Certified Workshop on Introduction to Robotics

5 Day Certified Workshop

3 Jan- 7 Jan, 2022

ORGANIZED BY
MECHANICAL DEPARTMENT
UNDER IQAC INITIATIVE

VISHWATMAK OM GURUDEV COLLEGE OF ENGINNERING

[Affilliated to MSBTE, Mumbai , Approved by AICTE, New Delhi & DTE, M.S.]

At: Mohili, Post: Aghai, Via Kalyan , Dist.: Thane, 421301

RESOURCE PERSON: MR. ANWESH VIRKUNWAR

COURSE OBJECIVES:

- TO PROVIDE AN INTRODUCTION TO ROBOTICS AND AUTOMATION INCLUDING ROBOT CLASSIFICATION, DESIGN AND SELECTION, ANALYSIS AND APPLICATIONS IN INDUSTRY.
- TO PROVIDE INFORMATION ON VARIOUS TYPES OF END EFFECTORS, THEIR DESIGN, INTERFACING AND SELECTION.
- TO PROVIDE THE DETAILS OF OPERATIONS FOR A VARIETY OF SENSORY DEVICES THAT ARE USED ON ROBOT , THE MEANING OF SENSING, CLASSIFICATION OF SENSOR, THAT MEASURE POSITION, VELOCITY & ACCELERATION OF ROBOT JOINT.
- TO FAMILIARIZE THE BASIC CONCEPTS OF TRANSFORMATIONS PERFORMED BY ROBOT.
- TO PERFORM KINEMATICS AND TO GAIN KNOWLEDGE ON PROGRAMMING OF ROBOTS.

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KKMANIAYRVOGCE@GMAIL.COM
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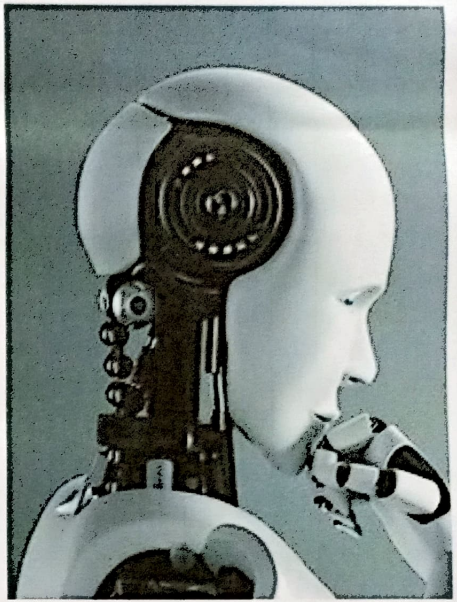
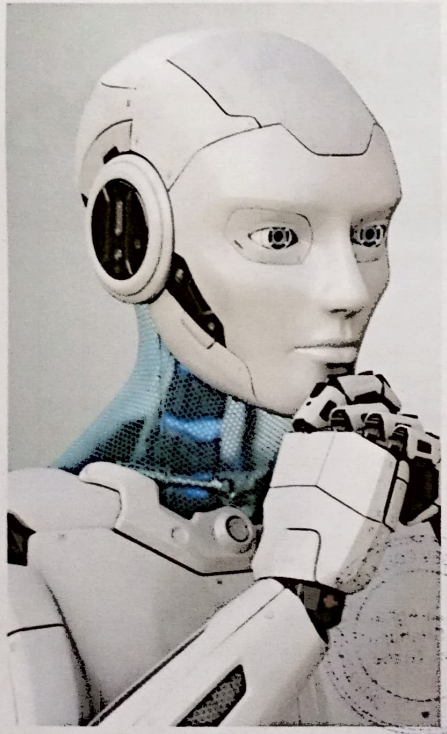


COURSE OUTCOMES:

- THE STUDENTS ARE ABLE TO:
- UNDERSTAND BASIC COMPONENTS OF ROBOTICS, CLASSIFICATION OF ROBOTS AND THEIR APPLICATIONS.
- KNOW ABOUT TYPES OF ROBOT GRIPPERS, THEIR USAGE AND DESIGN CONSIDERATIONS.
- UNDERSTAND ABOUT VARIOUS TYPES OF SENSORY DEVICES, THEIR WORKING AND APPLICATIONS.
- APPLY BASIC TRANSFORMATIONS RELATED TO THE MOVEMENT OF THE MANIPULATOR.
- DESIGN A ROBOT MECHANISM TO MEET KINEMATICS REQUIREMENTS AND TO WRITE SIMPLE PROGRAMS.

COURSE PREREQUISITES

- TO GET FULL BENEFIT OF THIS COURSE, STUDENTS NEED TO HAVE BASIC IDEA PROGRAMMING AND MATHEMATICS.
- BASIC IDEA ABOUT SENSORS AND ACTUATORS AND MICROCONTROLLERS.

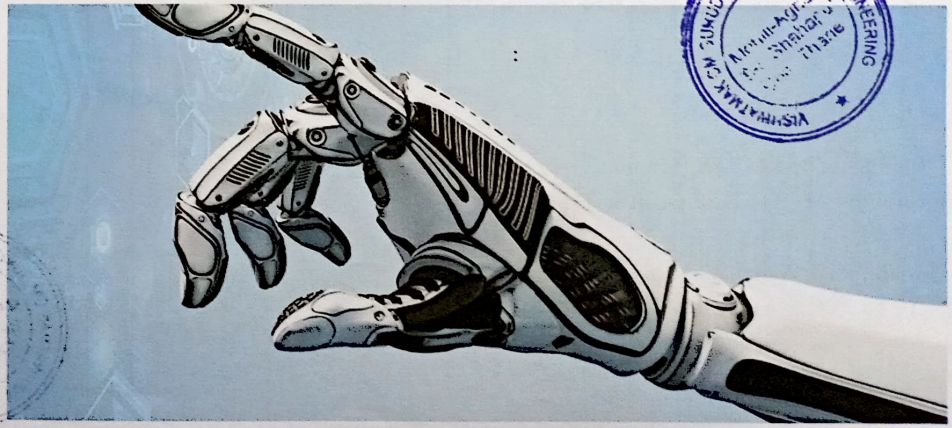


COURSE CONTENTS

- INTRODUCTION TO ROBOTICS
- BASICS OF ROBOTICS
- MECHANICAL WORKING
- INTRODUCTION TO MICROCONTROLLERS
- BASIC PROGRAMMING
- INTRODUCTION TO SENSORS

CAREER PROSPECTS:

THE FIELD OF ROBOTICS HAS A VERY BRIGHT FUTURE AHEAD, AND SOON THERE WILL BE A GREAT INCREASE IN THE USE OF SOPHISTICATED ROBOTS THAT WILL WORK IN COLLABORATION WITH HUMANS. ROBOTS WILL INCREASE ECONOMIC GROWTH AND PRODUCTIVITY AND CREATE NEW CAREER OPPORTUNITIES FOR MANY PEOPLE WORLDWIDE. THE BEST THING ABOUT ROBOTS IS THAT THEY WILL NOT REPLACE HUMAN WORKERS, BUT WILL HELP THEM IN THEIR WORK. THEREFORE IF YOU AIM TO HAVE A GREAT CAREER IN ROBOTICS THIS COURSE WILL BE OF GREAT HELP.



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Name of Course	:	**Introduction to Robotics**		
Duration	:	30 Hrs.	Modules :	6

Course Objectives :

- To provide an introduction to Robotics and Automation including robot classification, design and selection, analysis and applications in industry.
- To provide information on various types of end effectors, their design, interfacing and selection.
- To provide the details of operations for a variety of sensory devices that are used on robot , the meaning of sensing, classification of sensor, that measure position, velocity & acceleration of robot joint.
- To familiarize the basic concepts of transformations performed by robot.
- To perform kinematics and to gain knowledge on programming of robots.

Course Outcomes :

- **The students are able to:**
  - Understand basic components of robotics, classification of robots and their applications.
  - Know about types of robot grippers, their usage and design considerations.
  - Understand about various types of sensory devices, their working and applications.
  - Apply basic transformations related to the movement of the manipulator.
  - Design a robot mechanism to meet kinematics requirements and to write simple programs.

Course Prerequisites :

- To get full benefit of this course, students need to have basic idea Programming and Mathematics.
- Basic idea about Sensors and Actuators and Microcontrollers.

Career Prospects:

The field of robotics has a very bright future ahead, and soon there will be a great increase in the use of sophisticated robots that will work in collaboration with humans. Robots will increase economic growth and productivity and create new career opportunities for many people worldwide. The best thing about robots is that they will not replace human workers, but will help them in their work. Therefore if you aim to have a great career in Robotics this course will be of great help.

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Course Contents		
Module-1 :	**Duration :**	**5 hours**
Introduction to Robotics: Brief history, Existing robotics applications and types of robots, Robotics as a field and its constituents, Control theory (Kinematic and dynamic), Cybernetics, AI, Sensors.		
Module-2 :	**Duration :**	**5 hours**
Basics of Robotics: Locomotion, Tyres, Power Supplies, Transmission Systems, Good Engineering Practices, Basic Electrical Control System, General idea of PCB's and Related Software's.		
Module-3 :	**Duration :**	**5 hours**
Mechanical Working: Differential drive system, Differential drives kinematics, Differential drive dynamics, Dead reckoning, Actuators, Control Of Servos, and Motor Driver.		
Module-4 :	**Duration :**	**5 hours**
Introduction To Microcontrollers: Architecture, Functioning, Overview of available microcontrollers, Features and capabilities will be studied in depth, Functioning and use of RS-232.		
Module-5:	**Duration :**	**5 hours**
Basic Programming: Microcontroller Programming, In System Programming, Programming the chip, How to program a microcontroller to generate PWM, LCD Interfacing, Controlling H-bridge, Developing algorithms for Intelligent ROBOTS and writing programs for the same.		
Module-6 :	**Duration :**	**5 hours**
Introduction To Sensors: Types And Functioning Of Sensors, Hands- On Assembling The Advanced Obstacle Avoider, Assembling The Advanced Line Follower, Assembling The Wall Follower, Some Applications Of Mobile Robotics.		

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VISHWATMAK OM GURUDEV COLLEGE OF ENGINEERING

Department of Mechanical Engineering

ADD ON Program on Introduction to Robotics

ADD ON Attendance

Sr No.	Students Name	03/01/2022		04/01/2022		05/01/2022		06/01/2022		07/01/2022				Remark
		Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8	Session 9	Session 10			
1	Goswami Munna													
2	Salunkhe Dashrath Nivrutti													
3	Wakle Pravin Natha													
4	Rai prince pradip				AB				AB					
5	Manjare Akash													
6	Saurabh bhere						AB							
7	Patil Jidhnesh Ankush						AB							
8	Kashivale Rohit Gurunath													
9	Gaikar Amol Ramesh													
10	Randhe Roshan Vishnu													
11	Gharat Manish Vishwanath													
12	Gharat Ashish Subhash													
13	Jadhav Suraj Balu													
14	Aatar Jasmin Asif													
15	Farde Milind Balu													
16	Rindani Chiranshi Kalpendu													
17	Patil Swapnil Suresh													
18	Shelar Akshay Dattatrey													
19	Bhoyar v Arpit								AB					
20	Patil Sanket Vijay													
21	Jadhav Harshad Sitaram													
22	Patil Nirag Rajendra													
23	Bhoir Viresh Suresh													
24	Patel Jagdish Ramraj													
25	Thakare Vilas Ashok													
26	Pachghare Prashant													
27	Paradhi Sameer Dinakar													
28	Mishra Harsh Ashok													

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29	Thokale prashant gopal	Prashant	Prashant	Prashant	Prashant	Prashant	Prashant	Prashant	Prashant	Prashant	Prashant		
30	Patil Yash Santosh	Y Patil	Y Patil	Y Patil	Y Patil	Y Patil	Y Patil	Y Patil	Y Patil	Y Patil	Y Patil		
31	Pranjal Dilip Kumavat	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.		
32	Thakare Girish Suresh	Girish	Girish	Girish	Girish	Girish	Girish	Girish	Girish	Girish	Girish		
33	Deshmukh Ajinkya Umakant	A Deshmukh	A Deshmukh	A Deshmukh	A Deshmukh	A Deshmukh	AB	A Deshmukh	A Deshmukh	A Deshmukh	A Deshmukh		
34	Mahale Hemlata Raghunath	Hemlata	Hemlata	Hemlata	Hemlata	Hemlata	Hemlata	Hemlata	Hemlata	Hemlata	Hemlata		
35	Bhoir Pooja Raghunath	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir		
36	Chaudhari Chandan Vilas	2	2	2	2	2	2	2	2	2	2		
37	Chile Girish Rajendra	Girish	Girish	Girish	Girish	Girish	AB	Girish	Girish	Girish	Girish		
38	Dalvi Nitin Pandharinath	Nitin	Nitin	Nitin	Nitin	Nitin	Nitin	AB	AB	Nitin	Nitin		
39	Sapat Suraj Vijay	Suraj	Suraj	Suraj	Suraj	Suraj	Suraj	Suraj	Suraj	Suraj	Suraj		
40	Thakare Shivam Tanaji	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	AB	AB	Shivam	Shivam		
41	Patare Tejas Dattatray	Tejas	Tejas	Tejas	Tejas	Tejas	Tejas	Tejas	Tejas	Tejas	Tejas		
42	Khale Sumit Suresh	Sukhale	Sukhale	Sukhale	Sukhale	Sukhale	Sukhale	Sukhale	Sukhale	Sukhale	Sukhale		
43	Bhoir Pranay Rajendra	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir	Bhoir		
44	Chaudhari Pranav	Pchaudhari	Pchaudhari	Pchaudhari	AB	Pchaudhari	Pchaudhari	Pchaudhari	Pchaudhari	Pchaudhari	Pchaudhari		
45	Khanjode Shubham	Shu.	Shu.	Shu.	Shu.	Shu.	Shu.	AB	AB	Shu.	Shu.		
46	Mestry Chinmay	Cmestry	Cmestry	Cmestry	Cmestry	Cmestry	Cmestry	Cmestry	Cmestry	Cmestry	Cmestry		
47	Ghodvinde Nikhil	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG		
48	Gotarne Sarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh	Gsarvesh		
49	Toke Aniket	Aatoke	Aatoke	Aatoke	Aatoke	Aatoke	Aatoke	Aatoke	Aatoke	Aatoke	Aatoke		
50	Sambre Sandesh	RNK	RNK	RNK	RNK	RNK	RNK	RNK	RNK	RNK	RNK		
51	Chaudhari Devesh	Dchaudhari	Dchaudhari	Dchaudhari	Dchaudhari	AB	AB	Dchaudhari	Dchaudhari	Dchaudhari	Dchaudhari		
52	Chaudhari Dhiraj	Dchaudhari	Dchaudhari	AB	AB	Dchaudhari	Dchaudhari	Dchaudhari	Dchaudhari	Dchaudhari	Dchaudhari		
53	Sable Sandesh	Sable	Sable	Sable	Sable	Sable	Sable	Sable	Sable	Sable	Sable		
54	Penta Vikrant	Penta	Penta	AB	AB	Penta	AB	Penta	AB	Penta	AB		
55	Prajapati Vijay	10	10	10	10	10	10	10	10	10	10		
56	Gharat Harshal	Mgharat	Mgharat	Mgharat	Mgharat	Mgharat	Mgharat	Mgharat	Mgharat	Mgharat	Mgharat		
57	Shedge Prashant	Pshedge	Pshedge	Pshedge	Pshedge	Pshedge	Pshedge	Pshedge	Pshedge	Pshedge	Pshedge		
58	Lodhe Harshal	Lodhe	Lodhe	Lodhe	Lodhe	Lodhe	Lodhe	Lodhe	Lodhe	Lodhe	Lodhe		
59	Lokre Jash	Jlokre	Jlokre	AB	AB	Jlokre	AB	AB	Jlokre	Jlokre	Jlokre		
60	Bhovare Sahil Santosh	Sbhovare	Sbhovare	Sbhovare	Sbhovare	Sbhovare	Sbhovare	Sbhovare	Sbhovare	Sbhovare	Sbhovare		
61	Kalaskar Shubham Subhash	Skalaskar	Skalaskar	Skalaskar	Skalaskar	Skalaskar	Skalaskar	Skalaskar	Skalaskar	Skalaskar	Skalaskar		
62	Muknak Suraj Subhash	Smuknak	Smuknak	Smuknak	Smuknak	Smuknak	Smuknak	Smuknak	Smuknak	Smuknak	Smuknak		

Program Coordinator

HOD

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Department of Mechanical Engineering

One Page Activity Report

- **Faculty Name** – Prof. Saurabh Dhone
- **Date** –03/01/2022-07/01/2022 Timing 10.00AM-05.00 PM
- **Planned Activity – ADD On Program on Introduction to Robotics**
- **Permission from Authorities** – Dr. D. D. Shinde (Principal)
- **Implementation Details** – The purpose of the workshop is to provide students an introduction to Robotics and Automation including robot classification, design and selection, analysis and applications in industry as well as to provide information on various types of end effectors, their design, interfacing and selection. Through this workshop students are able to understand basic components of robotics, classification of robots and their applications. Students learnt about types of robot grippers, their usage and design considerations. They understand various types of sensory devices, their working and applications. Students applied basic transformations related to the movement of the manipulator.
- **Conclusion** – After completion, this workshop we conclude that students get more benefits from this workshop and they are more familiar with robotic technology . The field of robotics has a very bright future ahead, and soon there will be a great increase in the use of sophisticated robots that will work in collaboration with humans. Robots will increase economic growth and productivity and create new career opportunities for many people worldwide. The best thing about robots is that they will not replace human workers, but will help them in their work. We are very thankful to our Head of Department for giving such good support as well as we are also especially thankful to our President sir and Principal Sir that he was continuously guiding and supporting us.
- **Feedback Report-** Attached
- **Completion Report -**Workshop Successfully completed on 07/01/2022

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Department of Mechanical Engineering

Coordinator **HOD** **Principal**

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COLLEGE OF ENGINEERING

CERTIFICATE

OF COMPLETION

This is to certify that

Mr./Ms **Patil Yash Santosh** of Class SE/TE/BE Mechanical Engineering has successfully completed the ADD On Course titled " **Introduction to Robotics**" organised by Mechanical Engineering Department from 03/01/2022 to 07/01/2022.

COURSE INSTRUCTOR	PROGRAM COORDINATOR	HOD	PRINCIPAL

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OF COMPLETION

This is to certify that

Mr./Ms **Thakare Girish Suresh** of Class SE/TE/BE Mechanical Engineering has successfully completed the ADD On Course titled " **Introduction to Robotics**" organised by Mechanical Engineering Department from 03/01/2022 to 07/01/2022.

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This is to certify that

Mr./Ms **Patil Sanket Vijay** of Class SE/TE/BE Mechanical Engineering has successfully completed the ADD On Course titled "**Introduction to Robotics**" organised by Mechanical Engineering Department from 03/01/2022 to 07/01/2022.

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OF COMPLETION

This is to certify that

Mr./Ms **Khanjode Shubham** of Class SE/TE/BE Mechanical Engineering has successfully completed the ADD On Course titled " **Introduction to Robotics**" organised by Mechanical Engineering Department from 03/01/2022 to 07/01/2022.

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OF COMPLETION

This is to certify that

Mr./Ms **Wakle Pravin Natha** of Class SE/TE/BE Mechanical Engineering has successfully completed the ADD On Course titled " **Introduction to Robotics**" organised by Mechanical Engineering Department from 03/01/2022 to 07/01/2022.

COURSE INSTRUCTOR	PROGRAM COORDINATOR	HOD	PRINCIPAL

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