Introduction to the Lecture

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Version: γ.2025.SS

MCI

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- The goal of this lecture is to introduce to you mobile robotics, from its mechanical construction, to planning and to controlling
- This lecture will start with mathematical ideas and will continue with Linux and ROS programming. The structure for this lecture is as follows.
- 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 some exercises are solved using programming and can be accessed from the Repo website.

Introduction

- The student should be comfortable with working with either python and/or C++.
- For a refreshment on its content the students are encouraged to read the materials presented in the following repos:
- B.Sc Python for Engineering and Economics

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
Degree	B.Sc
Lecture Name	Drive Systems
Semester	4
Season	SS
Assignments	Personal Assignment A Personal Assignment B
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 for you to work with as individuals.

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

Table 3: Distribution of materials across the semester.

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

Table 4: 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
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

Table 5: Distribution of materials across the semester.