

AUTONOMOUS ROBOTIC ENGINEER PROFESSIONAL TRACK

From Mechanical Design to Intelligent Autonomy — design, simulate, and
deploy production-ready robots



**DESIGN, SIMULATE, AND DEPLOY PRODUCTION-READY
ROBOTS ACROSS EMBEDDED CONTROL, ROS 2
NAVIGATION, DIGITAL TWINS, AND EDGE AI.**

PROFESSIONAL PROGRAM • 6 MONTHS

AUTONOMOUS ROBOTIC ENGINEER PROFESSIONAL TRACK

design, simulate, and deploy production-ready robots across embedded control, ROS 2 navigation, digital twins, and edge AI.

DURATION:
6 MONTHS • 10+ LAB HOURS

FORMAT & MODE
HYBRID LMS + LIVE

SKILL LEVEL
GRADUATE / PROFESSIONAL

ROBOTICS SPECIALIZATION TRACKS

Deep dive into four career paths aligned with demanding robotics engineering profiles.

Track 01 Robot Design & Embedded Control

Mechanical kinematics, PCB design, and real-time firmware.

- Mobile Robot Design & CAD
- Embedded Controller Dev
- Real-Time Control Systems

Track 02 ROS 2 Sensor Fusion & Navigation

Master the industry-standard framework for robot software.

- Advanced ROS 2 Middleware
- Sensor Fusion & SLAM
- Autonomous Navigation Stack

Track 03 Digital Twins & Reinforcement Learning

High-fidelity simulation to train intelligent agents safely.

- Digital Twin Development
- RL Foundations
- Sim-to-Real Transfer

Track 04 Embedded AI & Robotic Perception

Computer vision and deep learning on edge hardware.

- Embedded AI Hardware
- Deep Learning Perception
- Deployment & Optimization

INDUSTRY-GRADE TOOLCHAIN YOU'LL MASTER

'ROS2','GAZEBO','NVIDIA','FREERTOS','FUSION360','TENSORRT','ONNX','NAV2','
PYTORCH','STM32','JETSON','OPENCV','DOCKER','PID','SLAM'

TRACK 01 ROBOT DESIGN & EMBEDDED CONTROL

Mobile Robot Design & CAD

- checkChassis design & materials selection
 - checkKinematic modeling for mobile bases
 - checkCAD for manufacturability (DFM)
- ### Embedded Controller Development
- checkSTM32 microcontroller architecture
 - checkGPIO, ADC/DAC, timers, DMA
 - checkSensor interfacing via I2C/SPI/CAN

Motion Control Systems

- checkPID and closed-loop motion control
 - checkState estimation with IMU & encoders
 - checkBLDC/Stepper motor driver integration
- ### FreeRTOS Robot Controller
- checkReal-time task scheduling
 - checkInter-task communication (queues/semaphores)
 - checkSafety watchdogs and fail-safes



Capstone Milestone 1: Differential-Drive Mobile Robot Build

Full mechanical design, motor control, sensor suite integration, and closed-loop motion control with FreeRTOS firmware.

TRACK 02 ROS 2 SENSOR FUSION & NAVIGATION

Linux for Robotics & ROS 2

- checkUbuntu & Linux fundamentals
 - checkROS 2 nodes, topics, services & actions
 - checkDDS middleware & quality of service
- ### Real-Time Linux Integration
- checkPREEMPT_RT kernel basics
 - checkReal-time constraints & latency tuning
 - checkHardware-software integration patterns

Robot Description & Sensors

- checkURDF & Xacro robot modeling
 - checkTF (transform) tree management
 - checkLIDAR, IMU & camera driver integration
- ### Localization, Mapping & Nav
- checkSLAM with Cartographer/GMapping
 - checkParticle & Kalman filter fusion (EKF)
 - checkNav2 path planning & behavior trees



Capstone Milestone: Full-Stack ROS 2 Navigation System

End-to-end ROS 2 navigation stack: sensor fusion for localization, SLAM map build, global/local planners with Nav2, and obstacle avoidance for a differential-drive robot.

TRACK 03 DIGITAL TWINS & REINFORCEMENT LEARNING

Robot Simulation & Digital Twins

- checkModel fidelity & physics tuning
 - checkSensor emulation workflows
 - checkDigital twin development pipelines
- ### Sensor & Environment Modeling
- checkSynthetic sensor generation
 - checkNoise models for realistic data
 - checkProcedural environment generation

Reinforcement Learning

- checkRL fundamentals & Markov decision processes
 - checkReward shaping strategies
 - checkPolicy & value-based methods
- ### Deep RL & Sim-to-Real
- checkDeep RL with PPO, SAC & TD3
 - checkDomain randomization techniques
 - checkSim-to-Real transfer & hardware fine-tuning



Capstone Milestone: Sim-to-Real RL Pipeline for Obstacle Avoidance

Train an RL agent in simulation for navigation or manipulation and deploy to hardware with domain adaptation and transfer learning techniques.

TRACK 04 EMBEDDED AI & ROBOTIC PERCEPTION

Embedded AI Computing Platforms

- checkNVIDIA Jetson architecture
 - checkGoogle Coral & Edge TPU
 - checkPower & performance tradeoffs
- ### Intelligent Robotic Perception
- checkObject detection (YOLO family)
 - checkSemantic segmentation pipelines
 - checkMulti-sensor fusion for perception

AI Deployment & Optimization

- checkModel pruning & quantization
 - checkONNX conversion & interoperability
 - checkTensorRT acceleration & benchmarking
- ### Autonomous Robotic Applications
- checkEnd-to-end application design
 - checkSafety & fail-safe mechanisms
 - checkUser interfaces & teleoperation



Capstone Milestone: Real-Time Perception on Edge Hardware

Train a detection model, optimize and deploy on Jetson/Coral with ROS 2 integration for real-time inference in a robotic system.

BRIDGE THE GAP FROM LEARNING AI TO PRODUCTION-READY COMPUTER VISION ENGINEER

Transform from learning isolated AI concepts to building and deploying real-world Computer Vision solutions in just 12 weeks.



WHERE YOU START

01 | Fragmented Knowledge

Skills scattered across coding, hardware, and theory.

02 | Sim-to-Real Failures

Robots work in simulation but break on hardware

03 | No Production Experience

Limited understanding of industry-grade systems



WHERE YOU'LL BE

✓ Full-Stack Robotics Engineer

Design, build, and deploy complete autonomous systems.

✓ Production-Ready AI

Deploy optimized ML models on edge hardware confidently

✓ Portfolio of Real Projects

5+ capstone projects ready for hiring managers

**READY TO MAKE THIS TRANSFORMATION ?
JOIN 2,400+ ENGINEERS WHO ALREADY MADE THE LEAP.**

INSIGHTS FROM OUR INTERNS

TRUSTED BY 8,880+ ON GOOGLE

From Intern to Tech Lead



"The PCB design and STM32 firmware modules were exactly what I needed."

RAHUL M.

ROS 2 Expert in 12 Weeks



"The Nav2 modules were production-grade. Now architecting multi-robot systems."

ASHA R.

Sim-to-Real Magic



"I went from breaking robots in week 4 to deploying RL agents by week 14.""

PRIYA S.

Web Dev → Robotics



"Came from pure web dev. Now I'm a robotics software engineer at Amazon!"

DEEPAK K.

FreeRTOS Saved My Career



"The FreeRTOS module was a game-changer for real-time systems."

SNEHA A.

From Mech to Robotics AI



"Mechanical engineer here. Now a Robotics AI Engineer at Waymo."

NIKHIL M.

HYBRID TRAINING EXPERIENCE

Seamlessly blend online theoretical depth with offline real-world practicals. Build and program autonomous robots with hands-on exposure to sensors, actuators, live navigation projects, and internship opportunities.



ONLINE + OFFLINE LABS
LIVE SESSIONS PAIRED WITH IN-LAB CODING PRACTICALS.
TERMINAL



WORK ON ROBOTIC ARMS,
SENSORS, ACTUATORS, AND LIVE
AUTONOMY PROJECTS.



INTERNSHIP OPPORTUNITIES
APPLY YOUR SKILLS WITH AI
ENGINEERING TEAMS.

EARN PRESTIGIOUS VERIFIABLE CREDENTIALS

Your certification formally validates your skill set in recruiter searches.



VERIFIABLE CREDENTIALS TOKEN

Unique cryptographic hashes
registered on global validation boards.



PREMIUM LINKEDIN INTEGRATIONS

Add directly to your credentials
panel with pre-filled ID tracking.

PROGRAM INVESTMENT

Live Masterclasses & Q&A
Industry Expert Instructors
Practical Case Studies

- 6 MONTHS
- 240+ LAB HOURS
- Flexible 0% EMI Options

Transform your skills from isolated expertise into full-stack robotics capability. Secure your seat for the next cohort and start the capstone that employers notice..

INR 8474^{+GST}

TOTAL INR 59,999*
(INCLUSIVE OF TAXES)

**READY TO BUILD
PRODUCTION-
READY
ROBOTS?**



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