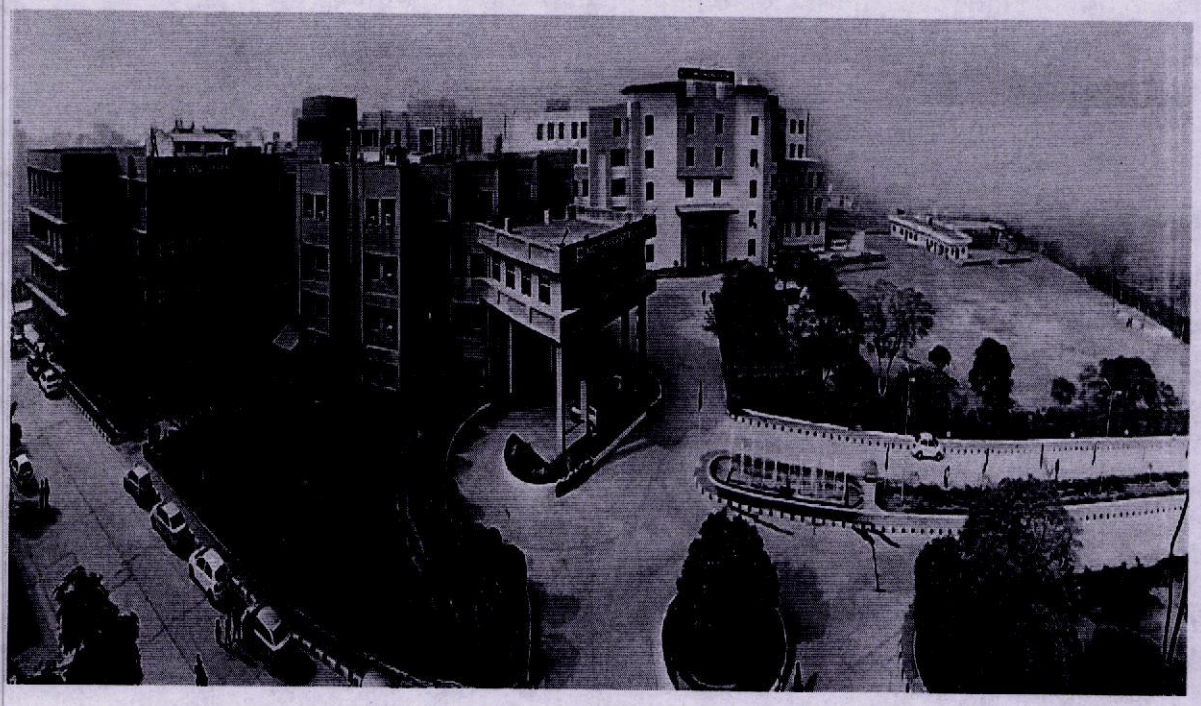
SGT University, Chandu-Budhera, Gurugram
Faculty of Engineering & Technology
Department of Mechanical Engineering



M. Tech. Mechanical Engineering
Scheme & Syllabus (2021-22)

Vision of SGT University

"Driven by Research & Innovation, we aspire to be amongst the top ten Universities in the Country by 2022"

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Vision of the Department

Department endeavors to be recognized globally through outstanding education & research that produces qualified engineers who are ready to cater the everchanging industrial and social demands.

Mission of the department

- To create environment conducive for the quality teaching-learning interdisciplinary research and innovation.
- To establish academic system facilitating real learning in Mechanical Engineering.
- To prepare the graduates be leader in the profession.
- To inculcate universal human values, professional ethics and life-long learning attitude.
- To empower the learners to device their own unique path of education for acquiring multi specializations and skills.

Program Specific Outcomes

- **PSO1** To broaden and deepen the knowledge base with philosophical temperament and attitude by providing research environment for mechanical and allied engineering. To equip the students with integrity and ethical values so that, they become responsible technocrats around the globe.
- **PSO2** To brace the students with latest development and trends of technology in the area of interest by making the M. Tech. teaching scheme elective to facilitate the students to decide on the broad area of specialisation.
- **PSO3** To develop and enhance the research approach with a fair degree of novelty by practical skills to design experimentation, data acquisition and presentation, data reduction and interpretation by a full semester dissertation work based on a research problem.

Program Educational Objectives (PEOs)

- **PEO1** Acquire in depth knowledge in optimisation techniques for various manufacturing process.
- **PEO2** Achieve expertise in industrial automation design and development.
- **PEO3** Foster frontier technological research in thermal science and engineering area.
- **PEO4** Undertake design of machines/components/process to meet desired specifications of need and constraints.
- **PEO5** Undertake challenges in design and development related to industrial engineering put forth by the academia and industry.

Program Outcomes (POs)

- **PO1** An ability to independently carry out research /investigation and development work to solve practical problems of Mechanical Engineering.

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- **PO2** An ability to write and present a substantial technical report/document
- **PO3** Students should be able to demonstrate a degree of mastery in the area of Mechanical Engineering. The mastery should be at a level higher than the requirements in the bachelor program of Mechanical Engineering
- **PO4** An ability to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data for the solution of complex problems of manufacturing industries/institutions
- **PO5** An ability to develop and apply computer-based software and hardware tools for the analysis of problems related to mechanical design, manufacturing and automation fields.
- **PO6** An ability to apply the acquired knowledge to assess societal, safety, ethical issues and subsequently design / develop mechanical equipment's and systems

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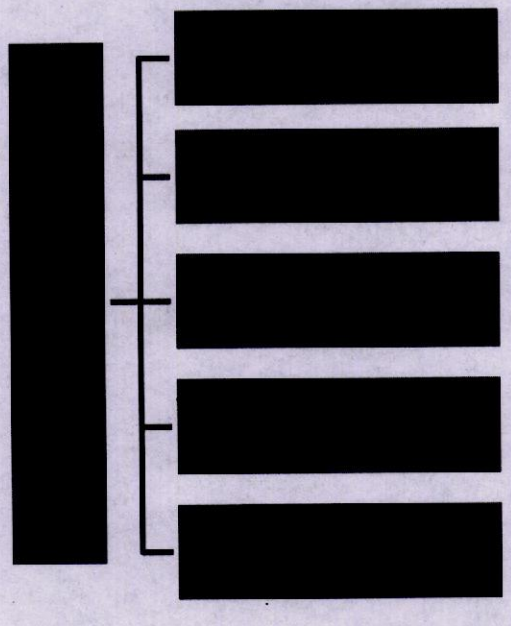
Curriculum Design & Development Process

Engineering Science is a new concept of multidisciplinary program that emphasizes enhanced understanding and integrated application of engineering, science and mathematics. B. Tech. in Mechanical Engineering gaining greater acceptance from the employers, as student are industry ready possessing greater skills. The B.Tech. courses are being carefully crafted after integrating inputs from leading national and international experts both from industries as well as academia. Here are some of the highlights of the program.

- Departmental subjects are introduced from 3rd semester onwards. The curriculum is based on a unique mix of basic sciences, humanities, core engineering, and discipline-specific subjects.
- There are many choices of elective subjects, which may or may not be related to the parent discipline comes under open elective.
- The Choice based credit system is introduced. CBCS provides a "cafeteria" type approach in which the students can take courses of their choice, learn as per interest, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning.
- Huge emphasis is given on the industrial projects to address real-life issues and problems faced by the industries. Students are encouraged and facilitated to undergo training and internship during summer vacation to industries and/or national and international universities/research laboratories



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List of programs being offered by the Department (with broad credit distribution)

A. M. Tech. Program

1. M. Tech. Mechanical Engineering

Note:

1. A student will be eligible to get Post Graduate degree with **Honours**, if he/she completes an additional 18-20 credits. These can be acquired through SWAYAM MOOCs. The list of MOOC courses will be provided by the Departement to the students before commencement of the semester.
2. Student can opt for any of the Value-Added Course subject outside from the Parent Institute leading to Holistic Development of student. It may include Yoga, Dance, Fashion, Agriculture, Medicine, etc. These courses as mentioned in the curriculum can be opted from the University Pool which is circulated before the commencement of semester classes.

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Curriculum for M. Tech. (Mechanical Engineering) Program

Semester Wise Course Structure

First Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Int.	Ext.	
1.		Computer Aided Engineering	3	0	0	3	40	60	100
2.		Research Methodology and IPR	3	0	0	3	40	60	100
3.		Advanced Fluid Mechanics	3	0	0	3	40	60	100
4.		Elective-I	3	0	0	3	40	60	100
5.		Value Added Courses-I	2	0	0	2	40	60	100
6.		Computer Aided Engineering Lab	0	0	2	1	60	40	100
7.		Research Methodology and IPR Lab	0	0	2	1	60	40	100
8.		Seminar	0	0	2	1	100	-	100
		Total	**14**		**6**	**17**	**420**	**380**	**800**

S. No.	Elective-I	
1.		Advanced Design of Mechanical Systems
2.		Statistics for Decision Making
3.		Numerical & Optimization Methods
4.		Design of Solar and Wind System

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Curriculum for M. Tech. (Mechanical Engineering) Program

Semester Wise Course Structure

Second Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Int.	Ext.	
1.		Finite Element Analysis	3	0	0	3	40	60	100
2.		Vibration and Condition Monitoring	3	0	0	3	40	60	100
3.		Advance Heat Transfer	3	0	0	3	40	60	100
4.		Elective II	3	0	0	3	40	60	100
5.		Manufacturing Simulation Lab	0	0	2	1	60	40	100
6.		Vibration and Condition Monitoring Lab	0	0	2	1	60	40	100
7.		Seminar	0	0	2	1	100	-	100
		Total	**12**	**0**	**6**	**15**	**380**	**320**	**700**

S. No.	Elective-II	
1.		Advanced Mechanics of Solids
2.		Analysis of Manufacturing Processes
3.		Production & Operations Management
4.		Energy Conservation and Management

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Curriculum for M. Tech. (Mechanical Engineering) Program

Semester Wise Course Structure

Third Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Int.	Ext.	
1.		Computer Integrated Manufacturing System	3	0	0	3	40	60	100
2.		Elective-III	3	0	0	3	40	60	100
3.		Elective IV	3	0	0	3	40	60	100
4.		Elective V	3	0	0	3	40	60	100
5.		Value Added Courses-II	2	0	0	2	40	60	100
6.		Computer Integrated Manufacturing System Lab	0	0	2	1	60	40	100
7.		Identification of Research Problem	0	0	2	1	60	40	100
		Total	**14**	**0**	**4**	**16**	**320**	**380**	**700**

S. No.	Elective- III		S. No.	Elective-IV	
		Industrial Automation and Robotics	1.		Advance Operation Research
		Reliability Based Design	2.		Artificial Intelligence in Automation
		Technology & Manufacturing Strategies	3.		Machine Learning for Applications in Mechanical Engineering
		Thermodynamics and Combustion	4.		Air Conditioning & System Design

S. No.	Elective-V	
1.		Advance Tribology
2.		Hydraulic & Pneumatic Systems
3.		I.C. Engines Process Modeling
4.		Gas Turbines

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Curriculum for M. Tech. (Mechanical Engineering) Program

Semester Wise Course Structure

Fourth Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Int.	Ext.	
1.		**Dissertation**	-	-	20 W	20	120	80	200
	Overall Total Credits = I to IV= 68								

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