

[MRC103] MOBILE ROBOTICS

GENERAL INFORMATION

Studies	Master's Degree in ROBOTICS AND CONTROL SYSTEMS	Subject	?
Semester	2	Course	1
Character	OPTIONAL	Mention / Field of specialisation	AUTONOMOUS SYSTEMS - EIT
Plan	2023	Modality	Face-to-face
Credits	3	Hours/week	0
		Language	CASTELLANO/EUSKARA
		Total hours	28 class hours + 47 non-class hours = 75 total hours

PROFESSORS

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ABU-DAKKA ABU-DAKKA, FARES

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
ROBOT PROGRAMMING	(No previous knowledge required)
ROBOTICS: MECHANICS, MODELLING AND SIMULATION	

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
M1R212 - [!] <i>Resolver tareas de planificación de trayectorias para navegación autónoma de un robot móvil</i>			x	2,2
M1R223 - [!] <i>Capacidad de trabajar en equipos multidisciplinares y en un entorno multilingüe y de comunicar, tanto de forma oral como escrita, conocimientos, procedimientos, resultados e ideas relacionadas con los temas afines al máster</i>		x		0,2
M1R224 - [!] <i>Capacidad para ejercer su profesión con actitud cooperativa y participativa, y con responsabilidad social</i>		x		0,2
M1R227 - [!] <i>Demostrar capacidad para integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre los ODS, los derechos humanos y derechos fundamentales, y sobre la</i>		x		0,4
Total:				3

KC: Knowledge or Content / SK: Skills / AB: Abilities

SECONDARY LEARNING RESULTS

RA131 [!] <i>Identifica y aplica algoritmos de planificación de trayectorias trabajando individualmente y en equipos multidisciplinares</i>			
LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	20 h.	15 h.	35 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Individual written and/or oral tests or individual coding/programming tests	100%	Individual written and/or oral tests or individual coding/programming tests	
Comments: All activities (control points, individual and group work, etc.) must have a minimum grade of 5 and an opportunity for recovery (except the PBL). In unapproved training activities (less than 5) the recovery is compulsory and the final grade will be the grade obtained in the recovery. In the activities carried out it is necessary to obtain a minimum mark of 4 to calculate the average mark of the learning result. Otherwise, the note of the learning result will be that of the suspended activity. The system will calculate the final grade with the RA, applying the percentages defined in IKOF.			
CH - Class hours: 20 h.			
NCH - Non-class hours: 15 h.			
TH - Total hours: 35 h.			

RA132 [!] <i>Desarrolla un control de trayectorias para navegación autónoma de un robot móvil sintetizando los factores que intervienen para realizar juicios éticos y cooperando para obtener la propuesta de manera participativa</i>

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	8 h.	32 h.	40 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	100%	(No mechanisms)	
<p>Comments: All activities (control points, individual and group work, etc.) must have a minimum grade of 5 and an opportunity for recovery (except the PBL). In unapproved training activities (less than 5) the recovery is compulsory and the final grade will be the grade obtained in the recovery. In the activities carried out it is necessary to obtain a minimum mark of 4 to calculate the average mark of the learning result. Otherwise, the note of the learning result will be that of the suspended activity. The system will calculate the final grade with the RA, applying the percentages defined in IKOF.</p>			
<p>CH - Class hours: 8 h. NCH - Non-class hours: 32 h. TH - Total hours: 40 h.</p>			

CONTENTS

- * ROS introduction
- * Simulation environment
- * Sensor integration
- * Autonomous navigation
- * Robot route planning

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	Roland Siegwart, Illah Reza Nourbakhsh and Davide Scaramuzza, "Introduction to Autonomous Mobile Robots", Intelligent Robotics and Autonomous Agents series Howie Choset, Kevin M. Lynch, Seth Hutchinson, George A. Kantor, Wolfram Burgard, Lydia E. Kavraki and Sebastian Thrun, "Principles of Robot Motion: Theory, Algorithms, and Implementations", Intelligent Robotics and Autonomous Agents series