Introduction to the Lecture

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2025.SS

MCI

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Introduction

- The goal of this lecture is to introduce you the field of mobile robotics, from its mechanical construction, to planning, to controlling, and simulating.
- We will start with mechanical concept, then mathematical ideas and continue on with Linux and ROS programming.
- This lecture is a total of 4 SWS with a total of sixty (60) UE.
- A unit (UE) is defined as 45 min lecture.

Introduction

- Lecture materials and all possible supplements will be present in its Github Repo.
  - You can easily access the link to the web-page from here.

> Github is chosen for easy access to material management and CI/CD capabilities and allowing hosting websites.

- In the lecture content is also distributed as a WebBook which can be accessed from the Repo website.

Introduction

- The student should be comfortable with working with either python and/or C++ and be familiar with programming concepts.
- After completion, the student will have a good knowledge on Linux, ROS and the physical aspects of mobile robotics.

Requirements	Taught Lecture	Code	Degree	Outcome
C/C++ Programming	Programming II	PRO2	B.Sc	ROS 2 Programming
Python Programming	Software Design	SWD	B.Sc	Linux Experience
-	-	IOT	B.Sc	Programming
-	-	-	-	-
-	-	-	-	-

Table 1: Distribution of materials across the semester.

Introduction

Description	Value
Official Name	Mobile Robotics
Lecture Code	MRV
Module Code	MECH-B-4-MRV-MRO-ILV
Lecture Name	Mobile Robotics
Semester	4
Season	SS
Lecturer	Daniel T. McGuiness, Ph.D
Module Responsible	BnM
Software	Python, ROS2, Linux
SWS Total	4
UE Total	60
ECTS	5

Table 2: Information regarding the lecture.

Introduction

- The lecture will have two personal assignments. The former assignment will comprise of mathematical and the physical nature of mobile robotics and the latter will focus on the software aspect of mobile robotics.

Assignment Type	Value
Personal Assignment A	50
Personal Assignment B	50
Sum	100

Title
A very informal journey through ROS 2
A Concise Introduction to Robot Programming with ROS2
Programming Principles and Practice using C++

Table 3: Lecture sources which can be useful during the course of the lecture. For more information on sources, please consult the repo.

Topic	Units	Self Study
Locomotion	4	8
Mobile Robot Kinematics	4	8
Perception - I	4	8
Perception - II	4	8
Perception - III	4	8
Localisation - I	4	8
Localisation - II	4	8
Localisation - III	4	8
Path Planning - I	4	8

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Topic	Units	Self Study
Path Planning - II	4	8
Welcome to Linux	4	8
Files and Permissions	4	8
ROS 2 Fundamentals	4	8
ROS 2 CLI Libraries	4	8
ROS 2 Simulation	4	8
SUM	60	120