

Unati Global Connect Private Limited (UGCPL)
| Integrity | Sanctity | Commitment |

**45 DAYS/ONE MONTH ONLINE INTERNSHIP PROGRAM POWERED BY
UGCPL**



ROBOTICS

Important information related to 45/30 Days Internship Program

- ✚ On registration confirmation, a common whatsapp group will be formed, where the students will be getting all necessary updates including the joining link (MS Teams / Google Meet/Webex) for online sessions.
- ✚ Two-hours online session 3/4 days- per week will be held from 3.30 pm to 5.30 pm or 4:00 pm to 6:00 pm regularly on alternate days basis. Timing schedule/number of days per week may change on request of majority of the participants
- ✚ 25 % of the allocated time will be for real time project work implementation.
- ✚ Project work will be in group of students (group will be consisting of a maximum of 8 students).
- ✚ Submission of complete project report by the participant is mandatory for the Internship Certification– One copy of the project report needs to be submitted at the parent Institution/Department and another copy will be required to be submitted to UGCPL Training Team.
- ✚ Software based project work will be free of cost and sufficient requirement for the Internship Certification.
- ✚ Upon submission of project report in the concerned parent Institute/Department, the participants will be able to download their Internship Certificates within 10 to 15 working days from our website (www.ugcpl-india.com). The hard copy of the certificates will be submitted to the T&P Cell of the concerned University/Institute by UGCPL within 20 days time period.
- ✚ The participants will have to make their own arrangement of resources like Laptop or PC or smart phone and internet connectivity for attending the sessions through MS Teams/Google Meet/Webex platform.

HOW TO REGISTER

Reg. Office: Ranchi-Purulia Road, Tatisilwai, Jharkhand- 835103
E-mail:- info@ugcpl-india.com Contact: - +91 9931444441

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Please follow the following steps for successfully registering in our Training-cum-Internship program.

Step 1: Please select the area of Internships-cum-Industrial training you wish to enrol.

Step 2: Visit our website www.ugcpl-india.com

Step 3: Click on **Register Now** tab in top right corner given in our website by paying the necessary fees. OR you can also click in the given link: <https://www.ugcpl-india.com/register.aspx>

Step 4: You will receive confirmation of payment in e-mail post successful payment within 3 days.

Step 5: You will receive the Whatsapp Group Link for your specific batch/areas of Internship at least 3 days prior to start of Internship through e- mail. Please provide correct e-mail address during registration

Step 6: You will receive the class joining link and schedule details over whatsapp group as well as in your registered e-mail address.

Step 7: Once you have successfully completed the Internship programme and submitted the project report, you will be able to download your Internship Certificate.

Course Structure/Schedule of the Internship on **ROBOTICS**

Course Description:

This course comprehensively explains robotics, blending theoretical concepts with hands-on applications. Participants will explore microcontrollers, sensors, actuators, communication protocols, and real-time operating systems (RTOS). The course introduces robotics fundamentals, including kinematics, control systems, and navigation. Through practical labs and projects, learners will design, program, and debug embedded systems for robotic applications in online learning mode with all live sessions. Advanced topics such as IoT integration, machine learning in robotics, and autonomous systems will also be covered. This course equips participants with the technical expertise and problem-solving skills required to excel in the rapidly evolving embedded systems and robotics industry.

Prerequisites:

- Basic knowledge of electronics and circuits.
- Programming experience in C/C++ or Python.
- Understanding of basic mathematics and algorithms.
- Familiarity with microcontrollers (preferred but not mandatory).

SYLLABUS

Module I: Introduction to Robotics

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Overview and basics of robotics, embedded systems, microcontrollers vs. microprocessors, applications, types of robots, robotic systems architecture

Module II: Microcontroller Architecture

AVR, ARM, PIC architectures, memory mapping, I/O ports, timers

Module III: Programming Microcontrollers

C/C++ for embedded systems, GPIO, interrupts, timers, PWM

Module IV: Sensors and Actuators

Analog and digital sensors, interfacing, motor drivers, servo motors, DC motors

Module V: Communication Protocols

UART, I2C, SPI, CAN protocols, wireless communication basics

Module VI: Real-Time Operating Systems (RTOS)

Concepts of RTOS, task scheduling, synchronization, and inter-task communication

Module VII: Robot Kinematics and Dynamics

Forward and inverse kinematics, trajectory planning

Module VIII: Motor Control and Actuation

PID control, motor interfacing, motion control algorithms

Module IX: Sensor Integration and Feedback

Sensor fusion, real-time feedback, sensor calibration

Module X: Embedded IoT for Robotics

IoT architecture, cloud communication, MQTT, HTTP protocols

Module XI: AI and Machine Learning in Robotics

Basics of ML, vision-based navigation, object recognition

Module XII: Autonomous Navigation and Mapping

SLAM, path planning, obstacle avoidance

PROJECT WORK FOLLOWED BY DOCUMENTATION AND PROJECT REPORT SUBMISSION