

INTERNATIONAL SEMINARS ON STEM EDUCATION (MASTED-02-14)				
DEGREE PROGRAM:		Master in integrated STEAM Education (MASTED)		
SEMESTER:	TYPE:	CREDITS:	WORKLOAD:	MENTORING:
Second	Basic	4 ECTS	100 hours	6 hours/week
LANGUAGE: Spanish/English friendly				

OBJECTIVES	
General	Acquiring key knowledge, values and skills for STEAM and sustainability education through the participation in international seminars offered in collaboration with the ICSE teacher academy: https://icse.eu/icse-academy/workshops/
Specific	<ul style="list-style-type: none"> • Knowing about inspiring experiences in STEAM and sustainability education. • Exchange enriching perspectives with professionals in STEAM and sustainability education. • Exploring and discussing different experiences in STEAM and sustainability education.
SUBJECT MATTER	
<p>The international seminars offered in collaboration with the ICSE teacher academy https://icse.eu will allow students to learn about inspiring perspectives and experiences in STEAM and sustainability education, Acquiring key knowledge, values and skills in these areas. The subject's content will revolve around these points:</p> <ul style="list-style-type: none"> • Trends in STEM education: inquiry-based learning, engineering design for interdisciplinary STEM, sustainability and socio-scientific issues in STEM education. • Inclusion and diversity in STEM education: from acknowledging to benefiting from diversity in the classroom: how to address gender, interculturality and differences in achievement and performance in the STEM classrooms. • Technological resources to facilitate and enhance STEM learning. • Assessment in STEM education. 	
COMPETENCES	
<ul style="list-style-type: none"> • C1: Developing knowledge and understanding in STEM education. • C2: Developing advanced cognitive and procedural skills associated with knowledge development and creation. • C3: Developing of plans and organizing and innovating the teaching/learning process, as well as to apply the plan and to assess its application. • C4: Developing and using of a wide range of strategies to organize the classroom/learning space and foster learning. • C5: Developing of assess in order to evidence learning and to improve the learning process and the teaching practices. • C6: Developing the ability to pay attention to diversity and equality so as to favour the inclusion of all students. • C8: Professional development and self-reflection. • C11: Developing multilingual competence. • C12: Developing critical literacy competence. • C13: Developing citizenship competence. • 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. • C17: Embracing complexity in sustainability. • C18: Acting for sustainability. • C19: Developing competences for intercultural communication. 	
LEARNING OUTCOMES	
Knowledge	<ul style="list-style-type: none"> • Specialized knowledge in STEM and its application in education. • Knowledge of different languages to facilitate communication in international settings.

	<ul style="list-style-type: none"> • Knowledge and critical understanding of literature and research in STEM education. • Knowledge and understanding of citizenship issues related to education and technology. • Knowledge and understanding complex challenges associated with sustainability in the STEM context.
Skills	<ul style="list-style-type: none"> • Advanced skills in applying STEM concepts and procedures. • Effective planning and organizational skills for innovative teaching and learning. • Skills to create an effective and student-centred learning environment. • Competence in formative and summative assessment. • Advanced skills in using digital technologies in STEM education. • Skills in designing and implementing effective digital pedagogical strategies. • Skills to engage effectively in online professional communities and use digital technologies for professional development. • Skills to integrate cultural and natural aspects into STEM teaching. • Skills for effective communication in intercultural settings.
Attitudes/values	<ul style="list-style-type: none"> • Inclusive attitude and attention to diversity in the classroom. • Attitude toward continuous professional development and reflection on teaching practices. • Proactive attitude towards sustainability and integrating sustainable concepts into STEM teaching.
TEACHING METHODS	
The international seminars will be held through interactive talks offering opportunities for discussing different views and experiences and analyzing cases and concrete examples.	
EVALUATION	
Students will be evaluated on the basis of their attendance and participation in the international seminars.	
PRECONDITIONS	
None	
DEPARTMENT	Didactics of Sciences (UJA) and ICSE
LECTURERS	Pending assignment
LITERATURE	<ul style="list-style-type: none"> • Ariza, M.R., Quesada, A., Abril, A. M., & Cobo-Huesa, C. (2021). Changing teachers' self-efficacy, beliefs and practices through STEAM teacher professional development. <i>Journal for the Study of Education and Development</i>, 44(4), 1-33. https://doi.org/10.1080/02103702.2021.1926164 • Hadjichambis, A. C., Reis, P., Paraskeva-Hadjichambi, D., Činčera, J., Boevde Pauw, J., Gericke, N., & Knippels, M. C. (2020). Conceptualizing environmental citizenship for 21st century education. Springer Nature. • Khine, M., & Areepattamannil, S. (2019). <i>Steam education</i>. Springer International Publishing, ISBN 9783030040024. • National Academies of Sciences, Engineering, and Medicine 2020. <i>Teaching K-12 Science and Engineering During a Crisis</i>. Washington, DC: The National Academies Press. https://doi.org/10.17226/25909 • National Academy of Sciences (2014). <i>STEM integration in K-12 education: Status, prospects, and an agenda for research</i>. Washington, DC: National Academies Press. • Sengupta, P., Shanahan, M. C., & Kim, B. (Eds.). (2019). <i>Critical, transdisciplinary and embodied approaches in STEM education</i>. Springer. • Thibaut, L., Ceuppens, S., De Loof, H., De Meester, J., Goovaerts, L., Struyf, A., ... Depaep, F. (2018). Integrated STEM education: A systematic review of instructional practices in secondary education. <i>European Journal of STEM Education</i>, 3(1), 02. https://doi.org/10.20897/ejsteme/85525