



# SRINIVAS UNIVERSITY

## COLLEGE OF ENGINEERING & TECHNOLOGY

Main Campus: Srinivas Nagar, Mukka, Surathkal, Mangalore, - 574 146, INDIA  
(Private University Established by Karnataka Govt. ACT No.42 of 2013. Recognized by UGC, New Delhi &  
Member of Association of Indian Universities, New Delhi); Administrative Office: GHS Road, Mangaluru-575001

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### DEPARTMENT OF MECHANICAL ENGINEERING

#### Master of Technology (M.TECH) ROBOTICS & AUTOMATION

##### About the Course:

**M.Tech. in Robotics & Automation** is a two-year (4 Semester) full-time postgraduate engineering programme aimed at shaping the student's managerial and technical skills in the field of engineering. The aim of the Master of Technology in Robotics & Automation (M.Tech.) program is to prepare students for successful careers in the field of Robotics & Automation Engineering as per international standards and to prepare them to become responsible and contributing members of the community.

**Robotics**, the branch of technology that deals with the design, construction, operation, and application of robots, has become a highly relevant and upcoming discipline. It is being increasingly applied to almost every field of activity including improving the standard of living of humans, handling dangerous and hazardous situations, relieving mankind of repetitive and tiring activities, exploring outer space and performing complex medical procedures. Many industries also use robots in their manufacturing facilities and research. For instance, robots are used in areas like high heat welding and continuous handling of heavy loads. They can function tirelessly even in the most inhospitable working conditions. Owing to this, robots are taking over from man most of the manipulative, hazardous and tedious jobs in factories, mines, atomic plants, spaceships, deep-sea vessels, etc. The automation of work through robotics has led to substantial increase in productivity in these areas.

Given its diverse applications, the robotics field today demands in-depth knowledge of a broad range of disciplines such as electronics, computers, instrumentation and mechanics. A graduate entering the workforce in the area of robotics must be thoroughly familiar with intelligent systems and proficient in computer vision, control systems, and machine learning, as well as the design and programming of robotic systems. Specialization in automation also requires the student to apply a wide range of engineering principles in order to understand, modify or control the manufacture, delivery and maintenance of technology components in a broad range of industries. Graduates must know how to develop and maintain systems that cost-effectively optimise productivity and quality control.

**Duration:** 2 Years / 4 Semesters.

**Eligibility:** Candidates with B.Tech/B.E. Degree in Mechanical /Manufacturing / Industrial and Production Engineering / Mechatronics / Electrical & Electronics / Electronics & Communication / Information Technology / Computer Science & Engineering / AMIE Degree in concerned discipline or its equivalent from a recognized University.

##### Courses Offered:

**B.Tech. Mechanical Engineering**

**B.Tech. Robotics, Artificial Intelligence & Machine Learning**

**M.Tech. Robotics & Automation**

**M.Tech. Computer Integrated Manufacturing**

**M.Tech. Thermal Power Engineering**

**Ph.D.**

**PDF Engineering & Technology**

**D.Sc. Engineering & Technology**

## **Vision and Mission:**

### **Vision:**

To become a leading learning centre in Mechanical Engineering by providing students the necessary knowledge and professional skills for innovations, research and development and capability for serving industry and research establishments with a strong concern for societal needs and environment.

### **Mission:**

- Provide students the knowledge that builds within them, a strong foundation in the basic principles of mechanical engineering, problem solving abilities, analytical skills, soft skills and communication skills for their overall development.
- Develop talented and committed human resource with an aptitude for creativity, team-spirit, entrepreneurship abilities, for lifelong growth in their professional careers.
- Impart quality education to students to meet the needs of profession and society, and to promote high standards of professional ethics, transparency and accountability.

## **Special Features of the Programme:**

- Industry oriented syllabus with special focus on experimental learning
- Seminars, Technical Talks and Interactions with industrial experts
- Placement support and research oriented projects for every student.
- Focus on smart skill development & training on Mechanical Engineering practices.
- Opportunity for internship and project work in industries.
- Tie up with industries to get students trained in latest technology through industry sessions/ workshops.

## **Program Educational Objectives:**

- To prepare students to meet the industrial requirements at global level competitiveness.
- To develop the students analytical skills to enable them to understand real world problems and formulate solutions.
- To impart basic education to students in the areas of Design Engineering, Manufacturing Engineering and Thermal Sciences that will enable them to take up higher studies in these areas.
- To allow students to work in teams through group project works and thus help them achieve interpersonal and communication skills.
- To inculcate the habit of lifelong learning, adherence to ethics in profession, concern for environmental and regard for good professional practices.

## **Career Opportunities:**

Robotic science has a tremendous scope as a career option as robots play an important role in the industrial sector. They help in speeding up the process of manufacturing and finds tremendous application in the fields of nuclear science, exploration of the sea, designing of bio-medical equipment, etc. A course in Robotics trains and educates a student in the field of artificial intelligence, computer-aided manufacturing, computer integrated manufacturing system, computational geometry, robot motion planning, digital electronics and micro processing. One can expect jobs at manufacturing industries, NASA, private industries, automobiles, appliance and industrial tools. The students who study robotics technologies at a college or technical school are prepared for careers in robot technology, computer controlled machine programming, robotic sales and more. The candidates may pursue higher degrees in Robotics and Automation Engineering, Ph.D degrees in reputed National and International Institutes / Universities.

**Unique Features:**

The Department has been recognized as Research and Development Centre by Srinivas University for carrying out Research activities leading to Ph.D. Degrees. The department offers UG program namely, B.Tech. (Mechanical Engineering), and B.Tech. (Robotics, Artificial Intelligence & Machine Learning) in addition to the PG programmes M.Tech. Robotics & Automation, M.Tech. Computer Integrated Manufacturing, and M.Tech. Thermal Power Engineering. At present, the department has Ph.D. scholars working on Nanomaterials, Composites, Alternative fuels etc.

Being a private university, we have a feasibility to form our own syllabus. Thus we have approached several industrialists and have framed the syllabus according to the industry requirements and prepared an Industry oriented syllabus.

The students of the department will undergo internship in various reputed organizations all over the country. The students participate in various National and International level competitions, events regularly. The department possesses the state of the art research facilities to support the academic programs and research. Several projects of the students have been funded by the Government of Karnataka.

The department has a distinguished record in both teaching and research. The faculty members have excellent academic credentials and are highly regarded. They have publications at National and International levels. Several faculty members serve on the editorial boards of national and international journals, review technical articles for journals on a regular basis and organize conferences and workshops.

**Course Structure:**

SEMESTER 1		SEMESTER 2	
Sl. No.	Subject	Sl. No.	Subject
1	Computational Mathematics	1	Mobile Robots
2	Robotics Engineering	2	Embedded Systems Design
3	Introduction to Electrical and Electronics Systems	3	Artificial Intelligence
4	Control System	4	Pneumatic and Hydraulic Control
5	Mechatronics Systems and Applications	5	Elective II
6	Elective I	6	Elective III
7	Lab-I	7	Lab-II
8	Seminar	8	Seminar

Sl. No.	Elective I – 1 <sup>st</sup> Semester	Sl. No.	Elective II – 2 <sup>nd</sup> Semester	Sl. No.	Elective III – 2 <sup>nd</sup> Semester
1	Robotics Based Industrial Automation	1	Image Processing	1	Robot Programming
2	Computer Aided Modeling and Design	2	CAD/CAM	2	Digital control
3	Introduction to Wireless Networks	3	Instrumentation and Sensors	3	Advanced Control System
4	Digital System Design	4	Programming and Data Structure	4	MEMS and Microsystems
5	Signal Processing	5	Advanced Manufacturing Systems	5	Machine learning

SEMESTER 3		SEMESTER 4	
Sl. No.	Subject	Sl. No.	Subject
1	Seminar/Presentation on Internship (After 8 weeks from the date of commencement)	1	Project Work Phase: 1
2	Report on Internship	2	Report on Project work
3	Evaluation and Viva-Voce	3	Final Evaluation of Project Work and Viva-Voce

## Internship

1. **Internship:** All the students shall have to undergo mandatory internship of 16 weeks during III semester and University examination shall be conducted at the end of 16 weeks. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared as failed and have to complete during the subsequent University examination after satisfying the internship requirements.
2. **Seminar /Presentation of Internship:** Students in consultation with the guide/co-guide if any, shall prepare and present a seminar after 8 weeks of Internship. IA marks shall be awarded by a committee comprising of HOD as Chairman, Guide/co-guide if any, and a senior faculty of the department. The IA marks awarded for Seminar/Presentation on Internship, shall be based on the evaluation of Internship Report, Presentation skill and Question and Answer session.
3. **Evaluation and Viva-Voce:** Students in consultation with the guide/co-guide if any, shall prepare relevant Internship report, and present a seminar at the end of 16 weeks. IA marks shall be awarded by a committee comprising of HOD as Chairman, Guide/co-guide if any, and a senior faculty of the department based on the evaluation of Internship Report, Presentation skill and Question and Answer session. Examination marks shall be awarded by External Guide and the Internal Guide/co-guide if any, based on the evaluation of Internship Report, Presentation skill and Question and Answer session.

## Project Work

1. **Project Phase-1:** Students in consultation with the guide/co-guide if any, shall pursue literature survey and complete the preliminary requirements of selected Project work. Each student shall prepare relevant introductory project document, and present a seminar. IA marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide if any, and a senior faculty of the department. The IA marks awarded for project work phase:1, shall be based on the evaluation of Project Report, Project Presentation skill and Question and Answer session.
2. **Final Evaluation of Project Work and Viva-Voce:** Students in consultation with the guide/co-guide if any, shall prepare relevant project report, and present a seminar. IA marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide if any, and a senior faculty of the department based on the evaluation of Project Report, Project Presentation skill and Question and Answer session. Examination marks shall be awarded by External Guide and the Internal Guide/co-guide if any, based on the evaluation of Project Report, Project Presentation skill and Question and Answer session.



**College of Engineering & Technology**

CREATING INNOVATORS



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**Educating the Next Generation**

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