

# Syllabus Course description

Course title	Mobile Robotics
Course code	47551
Scientific sector	ING-INF/04
Degree	Master in Industrial Mechanical Engineering
Semester	II
Year	I
Academic Year	2020-2021
Credits	6
Modular	No

Total lecturing hours	16 hrs
Total exercise hours	48 hrs
Attendance	Attendance at lectures and exercise sessions is strongly recommended.
Prerequisites	none
Course page	https://www.unibz.it/en/faculties/sciencetechnology/mas ter-industrial-mechanical-engineering/course- offering/?academicYear=2020

Lecturer	Prof. Karl von Ellenrieder
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Laboratory Instructor	Prof. Helen Henninger Facoltà di Scienze e Tecnologie Building L, Room 6.02 Tel.: +39 E-mail: HelenClare.Henninger@unibz.it Web: https://www.unibz.it/en/faculties/sciencetechnology/academic-staff/person/39403-helen-clare-henninger			
Scientific sector of the	ING-INF/04 - Automatica			
lecturer/lab instructor				
Teaching language	English			
Office hours	As listed on Cockpit or by appointment			
Teaching assistant (if any)	NN			
Office hours	As listed on Cockpit or by appointment			
List of topics covered	<ol> <li>The course covers the following topics:         <ol> <li>Functional architecture of unmanned systems.</li> <li>Vehicle dynamics and modeling.</li></ol></li></ol>			
Teaching format	Classroom lectures and laboratory exercises			

Learning outcomes (ILOs)	Knowledge and understanding				
	1. Applying basic principles to a broad range of dynamic system models (such as those typically learned in the 1 <sup>st</sup> cycle).				
	<ol> <li>Defining sensing and controller requirements for unmanned vehicles that operate in different conditions.</li> <li>Understanding factors that affect system performance and stability.</li> <li>Use of state space techniques for designing controllers and observers.</li> </ol>				



## Applying knowledge and understanding

5. Analyzing, developing and presenting control & navigation systems for applications that span multiple disciplines through laboratory exercises, which complement the lectures.

### Making judgements

6. On the choice of analytical and numerical tools to use in the lab exercises. This may require you to integrate knowledge, handle complexity, and formulate judgements with incomplete data.

#### Communication skills

7. Laboratory reports will require you justify your solutions/conclusions concisely (in clear and simple language).

## Learning Skills

8. Students will be required to develop a proficiency in Matlab and Simulink with a few in-class examples, but mostly on their own. This is intended to help students develop the ability to study in a manner that is largely self-directed or autonomous.

Assessment	Formative assessment					
	Form	Length /duration			ILOs assessed	
	Exercises	18 hours total		1	1-8	
	Summative assessment					
	Form	%	Length /duration		ILOs assessed	1
	Exercises	40			1-8	
	Final Exam	60	4 hours		1-6	
Assessment language	English					
Evaluation criteria and criteria for awarding marks	Laboratory Exercises: Completeness and correctness of answers; level of understanding					of
	Written Final answers.	Exam:	Completeness	and co	orrectness	of



	Students are required to receive an overall grade of greater than 60/100 points in order to pass the course.
Required readings	Lecture notes and exercises will be available on the UniBZ Open Learning Environment (OLE)
Supplementary readings	Additional books and articles may be recommended by the instructor during the course.