Universitat de Lleida

DEGREE CURRICULUM
RESOLUTION OF STEM CHALLENGES

Coordination: IBAÑEZ PLANA, MANUEL

Academic year 2021-22

Subject's general information

Subject name	RESOLUTION OF STEM CHALLENGES			
Code	100994			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Primary Training	4	OPTIONAL	Attendance-based
Course number of credits (ECTS)	6			

Type of activity, credits, and groups	Activity type	PRAULA	TEORIA
	Number of credits	1.8	4.2
	Number of groups	1	1

Coordination	IBAÑEZ PLANA, MANUEL
Department	ENVIRONMENT AND SOIL SCIENCES
Important information on data processing	Consult this link for more information.
Language	Catalan 80% Spanish10% English 10%

RESOLUTION OF STEM CHALLENGES 2021-22

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
EZQUERRA GARCIA, CARLES ALBERT	carles.ezquerra@udl.cat	2	
IBAÑEZ PLANA, MANUEL	manel.ibanez@udl.cat	2	
MARIN JUARROS, VICTORIA IRENE	victoria.marin@udl.cat	2	

Subject's extra information

- Design, planning of STEM proposals
- Implementation of STEM proposals
- Analysis and evaluation of STEM proposals
- Participation and external communication of STEM proposals

Learning objectives

1. Identify and locate resources to respond to social challenges through STEM.

2. Integrate and apply STEM knowledge to create innovative solutions to social challenges.

3. Design and develop STEM challenges as didactic proposals for primary education.

4. Evaluate the quality of STEM projects, both your own and those of others.

5. Present your own STEM projects to a variety of audiences.

Competences

BASIC SKILLS

CB02: Apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

CB03: Gather and interpret relevant data (usually within their study area) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.

CB04: transmitting information, ideas, problems and solutions to both specialized and non-specialized audiences)

GENERAL COMPETENCES

CG01. To promote democratic values, with special emphasis on tolerance, solidarity, justice and non-violence, and to know and value human rights.

CG02. Know the intercultural reality and develop attitudes of respect, tolerance and solidarity towards different social and cultural groups.

CG03. Know the right to equal treatment and opportunities between women and men, in particular by eliminating discrimination against women, whatever their circumstance or condition, in any of the areas of life.

CG04. Know the measures that guarantee and make effective the right to equal opportunities for people with disabilities.

CG05. Develop the ability to critically analyze and reflect on the need to eliminate all forms of discrimination, direct or indirect, in particular racial discrimination, discrimination against women, that derived from sexual orientation or that caused by a disability.

CG06. Assume the commitment of personal and professional development with oneself and the community. Adapt the learning proposals to the most significant cultural evolutions.

SPECIFIC COMPETENCES

CE01: Know the curricular areas of Primary Education, the interdisciplinary relationship between them, the evaluation criteria and the body of didactic knowledge around the respective teaching and learning procedures.

CE02: Design, plan and evaluate teaching and learning processes, both individually and in collaboration with other teachers and professionals at the center.

CE04: Encourage reading and critical comment on texts from the various scientific and cultural domains contained in the school curriculum.

CE09: Assume that the exercise of the teaching function has to be perfected and adapted to scientific, pedagogical and social changes throughout life.

CE14: Reflect on classroom practices to innovate and improve teaching work.

CE15: Acquire habits and skills for autonomous and cooperative learning and promote it among students.

CE16: Selectively discern audiovisual information that contributes to learning, civic training and cultural wealth.

CE.17. Understand the role, possibilities and limits of education in today's society and the fundamental competencies that affect primary schools and their professionals.

TRANSVERAL COMPETENCES

CT03: Acquire training in the use of new technologies and information and communication technologies.

CT04: Acquire basic knowledge of entrepreneurship and professional environments.

CT05: Acquire essential notions of scientific thought.

Subject contents

1. Definition and analysis of problems and STEM challenges.

Identification of social challenges. Obtaining data and resources. Relation with prior STEM concepts.

2. Design of educational proposal and STEM challenge STEM educational scenarios.

Design of STEM challenges.

3. Development of educational proposal and STEM challenge Creation of STEM educational products.

Possibilities of implementation of STEM proposals.

4. Presentation and evaluation of educational proposal and STEM challenge

Quality criteria for STEM educational projects. Self-evaluation, co-evaluation, hetero-evaluation. Presentation of STEM educational projects.

Methodology

- Case-based learning Individual works
- Tutorships
- Field work
- Project / problem-based learning
- Readings / bibliographic consultation
- Personal study
- Exhibitions and / or work debates / didactic proposals
- Monitoring of individual / group work
- Written tests / performance of work

Development plan

Contents	Timing
1. Definition and analysis of problems and STEM challenges	Weeks 1 and 2
2. Design of educational proposal and STEM challenge STEM educational scenarios.	Weeks 2 and 3
3. Development of educational proposal and STEM challenge Creation of STEM educational products.	Weeks 3 and 4
4. Presentation and evaluation of educational proposal and STEM challenge	Week 5

Evaluation

Project 1. STEM pedagogical proposal: 30%
Project 2. STEM Challenge: 60%

STEM portfolio: 10%

Bibliography

Liston, M. (2018). Designing Meaningful STEM Lessons. Science, 53(4), 34-37.
https://pdst.ie/sites/default/files/Designing%20meaningful%20STEM%20lessons%20Dr.%20Maeve%20Liston.pdf
López Simó, V., Couso Lagarón, D., & Simarro Rodríguez, C. (2020). Educación STEM en y para el mundo digital: El papel de las herramientas digitales en el desempeño de prácticas científicas, ingenieriles y matemáticas. Revista de Educación a Distancia (RED), 20(62). https://doi.org/10.6018/red.410011
Kelley, T. R. & Knowles, J. G. (2016). A conceptual framework for integrated STEM education. International Journal of STEM Education, 3(1), 1–11. https://doi.org/10.1186/s40594-016-0046-z

Official documentos
Generalitat de Catalunya (2017). Pla STEMcat d'impuls de les vocacions científiques, tecnològiques, en enginyeria i en matemàtiques. https://projectes.xtec.cat/steamcat/wp-content/uploads/usu1760/2019/09/pla-stem.pdf
Generalitat de Catalunya (2017). Currículum educació primària (competències bàsiques).
https://agora.xtec.cat/ceiparturmartorell/wp-content/uploads/usu99/2016/04/curriculum-educacio-primaria.pdf

Webs

http://www.scientix.eu/
https://www.siemensstemday.com/
https://educacion.stem.siemens-stiftung.org/r