RESEARCH AND INNOVATION IN THE TEACHING AND LEARNING OF NATURAL AND SOCIAL SCIENCES (MASTED-01-03)				
DEGREE PROGRAM:		Master in integrated STEAM Education (MASTED)		
SEMESTER: First	**TYPE:** Basic	**CREDITS:** 8 ECTS	**WORKLOAD:** 200 hours	**MENTORING:** 5 hours/week
LANGUAGE: English				

OBJECTIVES	
General	To develop integrated and inclusive STEAM projects for bilingual primary schools
Specific	• To develop and to present scientific research projects on Natural Sciences and Social Sciences. • To understand methodologies, experimental designs and different procedures for analyzing data obtained in research developed on issues of the Natural Sciences and Social Sciences, as well as their application in Primary Education. • To design teaching units on Natural Sciences and Social Sciences for students of Primary Education, using inquiry teaching and engineering design methodologies. • To develop integrated STEAM projects, including coding and digital resources.
SUBJECT MATTER	
This is a very practical subject in which students develop research projects in Natural and Social sciences to experiment by themselves some active, learners' centred methodologies, as inquiry and engineering methodologies; students are encouraged to reflect on the benefits of using these methodologies for student competence development, citizenship education and inclusion. In the second part of the subject, they learn how to apply these methodologies in the classroom as well as develop teaching integrated and inclusive teaching-learning sequences in bilingual contexts. The MASTED students will also have instruction on coding & robotics, that must be incorporated in the final interdisciplinary educational project for bilingual primary schools. This interdisciplinary project is developed jointly among the two areas of this subject and the subject of Promoting reading in English as a foreign language in Primary Education.	
COMPETENCES	
• C2: Developing advanced cognitive and procedural skills associated with knowledge development and creation. • C8: Professional development and self-reflection. • C17: Embracing complexity in sustainability. • C18: Acting for sustainability.	
LEARNING OUTCOMES	
Knowledge	• Knowledge an understanding of the impact of science, technology, engineering and human activity in general on the natural world. • Knowledge of active, centred methodologies • Knowledge that values and principles influence action that can damage, does not harm, restores or regenerates the environment. • Knowledge of the United Nations SDGs and is aware of interconnections and possible tensions between individual goals. • Basic knowledge of coding and robotics.
Skills	• Ability to plan, organise and innovate the teaching – learning process, as well as apply the plan and assess its application. • Ability to pay attention to diversity and equality so as to favour the inclusion of all students. • Recognition of the learners' needs in order to design, develop, deliver and assess curricular projects, educational settings and teaching strategies that favour the learning process.

	• Ability to make use of resources and didactic materials that help profound learning. • Promotion of innovation in the own teaching practice. • Promotion of student's active participation. • Consideration of the students' previous knowledge and abilities as references to plan the teaching practice, and use of strategies that favour profound and meaningful learning through investigation, collaboration and communication. • Integrated use of knowledge from the own specialty and cross-curricular knowledge adequate to the teaching level and stage. • Use of different assessment methods, strategies and instruments. • Consideration and response to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies.
Attitudes/values	• Disposition to change. • Commitment to promoting the full learning potential of all students. • Disposition to promote students' democratic attitudes and practices, as future European citizens. • Respect and consideration towards all students, fostering positive attitudes, perseverance and dedication. • Initiative to acting in line with values and principles for sustainability.
TEACHING METHODS	
During this subject, Project based learning will be used, accompanied by debates, group public presentations and seminars. The teacher may carry out collaborative activities with social agents within the framework of the Service-Learning methodology within his/her subject. The activity will be evaluated according to the criteria established by the teaching staff based on the work and interaction of the students, which will be established before the beginning of the activity	
EVALUATION	
The evaluation of the course will be carried out through the evaluation of the scientific and engineering Projects elaborated during the course and their expositions. The final interdisciplinary project will be evaluated jointly with the subject of Promoting reading in English as a foreign language in Primary Education.	
PRECONDITIONS	
Have approved all the subject of the first year of the Master' degree.	
DEPARTMENT	Specific Didactics
LECTURERS	Ileana M. Greca Almudena Centeno Alonso Bogdan Radu Toma
LITERATURE	• Greca IM, García Terceño EM, Fridberg M, Cronquist B, Redfors A. (2020) Robotics and Early-years STEM Education: The botSTEM Framework and Activities. European Journal of STEM Education. 2020;5(1), 01. https://doi.org/10.20897/ejsteme/7948 • Greca I. M., Ortiz-Revilla J. y Arriassecq I. (2021) Diseño y evaluación de una secuencia de enseñanza-aprendizaje STEAM para Educación Primaria. Revista Eureka sobre Enseñanza y Divulgación de las Ciencias18(1), 1802. 10.25267/Rev_Eureka_ensen_divulg_cienc.2021.v18.i1.1802 • Mata-Torres S.; Sanz de la Cal E., Greca I. M. (2022). Saturdays of Science. An Experimental Learning and Training Scenario in CLIL and IBSE: A Case Study Frontiers in Education, vol.6 10.3389/feduc.2021.735158 • Ortega Sanchez, D.; Greca, I. M.; Alonso-Abad, MP (2022). Science in Art.– The Cathedral of Burgos as a STEAM element for citizenship education Publisher: Octaedro-CSIC • PAGÈS, Joan; SANTISTEBAN, Antoni, (2011) "La investigación sobre la enseñanza y el aprendizaje de las Ciencias Sociales en la Educación

	Primaria", Didáctica del Conocimiento del Medio Social y Cultural en la Educación Primaria