ENGINEERING AND TECHNOLOGY IN STEAM EDUCATION (MASTED-01-01)

DEGREE PROGRAM:	Master in integrated STEAM Education (MASTED)			
SEMESTER: First	**TYPE:** Basic	**CREDITS:** 3 ECTS	**WORKLOAD:** 75 hours	**MENTORING:** 2 hours/week
LANGUAGE: English				

OBJECTIVES	
General	To understand how engineering and technology concepts can be used in educational contexts.
Specific	- To gain knowledge related to engineering design methodologies. - To gain basic knowledge of programming and coding by blocks. - To create and modify interactive digital learning activities.

SUBJECT MATTER
During this subject, students will practice and critical reflect of the use of engineering concepts and coding and programming for improving students 'comprehension since early years.

COMPETENCES
- C14: Developing advanced digital competences.   - C15: Developing digital pedagogy competences to use, plan and implement new technologies.   - C16: Developing of professional commitment using digital technologies.

LEARNING OUTCOMES	
Knowledge	- Engineering design methodology. - Coding by blocks. - Engineering and programming applied to STEAM education.
Skills	- Ability to use digital technologies to foster learners' active and creative engagement with a subject matter. - Critical thinking. - Problem solving. - Design and making skills. - Programming and coding skills. - Ability to collaborate.
Attitudes/values	- Team-working. - Positive Self-esteem. - Disposition to create and modify complex and interactive digital learning activities.

TEACHING METHODS
Lectures and several hands-on practices will be developed in this course, to help students gaining insights in engineering & technology.

EVALUATION
Peer feedback on group work, and an individual written assignment

PRECONDITIONS
None

DEPARTMENT	Didactics of Experimental Sciences & Electro-mechanical Engineering
LECTURERS	Ileana M. Greca Natalia Muñoz Rujas
LITERATURE	Chu, H.-E., Martin, S. N., & Park, J. (2019). A theoretical framework for developing an intercultural STEAM programme for Australian and Korean students to enhance science teaching and learning. International Journal of Science and Mathematics Education, 17(7), 1251–1266. https://doi.org/10.1007/s10763- 018- 9922-y

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- Ortiz-Revilla, J., Adúriz-Bravo, A., & Greca, I. M. (2020). A framework for epistemological discussion on integrated STEM education. Science & Education, 29, 857–880. https:// doi. org/ 10. 1007/s11191- 020- 00131-9
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