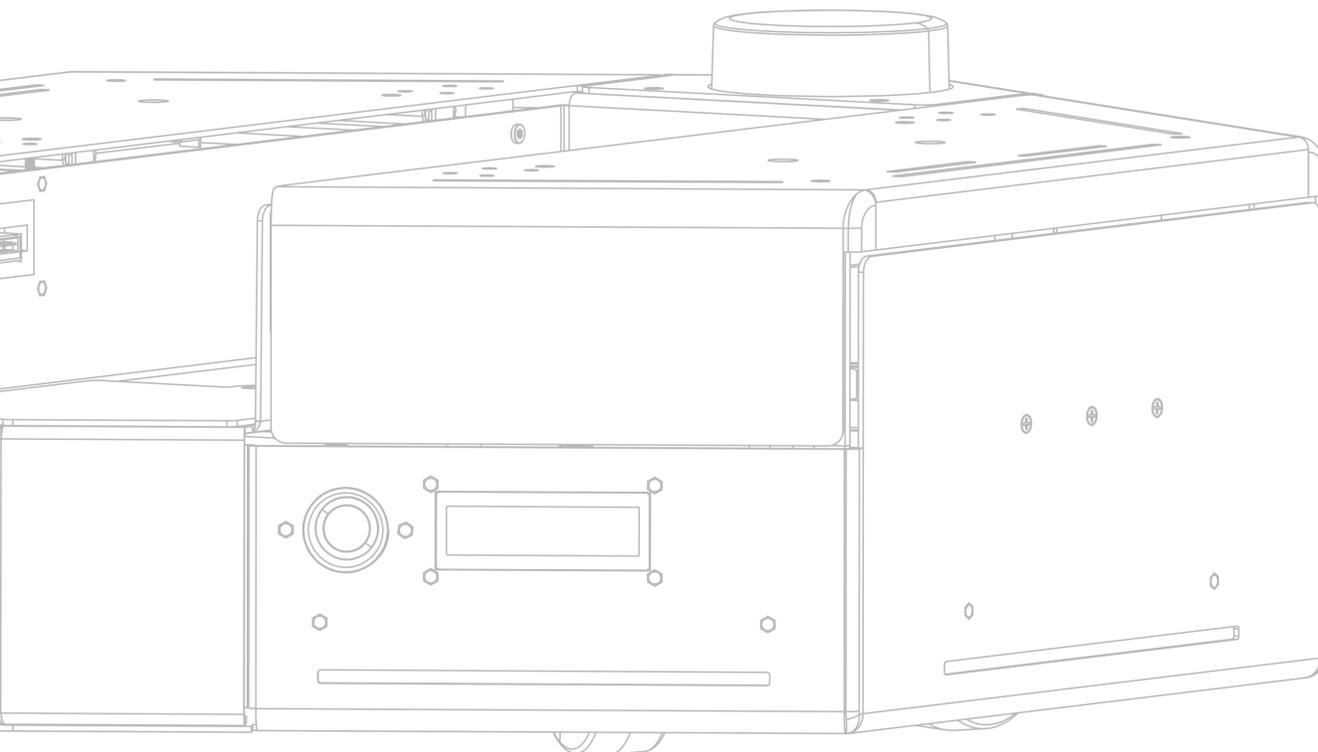# QBOT PLATFORM
ACADEMIC RESOURCE GUIDE

QBOT PLATFORM

ACADEMIC RESOURCE GUIDE

The academic design philosophy behind the QBot Platform is focused on providing meaningful lab experiences for educators while simultaneously arming innovators with tools to meet their research goals. The academic resources provided with the QBot Platform are tailored for cascading learning outcomes within the scope of practical applications for introductory mobile robotics courses. Additionally, example code helps innovators get started with technologies they can build upon within their research context. This results in a mobile robot equipped with industrially and academically relevant sensing and drivetrain technologies, making it ideal for varying levels of undergraduate and graduate applications. This guide provides a summary of potential research applications, learning outcomes & lab content.

	Research Applications	Learning Outcomes
Released	1. Self-Localization & State Estimation *	1. Sensors & Actuators Interfacing 2. Forward/Inverse Differential Kinematics 3. Image/Lidar Acquisition, Calibration & Processing 4. Obstacle Detection
Coming Soon	1. SLAM * 2. Applied AI and Machine Learning 3. Path Planning & Navigation *	1. Self-Localization & State Estimation * 2. Path Planning & Navigation *
Potential	1. Platooning 2. Multi-agent Swarming 3. Behavior Architectures & Decision Making	1. Task Queue Generation & Execution * 2. Multi-agent Task Distribution & Collaboration *

SKILLS PROGRESSION	Pre-lab	Virtual	Hardware	Post-lab	Total Hours
Play (Released)	1	1	1	1	4
Task Automation (Released)	4	5	5	2	16
Surveying*(Coming soon)	5	8	8	3	24

* Reconfigurable mats required