

CURRICULUM  
2020  
(Autonomous)

Draft  
Version 1.0

B.Tech  
Mechanical Engineering



**MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY**

Mar Ivanios Vidyanagar, Nalanchira, Thiruvananthapuram – 695 015

October 2020

## MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF MECHANICAL ENGINEERING

### Vision and Mission of the Institution

**Vision:**

To be an Institution moulding globally competent professionals as epitomes of Noble Values.

**Mission:**

To transform the Youth as technically competent, ethically sound and socially committed professionals, by providing a vibrant learning ambience for the welfare of humanity.

### Vision and Mission of the Department

**Vision:**

To be a Centre of Excellence in education and research, imparting ethical values for the betterment of mankind.

**Mission:**

To impart Technical Knowledge and Values through continuous training and research for the overall development of the stakeholders.

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

1. Graduates will be Engineering Professionals, Innovators or Entrepreneurs engaged in Technology Development or implementation of Engineering Systems in Industry.
2. Graduates will be successful in pursuing higher studies or research in Engineering or Management Studies.

### **PROGRAMME OUTCOMES (POs):**

Engineering Graduates will have the ability to:

- (a) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- (b) **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- (c) **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental aspects.
- (d) **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- (e) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- (f) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the

professional engineering practice.

- (g) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- (h) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- (i) **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- (j) **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- (k) **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- (l) **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### **PROGRAMME SPECIFIC OUTCOMES (PSOs):**

Engineering Graduates will have the ability to:

1. Apply the concepts of solid mechanics in the design of mechanical engineering systems.
2. Apply knowledge of thermal and fluid Sciences to solve engineering problems.
3. Use simulation tools and computer integrated systems in mechanical engineering.
4. Apply advanced manufacturing processes and modern industrial management techniques in engineering.

## CURRICULUM UNDER AUTONOMY STATUS

**Medium of instruction: English**

### i) Knowledge Segments and Credits

Every course of B.Tech Programme is placed in one of the nine categories as listed in table below. No semester shall have more than six lecture-based courses and two laboratory courses, and/or drawing/seminar/project courses in the curriculum.

Sl. No.	Category	Category Code	Total credits
1	Humanities and Social Sciences including Management Courses	HSC	8
2	Basic Science Courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Programme Core Courses, Comprehensive Course Work and Viva Voce	PCC	78
5	Programme Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project Work and Seminar	PWS	8
8	Mandatory Non-credit Courses (P/F) with Grade	MNC	---
9	Mandatory Student Activities (P/F)	MSA	2
<b>Total Mandatory Credits</b>			<b>162</b>
	Value Added Courses (Optional) – Honours/Minor	VAC	20

**Humanities and Social Sciences including Management Courses:** Professional Ethics, Life Skills and Professional Communication. Industrial Economics and Foreign Trade, Management for Engineers,

**Basic Science Courses:** Mathematics, Engineering Physics, Engineering Chemistry, Physics and Chemistry Lab.

**Engineering Science Courses:** Basics of Civil and Mechanical Engineering, Basics of Electrical and Electronics Engineering, Civil and Mechanical Workshop, Electrical and Electronics Workshop, Design and Engineering, Engineering Mechanics, Engineering Graphics and Programming in C.

**Mandatory Non-credit Courses:** Sustainable Engineering, Constitution of India, Disaster Management and Industrial Safety Engineering.

### ii) Semester-wise Credit Distribution

Semester	I	II	III	IV	V	VI	VII	VIII	Total
<b>Credits for Courses</b>	17	21	22	22	23	23	15	17	<b>160</b>
<b>Activity Points (Min.)</b>	40				60				<b>100</b>
<b>Credits for Activities</b>	2								<b>2</b>
<b>Total Credits</b>									<b>162</b>
<b>Value Added Courses (Optional) – Honours / Minor</b>									<b>20</b>

### iii) Minor

#### Purpose

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech Degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programmes.

#### To earn credits in Minor

A set of courses and/or other activities like projects necessary for earning a minor is prescribed in specialist baskets. Each basket has 4 courses and two mini projects. Each basket has sequences within it, i.e., advanced courses rest on basic courses in the basket.

S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as “Bachelor of Technology in Mechanical Engineering with Minor in xxx”. The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

- (a) All B. Tech students shall be eligible to register for Minor in Engineering.
- (b) The Registration for Minor Programme is permitted at the beginning of third semester.
- (c) The batch size of a Minor Programme can be between 20(-)10% to 60(+)-10%. That is number of students in a batch be in between 18 to 66. Each batch shall be mapped to a faculty member.
- (d) A student can take Honours and Minor together, if all eligibility criteria are satisfied.
- (e) Total credits required for award of Minor is **182** (162 + 20 credits from value added courses).
- (f) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in one of the baskets in the curriculum for Minor. Of these three courses, one shall be a mini project to be done in S7 or S8 based on the chosen area of study.
- (g) The remaining 8 credits could be acquired by undergoing approved MOOCs or through courses listed in the curriculum. The MOOC courses chosen shall be relevant to the concerned courses in the respective minor basket.
- (h) Reshuffling of courses between various baskets will not be allowed.
- (i) The classes for Minor will be conducted along with regular classes and no extra time shall be required for conducting the courses.
- (j) If a student fails in any course of the minor, he/she shall not be eligible to continue the B. Tech Minor. There won't be any supplementary examination for the courses chosen for Minor. However, the additional credits and grades thus far earned by the student shall be included in the grade card.
- (k) Under graduate Degree with Minor shall be issued by the University to the students who fulfil all the academic eligibility requirements for the B. Tech Programme and Minor.

#### **iv) B. Tech (Honours)**

##### **Purpose**

Honours is an additional credential a student may earn if s/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. It is intended for an academically outstanding student to gain expertise/specialise in an area inside his/her major B. Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. It is particularly suited for students aiming to pursue higher studies.

##### **To earn credits in Honours**

On successful accumulation of credits at the end of the Programme, this will be mentioned in the Degree Certificate as “Bachelor of Technology in Mechanical Engineering, with Honours.” The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the Programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

- (a) The courses are grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses.
- (b) The Honours courses are included in the curriculum from fourth to eight semesters for all branches.
- (c) Registration is permitted for Honours at the beginning of fourth semester.
- (d) Total credits required is **182** (162 + 20 credits from value added courses).
- (e) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for Honours, of which one course shall be a mini project based on the chosen area. The mini project shall be done in S8.
- (f) The remaining 8 credits could be acquired by undergoing approved MOOCs or through courses listed in the curriculum.
- (g) The classes for Honours will be conducted along with regular classes and no extra time shall be required for conducting the courses.
- (h) The students should earn a grade of ‘C’ or better for all courses under Honours.
- (i) There won’t be any supplementary examination for the courses chosen for Honours.
- (j) On successful accumulation of credits at the end of the Programme, “Bachelor of Technology in Mechanical Engineering, with Honours” will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of ‘C’ or better for all courses chosen for Honours and without any history of ‘F’ Grade.

##### **v) General Guidelines**

Four hours are kept exclusively for the Remedial / Minor/ Honours courses from third to seventh semester. For the mini project of Minor or Honours in S7/S8, 7 hours are allotted. If a student does not opt for Minor/Honours courses, he/she can be given remedial classes.

<b>SEMESTER I</b>						
<b>Slot</b>	<b>Category Code</b>	<b>Course Number</b>	<b>Courses</b>	<b>L-T-P</b>	<b>Hours</b>	<b>Credit</b>
A	BSC	MA0U10A	Linear Algebra and Calculus	3-1-0	4	4
B 1/2	BSC	PH0U10B	Engineering Physics B	3-1-0	4	4
		CY0U10A	Engineering Chemistry	3-1-0	4	4
C 1/2	ESC	ES0U10A	Engineering Mechanics	2-1-0	3	3
		ES0U10B	Engineering Graphics	2-0-2	4	3
D 1/2	ESC	ES0U10C	Basics of Civil and Mechanical Engineering	4-0-0	4	4
		ES0U10D	Basics of Electrical and Electronics Engineering	4-0-0	4	4
E	HSC	HS0U10A	Life Skills	2-0-2	4	---
S 1/2	BSC	PH0U18A	Engineering Physics Lab	0-0-2	2	1
		CY0U18A	Engineering Chemistry Lab.	0-0-2	2	1
T 1/2	ESC	ES0U18A	Civil and Mechanical Engineering Lab	0-0-2	2	1
		ES0U18B	Electrical and Electronics Workshop	0-0-2	2	1
<b>TOTAL</b>					<b>23/24</b>	<b>17</b>

<b>SEMESTER II</b>						
<b>Slot</b>	<b>Category Code</b>	<b>Course Number</b>	<b>Courses</b>	<b>L-T-P</b>	<b>Hours</b>	<b>Credit</b>
A	BSC	MA0U10B	Vector Calculus, Differential Equations and Transforms	3-1-0	4	4
B 1/2	BSC	PH0U10B	Engineering Physics B	3-1-0	4	4
		CY0U10A	Engineering Chemistry	3-1-0	4	4
C 1/2	ESC	ES0U10A	Engineering Mechanics	2-1-0	3	3
		ES0U10B	Engineering Graphics	2-0-2	4	3
D 1/2	ESC	ES0U10C	Basics of Civil and Mechanical Engineering	4-0-0	4	4
		ES0U10D	Basics of Electrical and Electronics Engineering	4-0-0	4	4
E	HSC	HS0U10B	Professional Communication	2-0-2	4	---
F	ESC	ES0U10E	Programming in C	2-1-2	5	4

S 1/2	BSC	PH0U18A	Engineering Physics Lab	0-0-2	2	1
		CY0U18A	Engineering Chemistry Lab.	0-0-2	2	1
T 1/2	ESC	ES0U18A	Civil and Mechanical Engineering Lab	0-0-2	2	1
		ES0U18B	Electrical and Electronics Workshop	0-0-2	2	1
<b>TOTAL</b>					<b>28/29</b>	<b>21</b>

SEMESTER III						
Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	BSC	MA0U20A	Partial Differential Equations and Complex Analysis	3-1-0	4	4
B	PCC	ME1U20A	Mechanics of Solids	3-1-0	4	4
C	PCC	ME1U20B	Mechanics of Fluids	3-1-0	4	4
D	PCC	ME1U20C	Metallurgy and Material Science	3-1-0	4	4
E 1/2	ESC	ES0U20A	Design and Engineering	2-0-0	2	2
	HSC	HS0U20A	Professional Ethics	2-0-0	2	2
F	MNC	NC0U20A	Sustainable Engineering	2-0-0	2	---
S	PCC	ME1U28A	Computer Aided Machine Drawing	0-0-3	3	2
T	PCC	CE0U28A	Materials Testing Lab	0-0-3	3	2
R/M	VAC		Remedial/Minor Course	3-1-0	4	4
<b>TOTAL</b>					<b>26/30</b>	<b>22/26</b>

SEMESTER IV						
Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	BSC	MA0U20D	Probability, Statistics and Numerical Methods	3-1-0	4	4
B	PCC	ME1U20D	Engineering Thermodynamics	3-1-0	4	4
C	PCC	ME1U20E	Manufacturing Process	3-1-0	4	4
D	PCC	ME1U20F	Fluid Machinery	3-1-0	4	4
E 1/2	ESC	ES0U20A	Design and Engineering	2-0-0	2	2
	HSC	HS0U20A	Professional Ethics	2-0-0	2	2
F	MNC	NC0U20B	Constitution of India	2-0-0	2	---



S	PCC	ME1U28B	FM and HM Lab	0-0-3	3	2
T	PCC	ME1U28C	Machine Tools Lab-I	0-0-3	3	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-1-0	4	4
<b>TOTAL</b>					<b>26/30</b>	<b>22/26</b>

<b>SEMESTER V</b>						
Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	PCC	ME1U30A	Mechanics of Machinery	3-1-0	4	4
B	PCC	ME1U30B	Thermal Engineering	3-1-0	4	4
C	PCC	ME1U30C	Industrial and Systems Engineering	3-1-0	4	4
D	PCC	ME1U30D	Machine Tools and Metrology	3-1-0	4	4
E 1/2	HSC	HS0U30A	Industrial Economics and Foreign Trade	3-0-0	3	3
	HSC	HS0U30B	Management For Engineers	3-0-0	3	3
F	MNC	NC0U30A	Disaster Management	2-0-0	2	---
S	PCC	ME1U38A	Machine Tools Lab-II	0-0-3	3	2
T	PCC	ME1U38B	Thermal Engineering Lab-I	0-0-3	3	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-1-0	4	4
<b>TOTAL</b>					<b>27/31</b>	<b>23/27</b>

<b>SEMESTER VI</b>						
Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	PCC	ME1U30E	Heat and Mass Transfer	3-1-0	4	4
B	PCC	ME1U30F	Dynamics of Machinery and Machine Design	3-1-0	4	4
C	PCC	ME1U30G	Advanced Manufacturing Engineering	3-1-0	4	4
D	PEC	ME1UXXX	Programme Elective I	2-1-0	3	3
E 1/2	HSC	HS0U30A	Industrial Economics and Foreign Trade	3-0-0	3	3
	HSC	HS0U30B	Management For Engineers	3-0-0	3	3
F	PCC	ME1U30H	Comprehensive Course Work	1-0-0	1	1

S	PCC	ME1U38C	Computer Aided Design and Analysis Lab	0-0-3	3	2
T	PCC	ME1U38D	Thermal Engineering Lab-II	0-0-3	3	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-1-0	4	4
<b>TOTAL</b>					<b>25/29</b>	<b>23/27</b>

### PROGRAMME ELECTIVE I

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
D	PEC	ME1U31A	Nondestructive Testing	2-1-0	3	3
		ME1U31B	Data Analytics for Engineers	2-1-0	3	3
		ME1U31C	Advanced Mechanics of Solids	2-1-0	3	3
		ME1U31D	IC Engines, Combustion and Pollution	2-1-0	3	3
		ME1U31E	Automobile Engineering	2-1-0	3	3
		ME1U31F	Product Design & Development	2-1-0	3	3
		ME1U31G	Advanced Metal Joining Techniques	2-1-0	3	3

SEMESTER VII						
Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	PCC	ME1U40A	Design of Machine Elements	2-1-0	3	3
B	PEC	ME1UXXX	Programme Elective II	2-1-0	3	3
C	OEC	ME0UXXX	Open Elective	2-1-0	3	3
D	MNC	NC0U40A	Industrial Safety Engineering	2-1-0	3	----
E	PCC	ME1U48A	Mechanical Engineering Lab	0-0-3	3	2
T	PWS	ME1U49A	Seminar	0-0-3	3	2
U	PWS	ME1U49B	Project Phase I	0-0-6	6	2
R/M/H	VAC		Remedial/Minor/Honours Course	0-1-6/ 3-1-0	7/4	4
<b>TOTAL</b>					<b>24/ (31/28)</b>	<b>15/19</b>

### PROGRAMME ELECTIVE II

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
B	PEC	ME1U41A	Advanced Methods in Nondestructive Testing	2-1-0	3	3

		ME1U41B	Optimization Techniques and Applications	2-1-0	3	3
		ME1U41C	Finite Element Method	2-1-0	3	3
		ME1U41D	Aerospace Engineering	2-1-0	3	3
		ME1U41E	Hybrid and Electric Vehicles	2-1-0	3	3
		ME1U41F	Operations Management	2-1-0	3	3
		ME1U41G	Air Conditioning and Refrigeration	2-1-0	3	3

### OPEN ELECTIVE I

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
C	OEC	ME0U41A	Introduction to Business Analytics	2-1-0	3	3
		ME0U41B	Quantitative Techniques for Engineers	2-1-0	3	3
		ME0U41C	Automotive Technology	2-1-0	3	3
		ME0U41D	Renewable Energy Engineering	2-1-0	3	3
		ME0U41E	Quality Engineering and Management	2-1-0	3	3

### SEMESTER VIII

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	PCC	ME1U40B	Mechatronics	2-1-0	3	3
B	PEC	ME1UXXX	Programme Elective III	2-1-0	3	3
C	PEC	ME1UXXX	Programme Elective IV	2-1-0	3	3
D	PEC	ME1UXXX	Programme Elective V	2-1-0	3	3
T	PCC	ME1U40C	Comprehensive Viva Voce	1-0-0	1	1
U	PWS	ME1U49C	Project Phase II	0-0-12	12	4
R/M/H	VAC		Remedial/Minor/Honours Course	0-1-6	7	4
<b>TOTAL</b>					<b>25/32</b>	<b>17/21</b>

### PROGRAMME ELECTIVE III

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
B	PEC	ME1U42A	Quality Management	2-1-0	3	3
		ME1U42B	Decisions with Metaheuristics	2-1-0	3	3
		ME1U42C	Pressure Vessel and Piping Design	2-1-0	3	3

		ME1U42D	Computational Fluid Dynamics	2-1-0	3	3
		ME1U42E	Industrial Tribology	2-1-0	3	3
		ME1U42F	Micro and Nano Manufacturing	2-1-0	3	3
		ME1U42G	Heating and Ventilation Systems	2-1-0	3	3

#### PROGRAMME ELECTIVE IV

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
C	PEC	ME1U43A	Composite Materials	2-1-0	3	3
		ME1U43B	Artificial Intelligence and Machine Learning	2-1-0	3	3
		ME1U43C	Acoustics and Noise Control	2-1-0	3	3
		ME1U43D	Heat Transfer Equipment Design	2-1-0	3	3
		ME1U43E	Robotics and Automation	2-1-0	3	3
		ME1U43F	Technology Management	2-1-0	3	3
		ME1U43G	Cryogenic Engineering	2-1-0	3	3

#### PROGRAMME ELECTIVE V

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
D	PEC	ME1U44A	Reliability Engineering	2-1-0	3	3
		ME1U44B	Industrial Internet of Things	2-1-0	3	3
		ME1U44C	Fracture Mechanics	2-1-0	3	3
		ME1U44D	Gas Turbines and Jet Propulsion	2-1-0	3	3
		ME1U44E	Advanced Energy Engineering	2-1-0	3	3
		ME1U44F	Additive Manufacturing	2-1-0	3	3
		ME1U44G	Power Plant Engineering	2-1-0	3	3

**MINOR**

Semester	BASKET I				BASKET II				BASKET III			
	Course Number	Course	L-T-P	Credit	Course Number	Course	L-T-P	Credit	Course Number	Course	L-T-P	Credit
S3	ME0M 20A	Mechanics of Materials	3-1-0	4	ME0M 20B	Fluid Mechanics and Machinery	3-1-0	4	ME0M 20C	Material Science and Technology	3-1-0	4
S4	ME0M 20D	Theory of Machines	3-1-0	4	ME0M 20E	Thermodynamics	3-1-0	4	ME0M 20F	Manufacturing Technology	3-1-0	4
S5	ME0M 30A	Dynamics of Machines	3-1-0	4	ME0M 30B	Thermal Engineering	3-1-0	4	ME0M 30C	Machine Tools Engineering	3-1-0	4
S6	ME0M 30D	Machine Design	3-1-0	4	ME0M 30E	Heat Transfer	3-1-0	4	ME0M 30F	Industrial Engineering	3-1-0	4
S7	ME0M 49A	Mini Project	0-1-6	4	ME0M 49A	Mini Project	0-1-6	4	ME0M 49A	Mini Project	0-1-6	4
S8	ME0M 49B	Mini Project	0-1-6	4	ME0M 49B	Mini Project	0-1-6	4	ME0M 49B	Mini Project	0-1-6	4

**B.Tech (HONOURS)**

Semester	GROUP I				GROUP II				GROUP III			
	Course Number	Course	L-T-P	Credit	Course Number	Course	L-T-P	Credit	Course Number	Course	L-T-P	Credit
S4	ME1H 20A	Continuum Mechanics	3-1-0	4	ME1H 20B	Advanced Mechanics of Fluids	3-1-0	4	ME1H 20C	Materials in Manufacturing	3-1-0	4
S5	ME1H 30A	Experimental Stress Analysis	3-1-0	4	ME1H 30B	Advanced Thermodynamics	3-1-0	4	ME1H 30C	Fluid Power Automation	3-1-0	4
S6	ME1H 30D	Advanced Design Synthesis	3-1-0	4	ME1H 30E	Compressible Fluid Flow	3-1-0	4	ME1H 30F	Advanced Numerical Controlled Machining	3-1-0	4
S7	ME1H 40A	Advanced Theory of Vibrations	3-1-0	4	ME1H 40B	Computational Methods in Fluid Flow and Heat Transfer	3-1-0	4	ME1H 40C	Precision Machining	3-1-0	4
S8	ME1H 49A	Mini Project	0-1-6	4	ME1H 49A	Mini Project	0-1-6	4	ME1H 49A	Mini Project	0-1-6	4

## Evaluation Framework

### Pattern of Grading

College expects a continuous progress in learning for a student. So, the evaluation will be done on a continual basis. A student will be eligible for the award of B. Tech Degree of the University, under the autonomy, on satisfying the following requirements:

- i) Fulfilled all the curriculum requirements within the stipulated duration of the Programme.
- ii) Earned the required minimum credits and earned the requisite minimum CGPA as specified in the curriculum for the branch of study.
- iii) No disciplinary action pending or contemplated.

Students registered for a course have to attend the course regularly and undergo the Continuous Assessment(CA) and appear for the End Semester Examinations. Credits for the course are deemed to be earned only on getting at least a pass grade 'P' or better in the composite evaluation.

Pass minimum for a course shall be 40% for the End Semester Examination(ESE) and 50% of CA and ESE put together. Letter grade 'F' will be awarded to the student for a course if either his/her mark for the End Semester Examination (ESE) is below 40 % or the overall mark [Continuous Assessment + End Semester Examination] is below 50 %.

Students who received F grade in an End Semester Examination shall have to appear for the End Semester Examination at the next opportunity and earn the credits. They shall not be permitted to register for the course again.

Grading is based on the overall percentage marks obtained by the student in a course. The grade card shall only give the grades against the courses the student has registered. Semester grade card shall give the grade for each registered course, Semester Grade Point Average (SGPA) for the semester as well as Cumulative Grade Point Average (CGPA). There is no provision for improving the grades.

Grade cards shall be issued by the College to the student for the registered courses, in every semester. On earning the required credits for the degree, the College shall issue the final consolidated grade sheet for the B. Tech programme including CGPA.

### **Grade and Grade Points**

<b>Grades</b>	<b>Grade Point (GP)</b>	<b>% of Total Marks obtained in the Course</b>
S	10	90% and above
A+	9.0	85% and above but less than 90%
A	8.5	80% and above but less than 85%
B+	8.0	75% and above but less than 80%
B	7.5	70% and above but less than 75%
C +	7.0	65% and above but less than 70%
C	6.5	60% and above but less than 65%
D	6.0	55% and above but less than 60%

P (Pass)	5.5	50% and above but less than 55%
F (Fail)	0	Below 50% (CIE + ESE) or Below 40 % for ESE
FE	0	Failed due to lack of eligibility criteria
I	0	Could not appear for the End Semester Examination but fulfills the eligibility criteria
CGPA 8.0 and above		First class with Distinction
CGPA 6.5 and above		First class
Equivalent percentage mark shall be = $10 \times G - 3.75$ , where G is SGPA or CGPA		

### Calculation of SGPA/CGPA

Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) are calculated as follows.

$$SGPA = \frac{\sum C_i \times GP_i}{\sum C_i}$$

where ' $C_i$ ' is the credit assigned for a course and ' $GP_i$ ' is the grade point for that course. Summation is done for all courses specified in the curriculum of that semester.

$$CGPA = \frac{\sum C_i \times GP_i}{\sum C_i}$$

where ' $C_i$ ' is the credit assigned for a course and ' $GP_i$ ' is the grade point for that course. Summation is done for all courses specified in the curriculum up to that semester for which the 'CGPA' is needed.

CGPA for the B. Tech programme is arrived at by considering all course credits that are needed for the degree and their respective grade points.

A student shall earn 2 credits by actively involving in co-curricular and extra-curricular activities as per the guidelines issued from time to time. On getting minimum 100 activity points the student satisfies the requirement and earns the two credits which shall not be counted for the calculation of CGPA but shall be mandatory for the award of the degree.



## Break of Study

A student is permitted to avail break of study for specific purpose:

- i) In case of accident or serious illness needing prolonged hospitalization and rest.
- ii) In case the student has a bright idea and would like to initiate a start-up venture or develop a product.
- iii) In case of any personal reasons that need a break in study.
- iv) For internship leading to employment.

For break of study due to illness, student shall submit all necessary medical reports together with the recommendation of the doctor treating him giving definite reasons for break of study and its duration. Before joining back, the student should submit the fitness certificate from the doctor who had treated him.

Students who want to initiate a start-up venture or a product development, have to submit a project report, clearly indicating the purpose, action plan, technical details, funding details and future plans to the College through the Department. College shall evaluate the proposal by constituting an expert team consisting of a technocrat and a bank executive and take an appropriate decision based on the team's recommendation. The break of study for the startup shall be permitted only after the 4th semester for a maximum duration of two semesters. This is however permitted only on successfully completing the courses listed out in all the four semesters.

Students who require a break of study due to personal reasons shall convince the College on the genuine need of it by giving authentic evidence for the same.

Students who require break of study for 'internship leading to employment' shall produce the offer letter obtained from the employer concerned. College shall verify the authenticity of the offer and take appropriate decision, based on the recommendation of the standing committee. Break of study for an academic year is the preferred option to break of study for a semester. Students shall have to rejoin on the first working day of the next immediate semester after the break of study.

Students readmitted after break of study shall continue their studies in the existing scheme to which he/she was readmitted. The exemption and addition of courses to be registered, the transitory courses (approved by the Academic Council), if any due to curriculum change, shall be decided by the respective Board of Studies.

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{Subject to Approval by the competent Authorities}