

# **M. Tech – CAD/ CAM**

## **Curriculum**



**VIT<sup>®</sup>**

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**Vellore Institute of Technology**

(Deemed to be University under section 3 of UGC Act, 1956)

## Programme Name: M.Tech CAD/CAM

### Program Educational Objectives:

This is a widely sought-after programme with the objective of producing designers and manufacturing professionals with expertise in the development and application of state-of-the-art knowledge-oriented software tools for product design, rapid manufacturing, automation, quality assurance, and cost-effectiveness. Candidates with a Degree in Mechanical Engineering, Automobile Engineering, Production Engineering, Manufacturing Engineering or Mechatronics are eligible.

### Student Learning Outcomes (SLOs)

(Use the information in the attachment for the SLO statements. Also make sure that the number of SLOs and right SLOs are used for the programme. Note that different programme type has different number of SLOs depending on the duration and level of the programme. This matrix is also given in the attachment)

1. SLO\_01 (PO\_01)\*: Having an ability to apply mathematics and science in engineering applications
2. SLO\_04 (APO\_02): Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)
3. SLO\_05 (APO\_03): Having design thinking capability
4. SLO\_06 (PO\_03): Having an ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment
5. SLO\_07 (APO\_04): Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning)
6. SLO\_08 (APO\_05): Having Virtual Collaborating ability
7. SLO\_09 (PO\_06): Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems
8. SLO\_10 (PO\_08): Having a clear understanding of professional and ethical responsibility
9. SLO\_12 (PO\_07): Having adaptive thinking and adaptability in relation to environmental context and sustainable development

10. SLO\_14 (PO\_04): Having an ability to design and conduct experiments, as well as to analyze and interpret data, and synthesis of information
11. SLO\_18 (APO\_07): Having critical thinking and innovative skills
12. SLO\_19 (PO\_11): Having a good cognitive load management skills related to project management and finance
13. SLO\_20 (APO\_08): Having a good digital footprint

## Programme Specific Outcome:

- Analyse, design and develop mechanical systems to solve complex engineering problems by integrating modern mechanical engineering tools, software and equipment's.
- Adopt a multidisciplinary approach to solve real-world industrial problems
- Independently carry out research / investigation to solve practical problems and write / present a substantial technical report/document

## Program Outcomes:

At the completion of the M.Tech programme in CAD/CAM Engineering, the student will be able to...

1. Apply/develop solutions or to do research in the areas of Design and simulation in Mechanical Engineering.
2. Have abilities and capabilities in developing and applying computer software and hardware to mechanical design and manufacturing fields.
3. Review and document the knowledge developed by scholarly predecessors and critically assess the relevant technological issues.
4. Formulate relevant research problems; conduct experimental and/or analytical study and analyzing results with modern mathematical / scientific methods and use of software tools.
5. Design and validate technological solutions to defined problems and communicate clearly and effectively for the practical application of their work.

### Category-wise Credit distribution

Category	Credits
University core (UC)	27
Programme core (PC)	19
Programme elective (PE)	18
University elective (UE)	06
Bridge course (BC)	-
Total credits	70

## Detailed curriculum

### UNIVERSITY CORE

S. No.	Course Code	Course Title	L	T	P	J	C
1.	MAT 5005	Advanced Mathematical Methods	3	0	0	0	3
2.	ENG5001	Fundamentals of Communication skills	0	0	2	0	1
3.	ENG5002	Professional and Communication Skills	0	0	2	0	1
4.	FLC5097	Foreign Language	0	0	0	0	2
5.	STS5001 & STS5002	Soft skills	-	-	-	-	2
6.	SET5001 & SET5002	SET Projects	-	-	-	-	4
7.	MEE6099	Master's Thesis	-	-	-	-	16

### UNIVERSITY ELECTIVES

COURSE	CODE	COURES TITLE	L	T	P	J	C
		University Elective –I	3	0	0	0	3
		University Elective –II	3	0	0	0	3
<b>Total Credits</b>			<b>6</b>				

### PROGRAMME CORE

COURSE	CODE	COURSE TITLE	L	T	P	J	C
MEE	5013	Advanced Mechanics of Solids	2	2	0	0	3
MEE	5022	Applied Materials Engineering	3	0	0	0	3
MEE	5014	Computer Graphics and Geometric Modelling	2	0	2	0	3
MEE	5015	Finite Element Methods	2	2	2	0	4
MEE	5016	Integrated Manufacturing Systems	2	0	2	0	3
MEE	5017	Advanced Vibration Engineering	2	2	0	0	3
<b>Total Credits</b>			<b>19</b>				

## PROGRAMME ELECTIVES

COURSE	CODE	COURSE TITLE	L	T	P	J	C
MEE	6030	Advanced Finite Element Methods	2	0	0	4	3
MEE	6031	Computational Fluid Dynamics	2	0	2	0	3
MEE	5023	Design For Manufacture And Assembly	3	0	0	0	3
MEE	6033	Product Design And Life Cycle Management	2	0	0	4	3
MEE	6034	Fracture Mechanics	3	0	0	0	3
MEE	6035	Manufacturing and Mechanics Of Composites Materials	3	0	0	0	3
MEE	6012	Design and Analysis of Experiments	2	2	0	4	4
MEE	6036	Computational and Experimental Vibration Analysis And Control	2	0	2	0	3
MEE	6037	Optimisation Methods	3	0	0	0	3
MEE	6038	Design Thinking And Innovation	2	0	0	4	3
MEE	6039	Machine Fault Diagnostics	3	0	0	0	3
MEE	6040	Computer Aided Process Planning	3	0	0	0	3
MEE	6015	Additive Manufacturing Technology	2	0	0	4	3
MEE	6041	CNC Technology and Programming	2	0	0	4	3
MEE	5024	Advanced Manufacturing Technology	2	0	0	4	3
MEE	6055	Statistics and Quality Management	2	0	0	4	3
MEE	5026	Vehicle Dynamics	2	1	0	4	4
MEE	6024	Vehicle Aerodynamics	3	0	0	0	3
MEE	6042	Industrial/Research Internship	0	0	0	8	2
<b>Total Credits</b>			<b>18</b>				