Vishnu Waman Thakur Charitable Trust's
VIVA Institute of Technology
Approved by AICTE, New Delhi, DTE, Government of Maharashtra, Affiliated to University of Mumbai
At- Shirgaon, Post-Virar (E.), Tal-Vasai, Dist-Palghar – 401 305.
Tel.: 777 000 2544 • Website : www.viva-technology.org
E-mail: contact@viva-technology.org / principalvit@vivacollege.org

Department of Electronics and Telecommunication Engineering

Course Name:	Introduction to Robotics Prototyping
Name of the Faculty:	Mrs. Sonali Gaikwad
Designation:	**Assistant Professor**
Organization/Institution:	**Viva Institute of Technology**
Duration:	7th January 2026 to 21st April 2026
Time:	**30 hours**
Number of Students:	51

Course Objectives:

1. To introduce the fundamentals of robotics, robotic systems, and their applications in industry and research.
2. To familiarize students with serial manipulators and robot teaching techniques used in robotic automation.
3. To develop understanding of robotic motion control and navigation for mobile robots and drones.
4. To explain path and gait planning concepts for legged and humanoid robotic systems.
5. To provide practical exposure to robotic prototyping platforms such as UR5 manipulators and NAO humanoid robots.
6. To encourage students to explore recent advancements and research trends in robotics and intelligent systems.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain the basic concepts, components, and classifications of robotic systems.
2. Demonstrate robot teaching and operation of serial manipulators for simple robotic tasks.
3. Apply motion control and navigation techniques for mobile robots and drones.
4. Analyze path and gait planning methods used in legged and humanoid robots.
5. Develop basic robotic prototypes using modern robotic platforms and control techniques.
6. Identify emerging trends and research opportunities in robotics, automation, and intelligent systems.

Vishnu Waman Thakur Charitable Trust's
VIVA Institute of Technology
Approved by AICTE, New Delhi, DTE, Government of Maharashtra, Affiliated to University of Mumbai
At- Shirgaon, Post-Virar (E.), Tal-Vasai, Dist-Palghar – 401 305.
Tel.: 777 000 2544 • Website : www.viva-technology.org
E-mail: contact@viva-technology.org / principalvit@vivacollege.org

Programme Summary:

Duration: 30 Hours
Venue: VIVA Institute of Technology, Shirgaon.

Electronics & Telecommunication Engineering Department of VIVA Institute of Technology organi zed a 30 hours' Bridge course on "**Introduction to Robotics Prototyping**" during 7th January 2026 to 21st April 2026 conducted by Mrs. Sonali Gaikwad.

The bridge course *"Introduction to Robotics Prototyping"* was conducted to provide students with foundational and practical knowledge in robotics engineering. The course covered various robotic platforms including industrial manipulators, tracked mobile robots, drones, six-legged robots, and humanoid robots. Special emphasis was given to path and gait planning techniques for advanced robotic systems such as hexapod and NAO humanoid robots. The course also exposed students to drone navigation concepts and modern industrial robotic platforms like the UR5 robot. In addition, discussions on current trends in robotics research helped students understand emerging technologies such as autonomous systems, AI-enabled robotics, and human–robot interaction. Overall, the course successfully enhanced students' technical understanding, practical skills, and interest in robotics prototyping and research-oriented applications.

The event was a success with very positive feedback from the participants. The speech by the Principal Dr. Arun Kumar was an inspiring one that covered the broad future scopes of the field. The Principal being an encouraging one who said that for such events where in student development is involved, he will always be supportive. In the speech given by Mrs. Archana Ingle, H.O.D of EXTC, students gained an idea of how this course can be utilized to take creative projects in the field of engineering.

Topics covered in the course:

Sr.no	Contents	Hrs.
1	Introduction to Robot and Robotics	02
2	Introduction to Serial Manipulators	02
3	Teaching of Serial Manipulator	02
4	Teaching of Serial Manipulator	02
5	Universal robot: UR5	02
6	Control of Tracked Mobile Manipulator	02
7	Control of Tracked Mobile Manipulator	02
8	Hexapod Robot	02
9	Path & Gait Planning of Six-legged Robot	02
10	Path & Gait Planning of Six-legged Robot	02
11	Navigation of Drone	02
12	Navigation of Drone	02
13	Path & Gait Planning of 25 DOF NAO Humanoid Robot	02
14	Path & Gait Planning of 25 DOF NAO Humanoid Robot	02
15	Current Trends in Robotics Research	02

CO-PO Mapping:

Course Outcome	Program Outcome												
	PO 1	PO 2	PO 3	PO 4	P0 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	CO Target level
CO1	3	2	2	2	2	-	-	-	-	-	-	-	2.2
CO2	3	2	2	2	2	-	-	-	-	-	-	-	2.2
CO3	3	3	2	2	2	-	-	-	-	-	-	-	2.4
CO4	3	3	3	2	2	-	-	-	-	-	-	-	2.6
CO5	3	3	2	2	2	-	-	-	-	-	-	-	2.4
CO6	3	2	2	2	2	-	-	-	-	-	-	-	2.2

Student Certificate format:

Vishnu Waman Thakur Charitable Trust's
VIVA Institute of Technology
Approved by AICTE, New Delhi, DTE, Govt. of Maharashtra and Affiliated to the University of Mumbai
Shirgaon, VirarE.), Dist: Palghar-401305, Maharashtra
NAAC "B++" GRADE

Certificate of Appreciation

This is to certify that

Shrusti Vasant Jadhav

Student of **Electronics and Telecommunication Engineering department** has successfully completed bridge course on "**Introduction to Robotics Prototyping**" conducted during 7th January 2026 to 21st April, 2026 at

VIVA Institute of Technology, Shirgaon.

His / Her contribution is highly appreciated.

(Mrs. Archana Ingle)
HEAD OF DEPARTMENT

(Dr. Arun Kumar)
Principal