of the prescribed course.
- "Semester" shall refer to a period covering the two assessment periods viz Formative and Summative Assessment period. A semester would generally be spread over twenty weeks.
- "Pre-Semester" refers to a short 6-week program held before the first-year first semester. It primarily focuses on improving students' proficiency in English and Mathematics to help them reach the desired academic level.
- "Course Drop" shall refer to a student having to undertake a 'Repeat (R)' of the Course(s) not being able to complete the Credit requirements of the Course(s), under the conditions stipulated in the regulation.
- "Supplementary Examinations" shall refer to the examination(s) conducted to allow the student to appear in the un-cleared / Incomplete (I) Semester End summative assessment component.
- "Blank Semester" shall refer to a Semester in which a student either does not register for any course at the beginning of the Semester OR chooses to DROP all courses OR is so compelled to DROP all the courses, as the case may be.
- "Semester Drop" shall refer to availing a blank semester. However, if drop is availed to pursue a creative extension activity, then it is defined as semester sabbatical.
- "Spill Over Semester" shall refer to the additional semester(s) beyond the completion of prescribed normal semesters.
- "AAA Section" shall refer to the Academics, Assessment and Awards section of the Institute.
- "Attendance" refers to the Physical personal presence in an academic activity session.
- "Summer Semester" refers to a Semester that is scheduled to be held during the intervening period of Even and Odd Semester (i.e. Summer Vacation period).
- **"Themes"** refer to the courses offered in a particular stream other than offered by the regular departments, for example NCC, Entrepreneurship, Fitness and Living, etc.
- "School" refers to a division of institute dealing with two or more specific areas of





discipline / study comprising of the departments related with exclusive emphasis on trans-disciplinary research.

- "Department" refers to a division of institute dealing with a specific area of discipline / study.
- "HoD" refers to the Head of the respective Department, where the student is enrolled for his / her Branch of Study.
- "Center" refers to a structured unit within the school / department established with the purpose to carry out advanced research.
- "Grade Point" refers to the quantification of the performance of a candidate in a particular course as defined herein.
- "SGPA" refers to the Semester Grade Point Average and is calculated as detailed in the regulations subsequently.
- "CGPA" refers to the Cumulative Grade Point Average and is calculated as detailed in the regulations subsequently.
- "**Division**" refers to the Division awarded to the student as per the mechanism detailed in the regulations subsequently.
- "Internship" refers to onsite Practical Training offered by reputed companies / Institutions, in India or abroad. To be undertaken with (or seeking) prior approval of the respective HoD.
- "Project" refers to a course executed by a candidate on a specific research problem / product or process development at VFSTR / any organization of repute. To be undertaken with (or seeking) prior approval of the respective HoD.
- "Credit equivalence and credit transfer committee" refers to the committee designated to look into for credit equivalence and credit transfer.
- "Honorable Exit Option" refers to the Exit Options available to students, when they are unable to complete the prescribed four-year B.Tech. Degree program in seven successive years or would like to voluntarily exit.

#### 1.2 Academic Administration

The academic programmes of VFSTR are governed by the rules and regulations approved by the Academic Council from time to time. The various academic activities are conducted following a fixed time schedule duly approved by the Academic Council in line with the AICTE / UGC regulations. The academic activities of VFSTR are followed meticulously as specified in the academic calendar as approved by the Academic Council. This academic calendar is shared with all the stake holders well before the beginning of the respective academic year. The curriculum and the course contents of all the programmes are discussed by the respective Board of Studies (BoS), analyzed and recommended for implementation. The Academic Council, being the highest statutory body, chaired by the Vice-Chancellor, meets four times a year and discusses, suggests and approves all the important academic matters related to curriculum and course contents in particular including the recommended by the Academic Council in its 40<sup>th</sup> meeting on 22-02-2025.

#### 1.3 Program Duration

For the branch disciplines listed in section (1), the regular courses including theory and practical are offered over a period of four years in eight semesters. The normal duration to complete the B.Tech. program is four years. However, in alignment with NEP-2020 and UGC provisions, advanced learners can complete the B.Tech. program in 3.5 years through the Accelerated Degree Program by fulfilling the credit requirements (Annexure 1). Additionally, students can benefit from the Extended Degree Program, availing a spill over period for 3 years, allowing a maximum duration of seven years to complete the B.Tech. programme at a slower pace if he / she desires. This flexibility caters to diverse learner needs and career aspirations, supporting both accelerated and extended degree pathways. Candidates failing to complete the requirements within this period will be considered for an honorable exit, as applicable. Honorable exit can also be exercised by a candidate voluntarily.

#### 1.4 Courses and Credits

The term course is used in a broader sense to refer to so called papers such as 'theory subject', 'laboratory', 'inter-departmental / field project', 'major-project' etc. A course can be of theoretical and/ or of practical nature, and certain number of credits are allotted to it depending on the number of hours of instruction per semester. For a course offered in a semester, one hour of lecture (L) instructions carried out in a week is considered equivalent to one credit, whereas two hours of practical (P) sessions done in a week are considered equivalent to one credit respectively. Depending on the course two hours of tutorial (T) sessions may be considered equivalent to one credit. A student earns these credits when he/ she successfully completes the course. Credits can also be obtained by successful completion of other recognized co-curricular and extra-curricular activities such as NCC, NSS, Yoga, Dance, Music, Painting, etc. The details of credits of such activities will be provided by the respective course coordinators and assessment of student performance in the activities will be carried out objectively by the constituted committees appointed by the Dean AAA. The criteria of assessment for these activities will include aspects like regular attendance in the programme and satisfactory completion of it through assessments conducted at University level or by participation / performance at university level events, state level or national level participation etc. Add-on credits earned in a specified manner will lead to earning B.Tech., B.Tech. with Honours, B.Tech. with Research Honours, B.Tech. with Minor, B.Tech. with Add-on Diploma and B.Tech. with Add-on Certification.

#### **1.4.1 Content Delivery of a Course**

Content delivery of a Course in the B.Tech. Degree Program shall be through, either or all, of the following Methods:

- i. Lecture refers to Lecture Session(s) through classroom contact session wherein students will learn by listening. Denoted by "L".
- ii. Tutorial refers to transaction(s) consisting of Participatory discussion / Self-study / Desk work / Brief presentations by students along with such other novel methods that enable a student to efficiently & effectively absorb and assimilate the contents delivered in the lecture sessions. Denoted by "T".
- iii. Practice refers to Practice / Practical sessions and it consists of Hands-on- Experience / Laboratory Experiments / Field projects / Case Studies / Minor / Major Project, that equip the students to acquire the much required skill component. Denoted by "P".

#### 1.5 B.Tech. Degree

All students formally and conventionally enroll for B.Tech. degree programme. They have to earn **160+10** credits for the award of degree as specified in the Curriculum, wherein 160 credits shall be referred as 'Graduating credits' and assigned towards courses such as Professional Core, Electives, Basic Engineering, Humanities and Management, Basic Sciences and Projects. Additional 10 credits are referred as 'Compulsory Binary Grade Credits' and shall be awarded for various binary grade courses specified in the curriculum. However, additionally he/she can opt to earn up to 16 more credits as Add-on credits, to earn the academic benefits as specified below.

#### 1.5.1 B.Tech. with Honours Specialization: XX

A candidate may earn additional 16 credits, cumulatively totalling to **176+10** credits in the respective discipline spread over fifth to eight semesters to become eligible for the award of B.Tech. with Honours in YY Engineering (Specialization: XX)

If the add-on credits are designed to take-up a research activity and to complete a research thesis under the scope of 176+10 credits, then he/she become eligible to receive the award of B.Tech. with Research Honours in YY Engineering (Specialization: XX). However, admission stipulations are applicable for a candidate to pursue B.Tech. with Research Honours. Annexure-2 provides the supplement regulations for the award of B.Tech. with Research Honours.

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#### 1.5.2 B.Tech. with Minor Specialization in XX

A candidate may earn additional 16 credits, cumulatively totalling to 176+10 credits in anyone of the other disciplines spread over fifth to eight semesters to become eligible for the award of B.Tech. in YY Engineering with Minor Specialization in XX.

YY refers to name of the Branch discipline (E.g. CSE / ECE / BT); XX refers to a particular specialization within a Branch discipline.

#### 1.5.3 B.Tech. with Add-on Diploma

If a candidate earns add-on 16 credits from assorted disciplines/ themes/ centers, then he/ she will be eligible for the award of B.Tech. with Add-on Diploma.

#### 1.5.4 B.Tech. with Add-on Certification

If a candidate in accordance with the sections of 1.5.1, 1.5.2, and 1.5.3 earn additional credits, but will not satisfy the completion of 16 credits, then he / she will be eligible to receive B.Tech. with Add-on Certification. However, such a candidate may also avail a spill over semester to complete 16 credits.

Note: The consolidated transcript will contain the credits and grade details of all courses amounting to 160+10 + up to 16 credits.

#### 1.6 Composition of an Academic year

An academic year is composed of an Odd semester (20 - 22 weeks), an Even semester (20 - 22 weeks) and a Summer semester (6 - 8 weeks). The regular semester that begins in July / August is known as odd / first semester and the one that begins in December / January is known as even / second semester (Figure 1). The instructional days for a regular semester shall be a minimum of 90 working days exclusive of days earmarked for summative assessment. However, the first-year academic calendar varies slightly to accommodate the 'Pre-semester' (Section 1.8 for details).

YEAR OF 12 MONTHS											
1	2	3	4	5	6	7	8	9	10	11	12
July/ Aug.	Aug./ Sept.	Sept./ Oct.	Oct./ Nov.	Nov./ Dec.	Dec./ Jan.	Jan./ Feb.	Feb./ Mar.	Mar./ Apr.	Apr./ May	May/ June	June/ July
ODD SEM/ FIRST SEM					EVEN SEM/ SECOND SEM					SUMMER SEM	

Figure 1: Distribution of semesters during an Academic Year.

- 1.6.1 Before the commencement of the semester, a candidate has to pay the stipulated tuition fee and submit an application detailing the courses he / she intended to register, valid for that respective Odd / Even semester. The maximum number of credits per semester will be 25 credits inclusive add-on credits. The intended semester wise coverage will be as presented in the curriculum.
- **1.6.2** Summer semester is a short duration semester program that will be generally conducted during the semester break between even semester and odd semester. The students having 'R' (Repeat grade) courses may register for the course work during this semester to get a chance for successfully completing the 'R' courses. In general, supplementary assessments are conducted in the later part of the summer semester. However, the courses offered in summer semester and the number of courses a student can register are subjected to academic and administrative convenience. A student may register up to a max. of 16 credits in a summer semester.
- 1.6.3 Exception to the routine practice of registering for 'R' courses in summer semester, a student can register in a course offered by a visiting expert during the summer vacation which may be equivalent to an open elective or a department elective or an Add-on-course. The candidates can register for such courses within the scope of 16 credits. Candidate may also avail summer semester for summer internship opportunities, which may be considered as Add-on credits.

1.6.4 Summer internship credits will also be appended to the credits of Department elective / Honours / Minor / Add-on certification provided the theme of internship is in accordance with the specialization.

#### 1.7 Semester wise provisions

A student may register for a max of 25 credits per semester as prescribed or otherwise he/ she may include the Repeat courses in the event of having not successfully completed a course or courses in the earlier semester. However, a student may also opt to go in a slower pace to earn the credits less than the prescribed max of 25, including even 'Dropping' a semester for special reasons.

It should be clearly underscored that a candidate should on priority register for Repeat (R) credits if any, during a regular semester, within the said scope of 25 credits; in case he / she cannot be sure of completing the 'R' credits in Summer semester.

- 1.7.1 During the first four years from the date of admission to B.Tech., a candidate has to pay the semester / annual fees as prescribed irrespective of the less number of credits / semesters that he / she would register or even opt to Drop a semester.
- 1.7.2 If a candidate gets into spill over semester beyond four years up to a maximum of seven years he / she has to pay semester fee proportional to the credits that he/ she registered in that spill over semester as prescribed from time to time.
- **1.7.3** A candidate has to pay additional fee proportional to the number of credits for registering in a summer semester as prescribed from time to time.

#### 1.8 Pre-Semester Program

The Pre-Semester Program is an integral addition to the first-year academic structure, complementing the existing Odd, Even, and Summer semesters. Positioned between the orientation program and the first regular semester, it is designed to equip newly admitted students with essential academic skills, ensuring a smooth transition into engineering education. By addressing foundational learning gaps and strengthening core competencies, this preparatory phase enhances students' readiness for the rigorous curriculum ahead.

Recognizing that students come from diverse educational backgrounds and the specific requirements of engineering education, this program bridges the gap by emphasizing the application of mathematical concepts in problem-solving and fostering effective communication skills. By assessing students' prior knowledge, the program identifies learning gaps and systematically addresses them. Students who complete this pre-semester are better positioned to assimilate course content effectively and make the most of the skill-building opportunities embedded in the curriculum. Engineering education demands analytical thinking, continuous learning, and the ability to apply foundational knowledge in real-world scenarios, making this preparatory program essential.

To achieve these objectives, the Pre-Semester Program encompasses six 1-credit courses (Table 1). During the orientation session that precedes the pre-semester program, a preliminary assessment will be conducted to evaluate students' proficiency levels. Based on their performance, students will be grouped into four levels – Beginner, Intermediate, Advanced, and Proficient. Classwork will then be tailored to each batch to address their specific needs, ensuring that all students, regardless of their academic background, are brought to a common baseline before formally entering the B.Tech. program.

 Table 1. List of courses and credits offered during the Pre-Semester Program

Course Title	Credits
Mathematics	1
English Communication	1
Aptitude & Logical Reasoning	1
IT Tools	1
Binary Graded	1
Binary Graded	1
Total	6

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The teaching-learning process in these courses is activity-based, prioritizing conceptual understanding and skill development rather than mere scoring. To align with this philosophy, the program follows an assessment structure with 100% weightage for formative assessment and no summative assessment. This ensures that learning is continuous, interactive, and application-driven, helping students internalize concepts effectively.

A dedicated academic calendar has been developed to seamlessly integrate this program into the academic structure, reinforcing continuous learning practices and preparing students for the rigors of engineering education (Figure-2).

YEAR OF 12 MONTHS – Extended Calendar (I year)													
1	2	3	4	5	6	7		8	9	10		11	12
July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan		Feb.	Mar.	Apr.	Ν	/lay	June
OP	Pre –	Sem.	Format	ive Asse	ssment	nt S Formative Assessment			s	V			
ODD SEM/ FIRST SEM ODD SEM/ FIRST SEM					EM EVEN SEM/ SECOND SEM								
OP = Orientation Program S = Summative Assessment (10 days); V =Vacation / Summer Semester (30 Days)													

Figure 2: Distribution of semesters during First Academic Year

#### 2. CURRICULUM

Each School offers different B.Tech. degree programmes and the departments concerned prescribes semester-wise curriculum encompassing different courses. Every course offered will be designated in a L-T-P-SL structure. The theory courses comprise of L (and / or T & P hours) whereas the practical courses include transactions (T) and practical sessions (P). Amalgamation of theory courses with practical sessions is predominantly seen in this curriculum. The 'SL' represents the expected self-learning hours (to be carried out by each student) in a particular course.

During the first year, some of the courses may be offered in a swap mode, that is the same course is offered in both the semesters of I-year to accommodate the academic and administrative requirements.

#### 2.1 Distribution of credits

The overall distribution of credits for various categories of courses in the curriculum of B.Tech. programmes is represented in Table (2) as given below.

Category of Courses	Number of Credits	Percentage of Credits	AICTE Recommendation (%)
Professional Core	50	31.25%	30 - 36%
Electives (Department & Open / I²C)	33	20.63%	19 - 23%
Basic Engineering	20	12.42%	10 - 18%
Humanities and Management	13	8.13%	08 - 09%
Basic Sciences	30	18.75%	12 - 16%
Projects	14	08.75%	08 - 11%
Total	160	100%	
Binary graded	10	-	-

Table-2 : Credits Distribution for Various categories of courses

#### 2.2 Organization of course contents

Courses offered in the program are composed of two modules, covering all the course contents required for a candidate to obtain knowledge and skill. Module-1 is divided into two units, focusing on the 'Fundamentals and Broad Perspective' of the course while also introducing basic applications to establish a practical context. In contrast, Module-2 is divided into three units, which encompass the extension and advanced topics of Module-1. Both modules will include a separate list of suggested transactions or practices tailored to its content. These transactions / practices are essential for validating and applying the knowledge gained during Lecture sessions.

Module-1 may be completed within 5 to 6 weeks, while Module-2 may require 9 to 10 weeks. By the end of each module a candidate must be in a position to translate his/ her L-based knowledge into P-based skill as prescribed in the curriculum. Individual formative assessment shall be in place for each module and a single semester-end summative assessment for the course composed of both the modules.

The course contents are mapped with relevant Sustainable Development Goals (SDGs), ensuring alignment with global sustainability objectives. Additionally, where authenticated information is available, Indian Knowledge System (IKS) topics are incorporated into the curriculum.

Each course must have 4 to 6 course outcomes (COs) mapped to relevant program outcomes (POs), aligning with the revised Bloom's Taxonomy levels 3, 4, 5, and 6 ensuring progressive cognitive development. Furthermore, every course has at least one mandatory textbook and two to three reference books to provide students with credible and in-depth learning resources.

#### 2.3 Prerequisite Knowledge

Wherever prerequisite knowledge is mentioned, a student must register for the required courses covering the specified content before he/she register in a higher-level course. There are two types of prerequisites: for some courses, successful completion of the prerequisite (i.e., earning credits) is mandatory before registration in the higher-level course; for others, completion of formative assessments in the prerequisite course is sufficient, and students become eligible to register for the higher-level course as long as they do not have an 'R-grade' in the prerequisite course.

#### 3. NATIONAL CREDIT FRAMEWORK / CHOICE BASED CREDIT SYSTEM

Each branch discipline of the B.Tech. programme comprises of a set of courses - basic sciences, humanities and management, basic engineering, professional core, electives, employability & life skill courses. VFSTR offers flexibility for students to choose courses of their choice and obtain the credits satisfying the minimum credits criterion in each category as given in Table (1).

#### 3.1 Common (Core) Courses for all branch disciplines

First year curriculum is intended to provide foundational understanding of basic concepts across various engineering disciplines. It covers fundamental subjects like basic sciences, basic engineering, humanities and management. Curriculum have common first-year course structure (two streams – M.P.C & Bi.P.C background) to ensures that all students regardless of their prior education should acquire similar level of knowledge and skills before they start their specialized courses in the second year. In some cases, students might want to change their specialization after the first year. A common first-year structure makes it easier for them to switch between different engineering disciplines without having to repeat a significant portion of their coursework.

#### 3.1.1 Basic Sciences and Humanities

Basic science courses are included to provide engineering students with a strong foundation in scientific principles that support technological advancements and problem-solving. Courses in Management and Humanities are also included to develop their professional competence and interpersonal skills. Management courses equip students with essential skills in leadership, decision-making, and project management, preparing them for both technical and managerial roles in their careers. Humanities courses enhance their ability to communicate effectively, think critically, and uphold ethical and professional responsibilities.

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#### 3.1.2 Basic Engineering

Basic engineering courses are those that every engineer, irrespective of his discipline, ought to understand to perform well in his/her discipline. Engineering drawing, IT Tools & Cyber security, Computer Programming are some of the courses that fall in this category.

#### 3.2 Professional Core

Professional Core courses are individualized for each programme and they are mandatory for every student opting for that branch discipline. These are designed to offer the essential fundamental knowledge and skills required for that specific programme.

#### 3.3 Electives

A candidate has a choice to choose the elective courses. A list of elective courses is pooled together, enabling a candidate to choose electives from a pool so that he/she can focus on a specific theme. Otherwise also he/ she can also exercise the choice to choose electives from across the pools. There may be courses which may not be listed under any pool, which are called 'Free elective courses'.

Elective courses offered for each programme are categorized as 'department electives' and 'open electives'. Some electives may have pre-requisites i.e., successful completion of a course / knowledge of a course / the department's consent.

#### 3.3.1 Department Electives

'Department electives' are those courses that are aimed at offering the advanced/ additional knowledge in the chosen branch discipline.

Care should be exercised while opting for departmental elective courses and specialization courses such that a course opted as departmental elective should not be registered as a course under Specialization and vice versa.

#### 3.3.2 Industry – Interface (I<sup>2</sup>) courses

I<sup>2</sup> courses are offered with the support of industry personnel and are also included in department elective category. These courses are of one credit, and are offered by experts from industry / academia. The I<sup>2</sup> course is offered to B.Tech. students with 15 hours' duration as Binary graded course. The duration of 15 hours can be spread across 3 days continuously or 3 different slots of 5 hours each on consecutive weeks. Students who successfully complete the course will be awarded one credit.

#### 3.3.3 Open Electives

The elective courses offered by the departments/ centers/ themes for other department students are called as open electives. These electives are offered to enable students understand interdisciplinary nature of courses. A student's enrollment for pursuing an open elective course(s) is based on his/her choice and order of merit and subject to availability of seats.

Elective courses are spread over four semesters from fourth to seventh semester, to enable students earn credits from a chosen pool or otherwise.

Care should be exercised by the candidate while opting for Open electives and minor courses, such that a course opted as Open elective should not be registered as a course under Minor and vice versa.

In 'electives' category, a student is required to secure a minimum of 33 credits. These credits can be obtained through a combination of courses from his / her own department and other departments.

 Out of 33 credits, 6 credits have to be earned through MOOCs offered via Swayam platform. A student may also be permitted to earn more elective credits through MOOCS. This will promote self-learning and drive students towards innovative learning approaches. To facilitate the process of acquiring the elective credits through MOOCS, VFSTR has constituted "Online course committee" at Central level with 1-2 members represented from each of the department to guide students in selection of courses and to assist them with further steps if required until completion of the courses.

Under the "Creative Work-in-Lieu of a Course" category, students must earn up to 4 credits in place of Departmental Electives (DE) through notable academic and professional achievements such as research paper publications, book chapters, patents, presentations (oral/poster), global certifications, and internships. This initiative encourages creative and holistic exploration of academic and professional avenues, fostering deep exploration of specialized fields. This provision applies between the 4<sup>th</sup> and 8<sup>th</sup> semesters. A range of 1 to 4 credits shall be awarded to the student's based on the significance of contributions. Students can earn credits through a single activity or by accumulating credits from multiple activities. The exact allocation of full or partial credits depends on the student's level of contribution and will be decided by department-level committee chaired by Head of the department.

#### 3.4 Inter-departmental Project

These projects are designed and executed by students during the second and third year of their program in lieu of Field projects. By doing these projects, students will get an idea of how technologies or processes, prototype or working model can be developed by culmination of technologies from courses of different programs / departments. One of objectives identified for successful execution of the project should be of other departmental nature which may influence either process adopted or product developed. The minimum duration of inter-departmental project during the semester is 90 hours including writing of project report and submission for assessment. A batch of 4 students from across or within the departments can take part in the inter-departmental projects. Performance will also be assessed in the modular framework for formative and semester-end summative with a weightage of 1 credit per project.

#### 3.5 Field projects

In lieu of Inter-departmental project, students can enrol for field projects during the second and third year of their program. These projects are intended to emphasize learning through direct experience, allowing students to apply theoretical knowledge in real-world contexts. This hands-on approach provides students with meaningful learning experiences that not only deepen their understanding of academic concepts but also cultivate essential skills and attitudes needed for success in their future careers and as responsible members of society. The minimum duration of field project during the semester is 90 hours including writing of project report and submission for assessment. A batch of 4 students can take part in each project. Performance will also be assessed in the modular framework for formative and semester-end summative with a weightage of 1 credit per project.

Students are recommended to select 'Societal-centric projects' during choosing a problem statement after enrolling either for field project or Inter-departmental project. Research on such problems offers students' a platform to make meaningful contributions to their communities while developing essential skills and ethical awareness. Engaging in these projects help students to become more well-rounded, socially conscious, and professionally prepared engineers.

#### 3.6 Project

Students may opt for Project work in lieu of internship. Such students may avail research -internship support from any institution well known for research and development (R&D). They may also take up project work in VFSTR itself. Each candidate has to submit interim reports and a final report which are mandatory requirements towards the partial fulfillment of project credits requirements. It bears a weightage of 12 credits with a duration of 90 working days. During the semester the student under the guidance of a faculty member(s) will involve in an innovative design / research through the application of his / her knowledge gained in various





courses studied. He / she is therefore expected to present a survey of literature on the topic, work out a project plan and carry it out through experimentation / modelling / simulation / computation. Through such a project work, the student is expected to demonstrate system analysis, design, presentation and execution skills. Students are expected to integrate design component into their project to realize various aspects such as User-Centric Focus, Consistency and Branding, Efficiency and Scalability, Improved Communication, Adaptability and Innovation, Faster Development Cycles, Enhanced User Engagement and Satisfaction etc. Comprehending design component should be documented in the project report by incorporating 'Major Design Experience Information Sheet'. Performance in the project will also be assessed in the modular framework for formative and semester-end summative.

Furthermore, a special provision has been introduced to enable students to undertake fullyear project work, provided they meet the eligibility criteria outlined in Annexure-3. Under this framework, students will complete a 13-credit project in the 7<sup>th</sup> semester, while the 8<sup>th</sup> semester will follow the standard 12-credit project structure. This opportunity allows students to develop deeper expertise in their subject area and enhances their ability to undertake comprehensive research or design-oriented projects.

#### 3.7 Internship

A student can undertake internship in lieu of project work in industry for one complete semester during seventh/ eighth semester in lieu of major project work. If the Internship is under taken during 7<sup>th</sup> semester, then the regular course work of 7<sup>th</sup> semester should be taken up during the 8<sup>th</sup> semester (7<sup>th</sup> and 8<sup>th</sup> semester happen in a swapped mode). It bears a weightage of 12 credits. This is aimed at training students in solving / understanding real-life problems through application of engineering analysis, design, evaluation and creation, particularly in association with practitioners and experts in the industry. The procedures for obtaining the internship placements and allocation of the same to the students are as per University defined norms outlined in the 'internship programme operational guidelines' manual. Even during internship, a student is preferably expected to carry out a focused study on one topic/ problem in consultation with the interning institute. Internship progress report should be submitted periodically and finally a detailed internship report should be submitted duly certified by a mentor from the internship institute. Performance in the internship will also be assessed in the modular framework for formative and semester-end summative.

Furthermore, a special provision has been introduced to enable students to undertake a yearlong internship at industries, provided they meet the eligibility criteria outlined in Annexure-3. Under this framework, students will complete a 13-credit internship in the 7<sup>th</sup> semester, while the 8<sup>th</sup> semester will follow the standard 12-credit internship structure. Students choosing the yearlong industry internship will gain hands-on experience in a professional environment, integrating academic knowledge with industry applications.

#### 3.8 Binary Graded courses

Apart from I<sup>2</sup> courses, following courses shall also be offered as 'Compulsory Binary Grade Courses' with a weightage of 1-credit per course. Courses like the Orientation session (Induction program); Constitution of India; Self-empowerment & Gender Sensitization; Physical fitness, Sports & Games; Life skills; Indian Culture & Heritage; Gerontology; Participation in NCC/NSS/SAC/E-cell/Student Mentoring/Social activities; Stories of Indian Independence; Fix-It Yourself: Home Electronics and Appliance Repair; Universal Human Values; and Indian Knowledge Systems will be offered to students during the first four semesters of the programme. This list is not comprehensive; the institution may add or remove courses based on their relevance and student registrations.

#### 3.8.1 Orientation session (Induction program)

Orientation session is an induction program floated to set a positive tone for the rest of the B.Tech program by helping students feel welcomed, informed, and prepared. This course is intended to play a crucial role in ensuring that students start their engineering education on the right foot, with a clear understanding by organizing activities related to Campus Tour,

Orientation to the Institution, Academic Preparedness, Social Integration, lectures by eminent personalities, Team-Building Activities, Introduction to Student Clubs, Cultural Programs and Recreational Activities.

#### 3.8.2 Physical Fitness

As physical fitness contributes to physical, mental and social development, it is offered as a coursework. Physical Directors and trainers will assist the students for improving physical fitness in regular sessions.

#### 3.8.3 Life Skills

Realizing the VFSTR's Vision of preparing multifaceted personalities, VFSTR floats various credit based life skill activities for students such as yoga, dance, music etc., under the guidance of experienced coaches.

#### 3.8.4 Constitution of India

With an intention to transform students into responsible citizens and professionals, a course on the Constitution of India is offered for B. Tech students to provide a foundational understanding of India's legal framework, governance structure, and fundamental rights and duties.

#### 3.8.5 Self-empowerment & Gender Sensitization

This course aims to foster personal growth, promote gender equality, and create a more inclusive and respectful campus environment. It is designed to equip students with the skills and awareness necessary to navigate and challenge societal norms related to gender, and to empower themselves and their peers.

#### 3.8.6 Universal Human Values

Integrating Universal Human Values course into the B.Tech. curriculum aims to instill a deep understanding of ethical, moral, and human values, fostering holistic development. This course emphasizes the importance of values in personal and professional life, encouraging students to lead a life of integrity, empathy, and respect.

#### 3.8.7 Indian Knowledge Systems

A course on Indian Knowledge Systems (IKS) is designed to provide insights into the rich and diverse heritage of traditional Indian knowledge, encompassing various domains such as science, technology, philosophy, arts, and culture. This course aims to create an appreciation for the indigenous knowledge systems and their relevance in contemporary times

#### 3.8.8 Indian Culture & Heritage

This course explores the rich legacy of India's cultural and historical heritage, offering insights into its art, architecture, traditions, and values. By fostering a deep appreciation for India's legacy, students are encouraged to preserve and celebrate the diversity and wisdom of the nation.

#### 3.8.9 Gerontology

A course on Gerontology introduces students to the social, psychological, and biological aspects of aging. It equips them with the knowledge and sensitivity to address the challenges faced by the elderly, promoting intergenerational understanding and societal support for aging populations.

#### 3.8.10 Fix-It Yourself: Home Electronics and Appliance Repair

This hands-on course empowers students with practical skills in troubleshooting and repairing everyday home electronics and appliances. It promotes self-reliance, sustainability, and an understanding of basic engineering concepts applicable in real-world scenarios.



#### 3.8.11 Stories of Indian Independence

Through a narrative approach, this course immerses students in the inspiring stories and events that shaped India's struggle for independence. It highlights the sacrifices and vision of freedom fighters, instilling a sense of patriotism and respect for India's history.

#### 3.8.12 Participation in NCC/ NSS/ SAC/ E-Cell/ Student Mentoring/ Social Activities

Participation in these co-curricular and extracurricular activities fosters personal growth, leadership, teamwork, and social responsibility. These activities provide students with opportunities to contribute meaningfully to society, develop organizational skills, and enhance their overall personality through community engagement and mentorship.

In case the candidate does not successfully complete the binary graded courses, they will be placed under 'R' category. However, such R should be completed in regular Odd / Even semester whenever these courses are offered. In special cases provision of summer semester may be provided.

#### 4. ATTENDANCE

It is mandatory for the student to attend the course work in each semester as per the academic schedule of that semester. VFSTR expects 100% attendance. However, the attendance in each course shall not be less than 75% of the aggregate of all L, T, P sessions conducted in that course.

- a) The attendance calculations will be periodically reviewed at the end of every 4 weeks. The details of attendance status will be shared with the parents / guardian. The final status of attendance will be reported at end of 15<sup>th</sup> week granting the advantage of the attendance for the 16<sup>th</sup> week for the purpose of attendance shortage calculations.
- b) The shortage of attendance may be condoned up to 10% on the ground of ill-health, social obligations, participating / representing in sports/cultural events, placement activities etc.
- c) Documentary evidence like medical reports and certificates issued by concerned bodies is to be produced on time as support for the attendance shortage due to ill-health. These cases are subjected to the scrutiny of a committee constituted for this purpose by the Vice-Chancellor. The decision of the committee shall be final.
- d) Prior approval has to be taken from the HoDs for the other types of leaves.
- e) The courses where the student shortage of attendance was not condoned shall be considered as 'Repeat' category courses and will be under 'R' grade in the student's semester transcript. Student should re-register for these courses during the summer semester or whenever the course is offered next time during regular semesters. These re-registrations are subjected to the regulations at the time of re-registration. In case of core courses, the same core has got to be re-registered. However, in case of an elective a candidate may exercise a choice of choosing different elective in place of 'R' graded elective.

The students who are put into 'R' grade will not be allowed to take up the L-based summative assessment in that semester. In case due to lack and/or delay in information, if he/she appears for the summative assessment in that course, office of AAA is empowered to cancel the attended assessments. The scores obtained either in formative or summative assessment will not be considered for grading.

#### 5. ASSESSMENT

Teaching-Learning and Assessment should go hand in hand and complement each other. Continuous assessment plays a vital role to enable the student to get synchronized with the teaching-learning process. Assessment mechanism adopted in the institute is aimed at testing the learning outcomes in tune with the outcome based model of education. The focus, is thus on assessing whether the outcomes are realized by the end of the course.

The performance of a student in each course is assessed on a continuous basis during the semester through various in-semester and end-semester assessment models. The marks awarded through continuous assessment are referred to as Formative assessment marks. The marks awarded

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through end-semester tests are referred to as Summative assessment marks (Figure 3). Both the formative and summative assessment marks are considered for awarding the final marks and the grade point in a particular course.





#### 5.1 Marks distribution

For each course, the maximum sum of formative and summative assessment marks put together is 100, in the ratio of 60:40, respectively. Furthermore, the 40 marks allocated for the summative assessment maybe divided between P-based and L-based assessments in a ratio as recommended by the faculty and approved by Dean AAA.

#### 5.2 Qualifying criteria

To be declared successful in a course, a student must secure at least a grade 5.0 in a scale of 10 based on the total maximum marks which is inclusive of formative and summative assessment. The students should also get 50% from the maximum marks allotted for formative assessment and 40% from the maximum marks allotted for summative assessment.

The hierarchy of qualifying criteria is as follows:

- i. Attendance compliance should be 75% or within condonable range; else the candidate is put into 'R' grade.
- ii. In formative assessment, a candidate should secure a minimum of 50% i.e. 30 marks out of 60; else the candidate is put into 'R' grade.
- iii. In summative assessment, a candidate should secure a minimum of 40% i.e. 16 marks out of 40; else the candidate is put into 'l' (Incomplete) grade.
- iv. Collectively the candidate should secure a min. grade of 5.0 in a scale of 10 after relative grading (section 8); else the candidate has to choose either 'R' or 'I' grade duly being counselled.

The candidates with 'R' grade should re-register for 'R' courses either in Summer semester or in a regular semester as and when the courses are offered. The candidates in 'l' grade are allowed to appear for supplementary summative assessment whenever the semester-end assessments are conducted.

To assess Binary graded courses / special projects / courses, not fitting into the categories described here, a suitable assessment procedure will be evolved in consultation with experts of that area and adjudicated by the committee constituted for that purpose. The decision given by the committee will be final. The appended assessment scheme shall be announced by the course coordinator during the commencement of course.

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#### 5.3 L-based courses integrated with P/T

#### 5.3.1 Formative Assessment

The scheme of formative assessment is designed to promote the continuous learning. Scheme consists of assessments planned at institute level and assessment that may be scheduled by the course instructor. Institute level assessments shall be scheduled by the office of AAA. Respective Faculty Member(s) shall declare the schedule of Continuous Laboratory Assessments (CLA), Quiz, Tutorials, Assignments, Seminars, Discussions, etc. Some of the components may also however take place in an unscheduled manner like Surprise Tests. However, students shall be made aware of the assessment modalities that are going to be followed in a course by the faculty, under information to the HoD.

To monitor the progress of students, continuous assessment comprising of six targets (Pre-T1, T1, T2, T3, T4 and T5) is advocated for a maximum of 60 marks. Students in each section are randomly grouped into batches comprising of 3 to 4 members. These batches remain same for all courses and also for the P-sessions in the courses in that semester and are created in the beginning of that semester. The suggestive modality of evaluation of five targets is listed here under:

- a) Pre-T1 shall be conducted once in moulde-1 and twice in module-2 by course instructor as classroom test / assignments. Assignments may cover pre-announced modular bank problems or broad concepts covered during the L-sessions, with a weightage of 10 marks.
- b) Module -1-T1: As outlined in Section 2.2, Module-1 is conducted over a shorter duration, emphasizing the fundamentals and broad perspectives of the course. In tune with this, the assessment could be based on Revised Bloom's Taxonomy Levels 1, 2, and 3, with an emphasis on remembering (recalling), understanding, and applying. To assess these skills, Module-1 T1 will be a paper-based, proctored test conducted for 90 minutes and graded for 30 marks. The question paper will consist of two 5-mark questions and two 10-mark questions. There will be no module bank for this module. The test will be held between the 34<sup>th</sup> and 36<sup>th</sup> days after commencement of the course, typically around the 6<sup>th</sup> week
- c) Module -2-T1: T1 for module-2 commences by the announcement of module bank containing 10 problems covering the course contents of the module. Nature of problems in the module bank shall be at the level of creative / exploratory / design / thought provoking covering the complete syllabus of a module at somewhat advanced / challenging level. The purpose of creating module bank of 10 problems is to assign one problem each to 2 batches of 3 4 members. The purpose of assigning one problem to two batches is to create a healthy competitive spirit between the two batches. During 7<sup>th</sup> week of module-2, T1 consisting of two parts: A and B shall be conducted.

Part A consists of one random problem from the module bank and vary from batch to batch. All the questions in the module bank shall be distributed among students and students shall know the question to be answered only on the day of test in the examination hall.

Part B consists of one common problem at fairly application/ advanced level (not at all prior notified) from outside the module bank for all the students.

T1 shall be paper based and proctored test for a period of 90 min (maximum) which shall be assessed for 20 marks.

For the students who for justifiable reasons could not attend the classroom test on the scheduled day, a re-test maybe conducted. However, Part-B will contain a new question and Part-B will have higher weightage than part-A or full weightage could even be allotted for Part-B in such an event.

d) **T2:** Immediately follows Module -2-T1. Students in a specified batch who now have received the same question during T1 will work further on that problem for T2.

T2 is primarily an extension of problem received in T1 for carrying out validation study: Case studies / Simulations / Experimentation. Each batch shall interact with the course instructor to finalize the nature of validation and expected to complete the exercise within 10 to 12 days after T1.

Course instructor should ensure assigning a different case study / a different scope for validation study for each batch in case the same problem is assigned to two batches.

Course instructor shall assess every student in a batch for a max. of 10 marks based on his observation, interaction and/or reviewing (based on at least two reviews).

e) T3: T3 shall be conducted during the last week of each module. Student batches are expected to submit a report, clearly documenting the work executed during T2. The report should be in IEEE / APA format and additionally a voice in-built PPT should be prepared and submitted.

The report and presentation shall be assessed by the course instructor for 10 marks for every student. In certain cases, a course instructor can call for a physical presentation also by a batch.

f) T4: T4 is a comprehensive test covering contents of both the modules conducted for 30 min. comprising of 40 multiple choice questions (MCQs) covering the holistic content of both the modules. T4 shall be evaluated for a max. of 20 marks @ ½ mark for each question. T4 will be conducted in ON-LINE mode.

When the test is administered online, every student receives the questions in shuffled sequence and also the choices in shuffled sequence. Therefore, the choice like both 'a' & 'b' above. Neither 'a' nor 'b', all the three a, b, c will not be set.

- g) T5: T5 assessment is based on Practice or Tutorial assignments. Implementation, Report presentation and Discussion shall happen in a continuous mode throughout the module period. At least 4 such continuous lab practice assessments (CLPA) / assignments per module shall be conducted by course instructor. The marks will be @ 5 marks per assignment.
- h) The scores of the targets are to be normally announced within three working days on completion of the assessment and the performance is to be discussed in the class.
- i) The total marks for module-1 is 50 Pre-T1 (10), T1 (30) and T5 (10)
- j) The total marks for module-2 is 70 Pre-T1 (10), T1 (20), T2 (5), T3 (5), T4 (10) and T5 (20).
- k) The total marks from formative assessments for both modules will be added up to 120. These absolute scores will first be scaled down to a max. of 60 marks. The lead instructor, in consultation with the HoD, will review the scaled-down marks and determine a suitable mapping. The finalized mapping approach must be shared with Dean AAA for documentation.
- I) The marks scored in Module-1 should be entered / submitted latest by 7<sup>th</sup> week and of Module-2 latest by 16<sup>th</sup> week of the semester. The consolidated score (max. of 120), after scaling down and suitable mapping to a maximum of 60 marks, must be submitted by the 18<sup>th</sup> week to facilitate the declaration of the formative 'R'-grade before the commencement of the L-based summative assessment.
- m) A candidate placed under 'R' will not be permitted to take up the L-based summative assessment.

#### 5.3.2 Summative Assessment

Summative assessment activities including timetables, question paper model, duration of the examinations will be informed to the students well before the commencement of the examinations in the form of circulars from Dean-AAA's office.

a. Unless specified otherwise one of the following formats may be used for summative assessment for L-based courses integrated with T/P.



- i. 15 (P) + 25 (L) marks format (L+P or L+T+P courses).
- ii. 20 (P) + 20 (L) marks format
- iii. 40 marks format (L+T courses).
- b. If summative assessment is in two parts format:
  - i. Part-I will be the assessment of the capstone project, which is pre-assigned during the module-2 period, or will be the exploratory review assessment of all lab practice assignments. This summative assessment activity may be completed during the 15<sup>th</sup> week after the start of the semester, at the end of the formative assessment.
  - ii. Part-II will be based on a written examination for a max. marks of 60, as in c & d below, which is **scaled down** to 25.
  - iii. A candidate should attend both the parts of summative assessments; else he will be put into I grade.
- c. For each L-based course integrated with T/P, the summative assessment shall be conducted by the Institute for a duration of 150 min. and for a maximum of 60 marks. Contents for summative assessment shall cover the breadth and depth of the complete syllabus that is mentioned in the two modules of a course.
- d. The question paper for end-semester theory examination consists of two parts as given in Table (3).

Part No.	No. of Questions	Marks for each Question	Marks	Choice
А	4	8	32	No
В	2	14	28	No
	60			

 Table 3: L-based Summative Assessment Question Paper Pattern.

- e. The questions will be comprehensive covering the entire course syllabus and any single question should not necessarily be limited to any particular unit / module.
- f. These marks are suitably mapped down to a score of 40.
- g. Total marks of summative assessment will be for a max. of 40 irrespective of format of evaluation.
- h. The award of 'l' grade is solely based on marks scored in summative assessment out of 40, if he/she does not score a min. 16 out of 40 (40%).

#### 5.4 P based Courses

The detailed information consisting of experiments, batch formations, experiment schedules, etc., will be displayed / informed to the student in the first week of the semester so that the student comes prepared for the lab sessions. Copies of the lab manual will be made available to the students along with the schedule. The lab manual will consist of the list of equipment's, detailed procedure to conduct the experiment, format for record writing, outcomes for each experiment and possible set of short questions to help students gain critical understanding. The courses like IT Tools & Cyber security, Engineering Graphics, Design Thinking & Engineering will also be treated as P-based courses.

#### 5.4.1 Formative Assessment

During laboratory sessions, a brief viva-voce is conducted for each student on the experiment he/she is carrying out on that day. Some of the parameters that could be included in the Continuous Lab Practice Assessment (CLPA) are given in Table (4). The set of parameters may slightly differ from one laboratory to the other, and will be announced before the commencement of the lab session. These parameters are assessed for each laboratory session.

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S. No	Component	Marks					
1	Report of about 1 page on proposed experimental layout and background theory before the start of lab session	4					
2	Viva and interaction to evaluate understanding of concepts						
3	Experimentation and data collection	4					
4	Analysis of experimental data and interpretation	4					
5	Finalized report submitted in the next week	4					
	Total						

 Table 4: Suggested parameters for Lab Practice Assessment (CLPA)

Each practice session is assessed for a total of 20 marks. The cumulative scores from all sessions will be **suitably mapped down** to a max. of 60 marks, with Module-1 contributing 25 marks and Module-2 contributing 35 marks toward the consolidated formative assessment.

#### 5.4.2 Summative Assessment

End semester examination for each practical course is conducted jointly by two examiners. The end-semester examination for each practical course is conducted jointly by two examiners. The panel of examiners is constituted by the respective School Dean. The internal examiner is the faculty member who has conducted all practical sessions and associated activities throughout the semester. The external examiner is nominated from within the department and is familiar with the course's practical components but has not been directly involved in its delivery. The scheme of assessment may vary depending on the nature of the laboratory, which shall be shared with student by the laboratory in-charge. The summative assessment will be conducted for a max. marks of 40. The general scheme of assessment is given in Table (5).

	Marks				
Component	Examiner 1	Examiner 2	Total		
Objective & Procedure write up including outcomes	4	4	08		
Experimentation and data collection	4	4	08		
Computation of results	4	4	08		
Analysis of results and Interpretation	4	4	08		
Viva Voce	0	8	08		
Total Marks	16	24	40		

Table 5: Suggested end-semester summative assessment pattern for P-based courses.

#### 5.5 Assessment and Grading of MOOCs based elective

Whenever a candidate opts for a course through MOOCS offered via Swayam platform, he / she has to learn and undergo assessment as per norms set by VFSTR for such MOOCs Courses. Upon the declaration of the result, that the candidate has successfully completed the course, the candidate is said to have earned the credits under credit equivalence and credit transfer.

#### 5.6 Inter-departmental Project / Field Projects / Societal-Centric Projects

Inter departmental project / Field Projects / Societal-Centric Project work is undertaken in the even semester of II and III-year of programme for earning 1 credit per project by each candidate. It is expected that these inter-departmental projects result in publication of a technical paper in a peer-reviewed journal / top-notch conference. For this purpose, Heads of Department will identify and appoint faculty mentors who offer technical expertise/ guidance to students for defining clear, achievable objectives and milestones for their projects



#### 5.6.1 Formative Assessment

The assessment will be carried in a systematic way wherein first review is conducted during module-1 and second review during module-2 period. The detailed assessment guidelines and scheme are to be announced along with the assessment schedule as mentioned in the Table (6).

Table 6: Schedu	ule and parameters	s followed for formative	assessment.

Module	Schedule	Review	Points to be considered	Formative assessment marks
Module -1	5 <sup>th</sup> – 6 <sup>th</sup> week	Review -1	<ul> <li>Identification of specific area out of broad areas under the supervisor</li> <li>Identification of outcomes in line with programme objectives.</li> <li>Identification of tools / equipment / surveys / training needs / etc.</li> <li>Completion of literature survey</li> <li>Readiness of about 25% documentation</li> </ul>	30
Module - 2	Nodule - 2 $14^{th} - 15^{th}$ Review -2		<ul> <li>Presentation of results, analyses and conclusions</li> <li>Meeting of objectives defined in first review</li> <li>Preparation of report</li> <li>Understanding by individual students on the overall project</li> </ul>	30

#### 5.6.2 Summative Assessment

Summative assessment will be done jointly by two examiners (both from VFSTR) wherein one as internal examiner and the other as external examiner. These examiners will be appointed by School Dean from the panel of examiners suggested by the respective Head of the Department. The scheme of assessment will be report (15 marks), presentation (10 marks) and demonstration (15 marks) respectively. Points to be considered during the review.

- a. Presentation of results, analyses and conclusions
- b. Meeting of objectives defined in first review
- c. Preparation of report
- d. Understanding by individual students on the overall project
- e. Individual student contribution

#### 5.7 Project

Those students who do not opt for the semester-long internship, carry out their major project at VFSTR and submit their report which is a mandatory requirement for the award of degree. These projects are usually done in batches (not exceeding five students in a batch), during the VIII semester, under the guidance of a faculty member. Every batch, in consultation with the guide, should define the project and also the probable procedure of carrying it out and submit the same to a committee consisting of 2 to 3 faculty members appointed by Head of the Department. This is to avoid the repetition and also to come up with a roadmap for completion of the project within the time stipulated. The students are encouraged to select

topics related to ongoing research and consultancy projects. The students are expected to carry out and present a survey of literature on the topic, work out a project plan and its implementation through experimentation / modelling / simulation / computation. They are also expected to exhibit system analysis, design, and presentation and evaluation skills. The entire process of grouping of student batches, and identification of respective guides etc., is to be completed by the end of VII semester, so that students can start of their project work immediately after VII semester.

#### 5.7.1 Formative Assessment

The progress of project is reviewed twice in a module by the Project Review Committee (PRC) and formative assessment marks are awarded based on these reviews. The Project review committee consists of

- a) Head of Department or his/her nominee Chairperson
- b) A senior faculty member identified by the HoD member
- c) Project supervisor member

Review schedules of PRC are to be announced by the department immediately after the commencement of class work. The review presentations are open to all the students of that section and attendance is compulsory. The first review should be of 15 minutes / batch; the remaining reviews should be around 30 minutes / batch. Before every review the batches should submit their PPT along with a brief report of not exceeding two pages. It is to be expected by the committee that student communicates/publishes research article based on the project work prior to graduation. The following aspects may be considered by the committee for assessment Table (7).

Table 7: Schedule and suggested p	parameters to	be considered	for formative	assessment.
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Module	Schedule	Review	Points to be considered	Max. Marks
Module -1	4 <sup>th</sup> week	First review	<ul> <li>Identification of specific area out of broad areas.</li> <li>Identification of outcomes in line with programme objectives</li> <li>Feasibility of contributing to the attainment of outcomes</li> <li>Awareness on components mentioned in Project Experience Information sheet</li> </ul>	20
	12 <sup>th</sup> week	Second review	<ul> <li>Acquisition / learning of the tool required</li> <li>Readiness of the layout of the project report</li> <li>Progress review as per mechanism/ schedule identified</li> <li>Individual student contribution in above activities</li> </ul>	20
Module – 2	ule – 2 16 <sup>th</sup> week Third review		<ul> <li>Presentation of results and conclusions</li> <li>Meeting of objectives defined in first review</li> <li>Submission of draft report</li> <li>Understanding by individual students on the overall project</li> <li>Individual student contribution</li> <li>Progress of project as per schedule</li> </ul>	20

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#### 5.7.2 Summative Assessment

At the end of the semester, during  $18^{th}$  to  $20^{th}$  week of the semester the summative assessment will be conducted in two phases.

Phase–I (during 18<sup>th</sup> -19<sup>th</sup> week): This is an evaluation for a max of 20 marks. A committee of two members comprising of HoD's nominee and Guide will assess the project work which will involve going through the project report (6 marks), project presentation (7 marks) and demonstration of the project (7 marks).

Phase–II (during 20<sup>th</sup> week): A final presentation and defense assessment for a max. of 20 marks will be carried out by one-man committee composed of an external expert who is chosen by the Dean AAA from a panel of examiners suggested by the HoD. The format for evaluation will involve going through the project report's quality (6 marks), presentation (6 marks) and interaction and defense (8 marks).

The qualifying marks will be finalized considering the marks scored in both the phases (I & II) of summative assessment.

In case the candidate is placed in 'I' grade, he/she has to appear for both Phase-I and Phase-II assessments, which will be held within the 15 days after declaration of results. In the consecutive assessment also if the candidate fails to secure min. required score then he/ she will be placed in 'R' grade.

#### 5.8 Semester-long Internship

Internship work is undertaken either in the VII or VIII semester by a student in an industry, under the joint supervision of industry personnel and an internal faculty member. Sixty percentage of the marks of Internship are allotted through continuous evaluation as formative assessment and the remaining 40% are based on end semester assessment

Module	Review	Schedule	Formative assessment marks
Module - 1	First review	4 <sup>th</sup> week	20
Madula 2	Second review	12 <sup>th</sup> week	20
wodule - 2	Third review	16 <sup>th</sup> week	20
	Total		60

Table 8: Assessment scheme for Internship reviews.

- a) The progress of internship work is reviewed twice in every module by the "Internship Review Committee" and marks for formative assessment are awarded based on these reviews.
- b) The Internship Review Committee (IRC) consists of Head of Department or his/her nominee (Chairperson), the internal and external (industry) supervisors.
- c) The IRC may not be the same for all students; however, the same IRC should exist for entire duration of the internship program of any single student.
- d) The schedule and the scheme of evaluation are to be announced with internship notification. The internship reviews may take place at the place of internship or at the university, as decided by the interning organization or may be conducted in the blended mode.

#### 5.8.1 Formative assessment: Internal reviews at the place of internship

The internal supervisor will interact with the guide allotted at internship offering industry based on the schedule given to conduct the reviews. Scheduled reviews can be conducted by IRC on online mode for discussion/ presentation. The 20 marks obtained by students for each review will be scaled to allotted marks as given in Table (9).

a) Students should submit a report (not more than two pages) explaining about the progress of their work, mentioning clearly details like the machines or software handled / adopted, type of data collected and his/her understanding and contribution in the programme, and the same has to be presented before the supervisors.

- b) The candidate should clearly present the completion of stipulated assignments set by the industry supervisor for that period.
- c) The evaluation will be based on a & b above and also based on regularity and discipline maintained in the internship venue.

Table 9: Suggested scheme of assessment for every review

Component	Total
Regularity and interaction	5
Application of knowledge	3
Gaining of new knowledge /skills / literature survey	5
Internship progress	4
Report	3
Total marks	20

#### 5.8.2 Summative assessment – Internship

At the end of the semester, the student shall submit a comprehensive report of internship covering the work done and make a final presentation in two phases as follows:

Phase–I (during 18<sup>th</sup> - 19<sup>th</sup> week): A committee of two members comprising of internal supervisor and HoD's nominee will assess the overall internship participation by the candidate and his final report through presentation made by the intern. The internship report (6 marks), presentation (7 marks) and overall impression (7 marks) during the internship will be evaluated respectively.

Phase–II (during 20<sup>th</sup> week): A final presentation and defense assessment for a max. of 20 marks will be carried out by one-man committee composed of an external expert who is chosen by the Dean AAA from a panel of examiners suggested by the HoD. The format for evaluation will involve going through the project report's quality (6 marks), presentation (6 marks) and interaction and defense (8 marks).

The qualifying marks will be finalized considering the marks scored in both the phases (I & II) of summative assessment.

In case the candidate is placed in 'l' grade, he / she has to appear for both Phase-I and Phase-II assessments, which will be held within the 15 days after declaration of results. In the consecutive assessment also if the candidate fails to secure min. required score then he/ she will be placed in 'R' grade.

#### 5.9 Binary graded courses

Binary graded courses aim to simplify the grading process and encourage students to focus on learning and achieving the mastery rather than the pursuit of specific grades. Students will enroll in these 1-credit courses during the I, II and III semesters of programme. Unlike traditional grading systems, binary graded courses offer only two possible outcomes i.e., Pass grade / R-grade. To obtain Pass grade, a candidate should maintain 75% of attendance and secure a minimum of 50% score (i.e. 50 marks out of 100) in each course; else the candidate shall be placed into 'R'-grade. There shall not be any summative assessment activity for Binary graded courses.

#### 5.9.1 Formative assessment

The assessment will be carried in a systematic way wherein two reviews per module shall be conducted as mentioned in the Table (10).



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Module	Review	Formative assessment marks
Madula 1	Activity - 1	20
Wodule - I	Activity - 2	20
Madula 2	Activity - 1	30
Wodule -2	Activity - 2	30

#### 5.10 Pre-Semester Courses

The pre-semester program is a structured six-week initiative designed to assess and strengthen students' foundational skills before the commencement of regular coursework. This program consists of two binary-graded courses and four additional gradial category courses, including Mathematics, English, Aptitude & Logical reasoning and IT Tools. All courses under this program will have 100% weightage assigned towards formative assessment, ensuring continuous engagement and skill development without summative assessments. To secure a passing grade, students must maintain a minimum of 75% attendance in each course and obtain at least 50% in the assessment. Those unable to meet either criterion will be assigned an R-grade and must complete the course on a priority basis, either with the immediate subsequent batch or within the first academic year. The assessment will be carried in a systematic way as mentioned in the Table (10).

#### 5.11 Creative Work-in-Lieu of a Courses:

The "Creative Work-in-Lieu of a Course" initiative aims to foster a culture of *creative exploration, holistic learning, and deep engagement* with academic and professional pursuits. By integrating diverse activities such as research, innovation, global certifications, and advanced internships, this program empowers students to achieve excellence beyond traditional coursework. The structured assessment ensures that each contribution is recognized fairly, promoting a transformative educational experience that aligns with global academic and industry standards. This provision applies between the 4<sup>th</sup> and 8<sup>th</sup> semesters. Credits for various academic activities shall be awarded based on individual contributions ranging from 1 to 4 credits. For each category of achievement, credits may be awarded as specified in Table 11.

Categories	First Author / Sole Author	Co-Author (Max. 4 B.Tech. students)
SCI / SCI-E - Q1 & Q2	5	4.5
SCI / SCI-E - Q3 & Q4	4	3.5
Scopus / E-SCI	3.5	3
Book Chapter / Top-notch Conference publications (Scopus / SCI indexed)	3	2.5
Idea Patent Grant	3	2
Utility Patent Publication / Grant	3 / 4	2/3
Paper / Poster Presentations & Working Models in the top 100 NIRF rankings institutes (excluding VFSTR)	1	0
Prizes - Paper / Poster Presentations & Working Models in the top 100 NIRF rankings institutes (excluding VFSTR)	2	0
Global certifications	4	0
Special Internships (Govt. sponsored / BIRAC SITARE/ IITs/ IISc/)	2	0

Table 11: Credit Allocation for Different Achievement Categories

In the case of paper publications, credits shall be granted only for papers published online or with volume and page numbers. Students must submit the manuscript's initial version, review reports, responses, and the final published version for credit defense.

If credits fall short, the deficit can be addressed by reading advanced research papers under a mentor's guidance, with individual assessments conducted by the mentor. Manuscripts under review may also be considered for credit allocation. Students unable to publish by the end of 4(1) must earn credits through advanced-level NPTEL courses in 4(2).

Collaborative publications involving students from different departments are treated as sole authorship, with equal credits awarded to contributors. Surplus credits beyond the 4-credit limit are categorized as Add-on Credits and linked to Honours or Minor degree requirements.

Ethical practices must be upheld in all activities, and any shortcuts or unethical behaviour are strictly prohibited. A committee, chaired by the Head of the Department and comprising four members— the School Dean, counsellor, one senior faculty member, and a representative from the Board of Research & Development (BoR)— shall oversee students' academic achievements to finalize and authorize credit transfer details and communicate them to the Office of Dean AAA.

#### 6. SEMESTER-END ASSESSMENT ACTIVITIES

- 6.1 Setting of semester-end summative assessment question papers will be coordinated by the lead instructor assigned for a particular course. Two sets of question papers will be submitted latest by 12<sup>th</sup> week of the semester.
- 6.2 There shall be 'Summative Assessment Question Paper Scrutiny Committee' which would be constituted with external experts. Experts are empowered to modify / rephrase the questions to maintain a high standard of the semester-end assessment. The review should be completed by the 14<sup>th</sup> week of the semester. The review process will be coordinated by a committee of School Dean, HoDs and external experts.
- 6.3 The question wise marks scored in the summative assessment out of a total of 60 will be made available online within two weeks from the last date of examination and would be kept active for 24 hours. Latest by the end of 48 hours from the instant of notification any candidate can submit an appeal online providing question wise claim.
- 6.4 Claims for re-assessment on P-based courses are not allowed.
- 6.5 The appeals will be attended within next three working days. Fees for appeal, as decided from time to time, has to be remitted online along with the appeal.
- 6.6 Final results and grades will be computed as explained in the next section.
- 6.7 Final results and grades shall be announced within four weeks of completion of the last examination of the summative assessment (within two weeks from the last date of appeal). Grades are published on the University website, and also informed to the parents and students through SMS.
- 6.8 Provisional Grade cards will be issued within two weeks after the announcement of grades. Grade card will contain three parts. Part 1: Details of successfully completed courses. Part 2: Details of 'l' grade courses. Part 3: Details of 'R' grade courses.

#### 7. GRADING POLICY

To ensure fair and context-sensitive assessment of student performance, a **Bilateral Relative Grading System** shall be adopted for all credit-based courses. This system permits the possibility of upward scaling, downward scaling, or retention of absolute scores, based on a holistic analysis of marks distribution, course complexity, assessment deign, and class performance. The decision regarding the direction and extent of scaling shall be made by a committee duly appointed by the Honourable Vice-Chancellor.

The grading for each course shall be finalized by the committee, ensuring that the influence of outlier scored is minimized while accurately representing the performance of the major cohort. This method supports equitable grade interpretation across diverse course deliveries and upholds the integrity of the assessment process.

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#### 8. COMPUTATION OF GRADING

- 8.1 Formative assessment decides the list of 'R'- candidates. Therefore, these candidates will not be considered for grading computation. Summative assessments decide the list of 'I' candidates. Therefore, these candidates will not be considered for grading computation.
- 8.2 The candidates who have successfully completed both formative and summative assessments will be considered for computation of relative grading.
- 8.3 Threshold value **(Th)** for relative grading in each course is arrived after studying the marks distribution in that course by a committee constituted by office of Dean AAA. The threshold value is decided by the upper bound marks of the major chunk of the class keeping the top outlier scores away from consideration (the least upper bound). The threshold value will be slightly greater than upper bound marks or may be equal to the upper bound marks.
- 8.4 The total marks (m) = marks scored in the formative assessment + marks scored in the summative assessment is transformed into relative grade expressed accurate to two decimal places as follows:

#### Relative grade point (P) = (m/Th) X 10 [and limited to 10]

8.5 If students require course wise percentage equivalence, then the calculation will be based on the following

#### Course wise percentage equivalence = (m/Th) X100

#### [truncated to two-digit integer and limited to 100]

8.6 After relative grading, a student is assigned a 'Letter Grade (G)' for each course as per Table (12). The grade and the corresponding letter grade represent the outcomes and assessments of a student's performance in a course.

Table 12: Grading information	n
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Relative Grading Range (P)	Category	Grade (G)
≥ 9.50	Outstanding	0
≥ 9.00 to 9.49	Excellent	S
≥ 8.00 to 8.99	Very good	A+
≥ 7.00 to 7.99	Good	A
≥ 6.00 to 6.99	Fair	В
≥ 5.00 to 5.99	Marginal	С
Transitional Grade	Repeat	R
Transitional Grade	Incomplete	I

#### 9. SUPPLEMENTARY EXAMINATIONS

- 9.1 The supplementary examinations shall be conducted once in summer semester. Notifications will be released by the examination section informing the students about registration procedures, details of fee and timetables. Apart from these examinations the students who have courses with 'l'-grade can also write the supplementary examinations along with regular semester-end examinations of that academic (Odd / Even) semester.
- 9.2 Whenever a candidate clears courses with 'l' grade in a supplementary examination that are conducted during a regular semester, the Threshold value for computing his / her grade will be obtained from the same batch in which he / she had completed his/her formative assessment.
- 9.3 Whenever a candidate clears courses with 'R' / 'I' grade in a summer semester, the Threshold value for computing his / her grade will be carry forwarded from the preceding Odd / Even semester for the respective courses.

- 9.4 Whenever a candidate clears courses with a 'R' grade in a regular semester along with his/ her junior batch then for this candidate the Threshold value will be corresponding to his/her junior batch for computing grade.
- 9.5 The results of summative assessment of Project / Internship will be announced only if the candidate successfully earns all the credits in courses registered during the program. If the candidate is with 'R' / 'I' graded courses the results will be kept under '**Announced Later (L)**' status and will be announced only after candidate clears these courses.

#### **10. GRADE POINT AVERAGE**

The Academic Performance of a student in every semester is indicated by the Semester Grade Point Average (SGPA) and finally by Cumulative Grade Point Average (CGPA).

#### 10.1 SGPA

The Semester Grade Point Average (SGPA) shall be computed using the formula given below:

$$SGPA = \frac{\sum_{i=1}^{n} C_i P_i}{\sum_{i=1}^{n} C_i}$$

Where

n = number of courses a student successfully completed in the semester under consideration

P<sub>i</sub> = Grade points secured for the ith course registered in the semester under consideration.

C<sub>i</sub> = the number of credits assigned to ith course registered in the semester under consideration

#### 10.2 CGPA

The Cumulative Grade Point Average (CGPA) shall be computed after successful completion of the programme. The CGPA shall be expressed in different flavours to reflect B.Tech. of 160+10 credits, B.Tech. with Research Honours of 176 credits, and different Add-on provisions up to 16 credits leading to Minor / Add-on Diploma/ Add-on certification.

Accordingly, the computations will be as below:

$$CGPA = \frac{\sum_{j=1}^{m} C_j P_j}{\sum_{j=1}^{m} C_j}$$

Where

m = total number of courses prescribed for the completion of the programme

 $P_i$  = grade points secured for the j<sup>th</sup> course.

 $\mathbf{C}_{_{i}}$  = the number of credits assigned to  $j^{\text{th}}$  course

#### 11. AWARD OF CLASS

The students who have become eligible for award of degree shall be classified based on their CGPA secured, as per the Table (13) given below:

SI. No.	CGPA	Class / Division
1	8.0 and above	First Class with Distinction
2	6.5 and above but less than 8.0	First Class
3	6.0 and above but less than 6.5	Second Class
4	5.0 and above but less than 6.0	Pass class
5	Less than 5.0	No class

Table 13: Class / Division information.



- a) For the purpose of rewarding the accomplishers with ranks and awards, toppers in each branch discipline are identified, based on their academic performance (CGPA).
- b) In addition, the 'Chairman's gold medal' and other 'Endowment Awards' are awarded to the 'outstanding students' based on the overall performance which includes academic, cocurricular and extra-curricular activities, campus placements and competitive examinations. A committee appointed by the Vice-Chancellor will recommend the eligible student for the award, selected from the nominations received from the departments.
- c) In addition, the institution may recognize exceptional performance such as music, dance, sports etc. and display of exceptional bravery from time to time.
- d) Only such candidates who complete 160 +10 credits (+16 credits) in the first 8 successive semesters shall be eligible to receive awards/ ranks.
- e) The candidates availing spill over semesters will not be eligible for the award of merit scholarships.

#### 12. AWARD OF DEGREE

On successful completion of prescribed requirements of the programme, the degree shall be conferred during the convocation of the VFSTR.

For the conferment of degree, the student has to fulfill the following requirements:

- a) a bonafide student and undergone the course work of not less than four academic years and not more than seven academic years from the date of joining.
- b) successfully completed all the courses as prescribed in the respective curriculum.
- c) acquired a minimum eligible credits i.e. 160+10 credits for the award of B.Tech. degree.
- d) obtained no due certificates as prescribed by VFSTR.
- e) no in-disciplinary proceedings pending against him / her.

Consequent upon being convinced, following an enquiry, the Academic council may resolve to withdraw the degree / diploma / any other certification provided by the institute. The aggrieved may however prefer for a review of such decision by the Academic Council, citing cogent reasons for review or go in for an appeal to the, Executive Council of the institute.

#### 13. LATERAL ENTRY AND LATERAL EXIT OPTIONS

#### 13.1 Lateral Entry into II year of B.Tech.

The students who have completed their diploma programme in recognized institutes can be admitted into the third semester of the undergraduate programme. The committee constituted by Vice-Chancellor, will establish the eligibility of admission into different branches offered by VFSTR. The committee may recommend additional courses to be studied by the candidate, which students will complete during their first year of study at VFTSR however subject to a maximum of 25 credits per semester. To earn B.Tech. degree the student has to earn the same number of credits specified for regular B.Tech. in their 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year of study. The student is eligible to register for Add-on credits as presented in section (1.5).

#### 13.2 Inter-Institutional Credit Transfer

Students pursuing an undergraduate programme in other recognized Higher Education Institute (HEI) could be admitted into VFSTR without appearing for the entrance exam to continue their studies, subject to the approval by a committee constituted by Vice-Chancellor. In this case, the student shall furnish the transcripts or grade cards, syllabus copies, educational certificates, and other relevant documents while applying for admission. The committee constituted by Vice-Chancellor, will establish the equivalency based on the marks / credits obtained in the courses in the previous institute by following the Inter- Institutional Credit Transfer policy.

#### 13.3 Honorable exit with B.Sc. or Engineering Diploma

In line with NEP-2020, an optional exit is provided for a candidate who has earned a min. of 120 credits and has completed all the requirements up to the end of six semesters.

B.Sc. degree / Engineering Diploma will be awarded in respective branches of specialization. Candidates opted to exit with Engineering Diploma will also be awarded with B.Sc. equivalence certificate in case of disciplines existing in the University system.

In case the candidate fails to earn 120 credits, a suitable certification will be awarded during his / her exit from B.Tech. degree.

Semester-wise transcript and a consolidated transcript will be given to the candidates during their exit from the registered program.

Such a candidate who has exited can seek re-entry to complete B.Tech. by surrendering the B.Sc. Degree / Engineering Diploma. A committee constituted by Vice-Chancellor will scrutiny all such re-entry requests and recommend the plan of action. However, the max. duration of programme should be limited to seven years and further extension beyond the stipulated max. duration of study has to be approved by Academic Council, if the candidate appeals for an extension.

#### 13.4 Volunteer 'Drop' and Sabbatical Semester option

A candidate may exercise his option to voluntarily exit from B.Tech. programme temporarily for a semester during the B.Tech. programme, by registering for a 'DROP option' in the beginning of the semester. The DROP can also be exercised to take up special Internship / Innovation / Exploratory / Entrepreneurship / Advanced research / Start-up and such related activities. Under such circumstances a candidate can normally avail DROP over two successive semesters. Such 'Drop' semester will be identified as Sabbatical semesters.

Such a candidate has to pay the regular semester fee if such a Drop option is utilized during the first 8 semesters of B.Tech., and has to pay a nominal semester maintenance fee during the spill over period, if a candidate has not yet completed the credit requirements.

Upon returning from such a temporary exit, a candidate may continue his B.Tech. studies utilizing the provision of spill over period. A candidate may also submit a claim for Credit equivalence for the activities undertaken during the sabbatical period. The equivalence committee would evaluate and assess the academic equivalence of the work carried out and would recommend the credit equivalence and credit transfer to be granted together with the grades that could be attributed, if applicable. However, the max. duration of programme should be limited to seven years and further extension beyond the stipulated max. duration of study has to be approved by Academic Council, if the candidate appeals for an extension.

#### 13.5 Volunteer 'Drop' with Semester Drop option

A candidate may exercise his option to voluntarily exit from B.Tech. programme temporarily for a semester during the B.Tech. programme, by registering for a 'DROP option' in the beginning of the semester to meet the family / personal exigencies. All the norms as mentioned in the section (13.4) shall be applicable for the candidates utilizing semester drop option.

#### **14. CHANGE OF BRANCH DISCIPLINE**

The students can request for change of branch after completing the first two semesters of study. These requests are considered subject to the following conditions:

- a) Top one percent of the students in each branch based on CGPA at the end of the second semester are eligible for a change of branch.
- b) The seats must be available in the branch to which a student intends to change.
- c) The student opting for a change should have completed all the credit requirements of the first two semesters.





- d) The percentage of scholarship awarded at the time of admission may or may not be transferred in the case of a branch change and is subject to the availability of seats in the new branch.
- e) The decision of the Institution is final in this regard.

All the above points are applicable for branch change cases based on the merit criterion. There may be branch change requests of another kind, from the students who are not able to cope up with the studies of the branch they are admitted into. All such requests are to be referred to a committee constituted for the purpose. The committee takes the decision based on the merit of each case, the availability of seats and various other factors. The decision of the committee in this regard is final. Because there may be a difference of one or two courses in the first year curriculum among different specializations, when the student changes his specialization after completing first year, he / she is required to complete those first year courses of the new specialization which were not studied by him/her during the first year, which can be taken up in the immediate summer semester.

#### 15. PROVISION FOR PURSUING TWO ACADEMIC PROGRAMS SIMULTANEOUSLY

In line with NEP-2020, R-25 regulations at VFSTR allow B.Tech students to enroll in two academic programs simultaneously without compromising the requirements of their primary degree. This provision is subject to UGC and AICTE approvals. It enables academically proficient students to pursue an additional degree, diploma, or certification while fulfilling the credit and course requirements of their B.Tech curriculum. The regulations ensure scheduling flexibility and academic monitoring to help students effectively balance both programs. To maintain the academic integrity of the primary degree, students must meet the eligibility criteria specified in the regulations and demonstrate consistent performance. A candidate who desires to avail the benefit of pursuing two academic programs cannot register for Minors, Honours, or an Add-on Diploma. By utilizing this opportunity, students can gain interdisciplinary expertise, enhance their career prospects, and align their education with evolving industry and research demands.

#### **16. INTERPRETATION OF RULES**

- a) The academic rules and regulations should be read as a whole for the purpose of any interpretation.
- b) For the matter(s) NOT covered herein above or for unforeseen circumstances, but arising during the course of the implementation of the above regulations. The Vice-Chancellor shall be authorized to remove the difficulties and decide upon the matters. The same shall be reported in the next meeting of Academic Council for ratification and subsequently informed to Executive Council.
- c) The Institution may change or amend the academic rules and regulations or curriculum at any time, and the changes or amendments made shall be applicable to all the students with effect from the dates, notified by the Institution.
- d) Procedure and explanation to any section can be floated by the office of Dean AAA as applicable from time to time with due approval by the Chairman of Academic Council.

### ANNEXURE -1

### SUPPLEMENT REGULATION FOR PURSUING B.TECH. UNDER ACCELERATED LEARNING PROGRAM

A candidate willing to complete the B.Tech. program within an accelerated timeline of three-and-a-half years should meet the following terms and conditions:

- 1. He/she should maintain a minimum CGPA of 8.5 up to the end of the 4<sup>th</sup> semester (II-year Even semester).
- He/she should have successfully completed all credit requirements up to the end of the 4<sup>th</sup> semester without any 'R' or 'I' - grades.
- The candidate should submit a formal application to the Office of the Dean AAA during the Module-2 period of III year – Odd semester (5<sup>th</sup> Semester) expressing intent to opt for the accelerated learning program.
- 4. The candidate should appear for an eligibility assessment (aptitude test/interaction) conducted by a committee of experts constituted for this purpose, and the committee must recommend his/her name for the program.
- As per R25 regulations, each student must earn 4 credits under 'Work-in-Lieu of a Course'. Candidates must demonstrate their capability of earning these credits at the time of submitting their intent or during the interaction with the committee.
- 6. Selected candidates must register for an intensive summer semester between the 3<sup>rd</sup> and 4<sup>th</sup> year (i.e., after the 6<sup>th</sup> semester), during which they will complete courses originally scheduled for the 7<sup>th</sup> semester in the regular B.Tech. program. These courses include Professional Ethics (2 credits), two Department Electives (8 credits), and one Open Elective (3 credits), ensuring they meet the required credit load within the accelerated timeline.
- 7. The major project or internship originally planned for the 8<sup>th</sup> semester in the regular B.Tech. program will be shifted to the 7<sup>th</sup> semester in the accelerated program.
- Students opting for the Accelerated Learning Program are discouraged from enrolling in add-on programs such as Honours and Minors to ensure they can effectively manage the intensive coursework and project requirements within the shorter duration.

Thus, a candidate should have successfully earned 160 credits within three-and-a-half years following the aforementioned procedure to qualify for a B.Tech. in YY Engineering under the Accelerated Learning Program.

#### NOTE:

This Accelerated Learning Program is designed in line with the provisions of NEP-2020 but will be implemented only after the final approval and guidelines released by AICTE.





# $\mathsf{ANNEXURE}-2$

## SUPPLEMENT REGULATION FOR PURSUING B.TECH. WITH RESEARCH HONOURS (SPECIALIZATION: XX)

A candidate willing to transform his / her B.Tech. programme into research orientation should meet the following terms and conditions

- 1. He / she should register add-on credits for Honours specializing in a particular stream XX in his discipline of study.
- 2. He / she should have maintained a CGPA of 8.0 up to the end of 4<sup>th</sup> semester (II-year Even semester).
- 3. He / she should have successfully completed all the credit requirements up to the end of 4<sup>th</sup> semester.
- 4. He / she should indicate willingness to transfer his/her study from B.Tech. with Honours to B.Tech. with Research Honours during the Module-2 period of III year- Odd semester (5<sup>th</sup> Semester), when the applications are floated by the office of the Dean AAA for the purpose.
- 5. He / she has to appear for an aptitude test / interaction and the corresponding committee of experts constituted for the purpose has to recommend his / her name.
- 6. All recommended candidates may take up research project in a research lab / a research institution/ an institute of repute / a research organization or in the department of VFSTR.
- 7. All such candidates may compete for research internship support from the external research institutions or may be supported with research internship within VFSTR. This internship support will be for one full semester duration during his 8<sup>th</sup> semester extendable by one or two months during the Summer semester that falls in the sequel to 8<sup>th</sup> semester, in which case the extended period will be treated as 8<sup>th</sup> semester itself.
- 8. Such candidates are normally expected to pursue research in the area of specialization chosen for B.Tech. with Honours study.
- 9. Such candidates should register for a course on Research Methodology in III year- II semester as Open elective-2.
- 10. Such candidates should have identified a broad research problem by the end of 6<sup>th</sup> semester, as a part of his / her Module-2 requirement in the course on Research Methodology (Open elective-2).
- 11. In the 7<sup>th</sup> semester (IV year- I semester) he / she has to take up Research preliminaries for his / her Honours- 4 credit requirements. This will be a research project work by itself in the broad area of the proposed research problem. The candidate shall be able to complete a good literature survey, execute basic / preliminary implementations and by the end of module-2 of Honours 4, he / she should have identified the specific research problem on which he / she will take up research during 8<sup>th</sup> semester. The entire course (Honours 4) will be evaluated as per the requirements of a project work.
- 12. The candidate takes up the intensive research work during IV year II semester for 16 credits (which is combined project work of 12 credits and Honours-5 of 4 credits). He / she should spend a minimum duration of 5 months on the research work. If required, he / she will be considered for research internship period in the extended period also. In fact, he/ she may conserve time by starting the research work immediately after the completion of 7<sup>th</sup> semester.

Thus a candidate should have successfully earned 160 + 10 + 16 = 186 credits following the aforementioned procedure to qualify for B.Tech. in YY Engineering with Research Honours (Specialization: XX).

### ANNEXURE - 3

### SUPPLEMENT REGULATION FOR YEAR-LONG PROJECT OR INDUSTRY INTERNSHIP

To encourage in-depth research and industry engagement, an opportunity for students to undertake either a full-year project or a year-long industry internship is provided in R25 regulations. By integrating this provision within the curriculum, students can gain hands-on experience, develop technical expertise, and enhance professional competencies while fulfilling academic requirements. This initiative is aligned with the institute's commitment to fostering research-driven learning and industry collaboration.

A candidate opting for a full-year project or a year-long industry internship must fulfill the following requirements:

- 1. The course structure for the first six semesters remains intact.
- 2. The candidate must not have any active 'R' or 'I' grades by the end of the 5<sup>th</sup> semester.
- 3. The candidate must provide documentary proof of earning 4 credits under 'Work-in-Lieu of a Course', as per R25 regulations.
- 4. A formal application must be submitted to the Office of the Dean (AAA) during Module-2 of the 6<sup>th</sup> semester, expressing intent to pursue the Yearlong Project or Industry Internship.
- 5. A committee constituted by honourable Vice-Chancellor will scrutiny all such applications and recommend the suitable candidates for approval
- 6. Students approved under this provision must register for a 13-credit project or internship in the 7<sup>th</sup> semester, while the major project or internship in the 8<sup>th</sup> semester will remain unchanged.
- 7. Departments may recommend equivalent credits (13 credits) for the 7<sup>th</sup> semester project or internship, aligning with the following academic categories:
  - Professional Ethics (2 credits): Assessed based on the student's ability to adhere to ethical standards, professionalism and responsibilities in the assigned work.
  - Department Electives (8 credits): Granted for domain-specific contributions and technical expertise demonstrated during the project or internship.
  - Open Electives (3 credits): Awarded based on project management, leadership, teamwork, and collaboration skills exhibited throughout the project duration.

This scheme is designed to bridge the gap between academic learning and practical application, enabling students to engage in advanced research or industry-driven projects. By integrating this framework, students will develop strong analytical, problem-solving, and professional skills, enhancing their career readiness and research potential. The structured evaluation ensures that students meet academic standards while gaining valuable industry exposure or research experience, ultimately contributing to their holistic development







# B.TECH. PROGRAM MAJOR REVISION - R25 & C25 COURSE STRUCTURE (MPC STREAM)

# **Induction Program**

Course Code	Course Title	L	т	Р	SL	С	Course Category
25SA101	Orientation Program (Induction Program)	0	2	0	0	1	Binary graded
	Total	0	2	0	0	1	

# **Pre - Semester**

Course Code	Course Title	L	т	Р	SL	с	Course Category
25MT101	Foundations of Engineering Mathematics	0	3	2	0	1	Basic Sciences
25EN101	English Language and Communication	0	3	2	0	1	Humanities
25TP101	Foundation to Intermediate Quantitative Apti- tude & Logical Reasoning	0	5	0	0	1	Humanities
25AM101	IT Tools	0	0	2	0	1	Basic Engineering
25SA102	Self-Empowerment and Gender Sensitization	0	2	0	0	1	Binary graded
25EN102	Universal Human Values	0	2	0	0	1	Binary graded
	Sub Total	0	15	6	0	6	
	Total	21				6	

# B.TECH. PROGRAM MAJOR REVISION - R25 & C25 COURSE STRUCTURE (BIPC STREAM)

# **Induction Program**

Course Code	Course Title	L	т	Ρ	SL	с	Course Category
25SA101	Orientation Program (Induction Program)	0	2	0	0	1	Binary graded
	Total	0	2	0	0	1	

## **Pre - Semester**

Course Code	Course Title	L	т	Р	SL	с	Course Category
25MT102	Engineering Mathematics Fundamentals	0	3	2	0	1	Basic Sciences
25EN101	English Language and Communication	0	3	2	0	1	Humanities
25TP101	Foundation to Intermediate Quantitative Apti- tude & Logical Reasoning	0	5	0	0	1	Humanities
25AM101	IT Tools	0	0	2	0	1	Basic Engineering
25SA102	Self-Empowerment and Gender Sensitization	0	2	0	0	1	Binary graded
25EN102	Universal Human Values	0	2	0	0	1	Binary graded
	Sub Total	0	15	6	0	6	
	Total	21				6	





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