

# **M.Tech - Mechatronics**

## **Curriculum and Syllabus**



**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 Mechatronics**

### Program Educational Objectives:

This programme aims to equip graduates of varied engineering disciplines with the interdisciplinary knowledge required for the development of highly-intelligent products, micro systems, automation techniques and robotic devices, in order to meet the challenges of automation required in industrial, transportation, medical, household and unmanned environments. This is an interdisciplinary programme for which candidates with a degree in any of the following disciplines are eligible: Mechanical Engineering, Mechatronics, Production Engineering, Electrical and Electronics Engineering, Instrumentation Engineering, Electronics and Communication Engineering and Computer Science Engineering.

### Student Learning Objectives:

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\_09 (PO\_06): Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems
7. SLO\_10 (PO\_08): Having a clear understanding of professional and ethical responsibility
8. SLO\_12 (PO\_07): Having adaptive thinking and adaptability in relation to environmental context and sustainable development
9. SLO\_14 (PO\_04): Having an ability to design and conduct experiments, as well as to analyze and interpret data, and synthesis of information

10. SLO\_17 (PO\_05): Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice
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

## Program Specific Outcome:

- Analyse, design and develop mechatronics systems to solve complex engineering problems by integrating mechanical, electronic and control systems
- Adopt a multidisciplinary approach to solve real-world integrated automation in 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. Program in Mechatronics Engineering, the student will be able to...

1. Apply/develop solutions or to do research in the areas of Mechatronics in Mechanical Engineering.
2. Have abilities and capabilities in developing and applying 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 analysing 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



**SCHOOL OF MECHANICAL ENGINEERING**  
**Curriculum**  
**M.Tech Mechatronics (2018 - 19 Batch onwards)**

**UNIVERSITY CORE**

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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	COURS 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
EEE	5023	Advanced Sensors and Instrumentation	3	0	2	0	4
MEE	5007	Actuators and Drives	3	0	0	4	4
MEE	5008	Robot dynamics and Programming	3	0	2	0	4
MEE	5027	System design and Control	3	0	0	4	4
EEE	5024	Industrial Controllers	2	0	2	0	3
<b>Total Credits</b>			<b>19</b>				



## PROGRAMME ELECTIVES

<b>COURSE</b>	<b>CODE</b>	<b>COURSE TITLE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>J</b>	<b>C</b>
MEE	5021	Manufacturing Automation	3	0	2	0	4
MEE	6043	Machine Vision Systems	2	0	0	4	3
MEE	6044	Mobile and Autonomous Robots	2	0	0	4	3
ECE	6057	MEMS and Microsystems	2	0	0	4	3
MEE	6045	Fluid Power System Design	3	0	2	0	4
EEE	6018	Data acquisition and Digital Signal Processing	3	0	0	4	4
EEE	6019	Advanced Control systems	3	0	0	4	4
EEE	6020	Embedded systems	2	0	0	4	3
MEE	5009	Autotronics and Vehicle Intelligence	3	0	0	4	4
MEE	6046	Intelligent Systems	3	0	0	4	4
CSE	6053	Wireless Sensor Networks	3	0	0	0	3
MEE	6047	Virtual Reality and Haptics	2	0	0	4	3
MEE	6048	Condition Monitoring Techniques	2	0	0	4	3
MEE	6060	Bio-Mechatronics	2	0	0	4	3
MEE	6058	Industrial Process Automation	2	0	0	4	3
MEE	6059	Internet of Things and Smart Manufacturing	2	0	0	4	3
MEE	6049	Industry/Research Internship	0	0	0	8	2
<b>Total Credits</b>			<b>18</b>				