



ARTIFICIAL INTELLIGENCE AND ROBOTICS (AIR) CURRICULUM

1. Foundations:

Linux for Robotics
Python 3 for Robotics
C++ for Robotics
Advanced Modern C++ for Robotics

2. Basic ROS 2:

ROS 2 Basics (Python)
ROS 2 Basics (C++)

3. Intermediate ROS 2:

ROS 2 Navigation
Behaviour Trees for ROS 2
Distributing ROS Apps with Snaps
Intermediate ROS 2
Advanced ROS 2 Navigation
ROS 2 Security
URDF for Robot Modelling in ROS 2
ROS 2 Control Framework
TF ROS 2

4. Robotics Theory:

Robot Control
Robot Dynamics and Control
Kinematics of Mobile Robots
Kalman Filters
Maths for Robotics
Path Planning
Arm Kinematics

5. Navigation:

ROS Navigation
Fuse Sensor Data to Improve Localisation
TEB Local Planner
OpenCV for Robotics
Robot Perception

6. Manipulation

Basics
Intermediate

7. Debugging:

Unit Testing
RViz Advanced Markers
Debug Cases
GTest Framework

8. Web Development for Robotics:

Developing Web Interfaces

9. Simulators:

MuJoCo
Gazebo

10. Artificial Intelligence:

ROS Autonomous Vehicles
NVIDIA Jetson Nano with ROS
OpenAI with ROS
Deep Learning with Domain Randomisation
Reinforcement Learning for Robotics