



Summer School Learning Plan

“Empowering girls to unveil their digital, entrepreneurial and STEM potential”

Outstanding female role models in STEM will empower 60 female students from the province of Jaén (Spain) to show, enjoy and make the most of their STEM, digital and entrepreneurial potential. These girls will live a real research experience guided by excellent mentors, leaders of cutting-edge research projects related to socially relevant STEM topics at the University of Jaén. The girls will make the research project their own and will learn about STEM in a totally applied and useful way while discovering the personal and professional career paths of their mentors. The female role model will be also represented by lecturers and speakers organizing workshops focusing on digital skills to solve scientific problems. On the other hand, this Summer Camp has the purpose of sowing entrepreneurial thinking in girls, thus they will be challenged to design an entrepreneurial proposal that they will outline with the help of successful entrepreneur women. The girls will show off their presentation and communication skills at the open-door Final GEM Conference, where they will enjoy a thought-provoking talk by a renowned researcher in STEM. They will present the experience lived during the week as well as a poster about their idea of entrepreneurship making it clear that they can be the leaders of the future and, why not?, also of the present.

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Coordination: Prof. Dr. Katja Maaß, UNIVERSITY OF EDUCATION FREIBURG, Germany. Partners: UNIVERSITEIT UTRECHT, Netherlands; UNIVERSITA TA MALTA, Malta; UNIVERZITA KONSTANTINA FILOZOFA V NITRE, Slovakia; UNIVERSIDAD DE JAEN, Spain; ETHNIKO KAI KAPODISTRIAKO PANEPISTIMIO ATHINON, Greece; UNIVERZITA KARLOVA, Czech Republic; SCHOOL OF EDUCATION AND COMMUNICATION, Jonkoping; EDEX – EDUCATIONAL EXCELLENCE CORPORATION LIMITED, Cyprus; VILNIAUS UNIVERSITETAS, Lithuania.



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UJA-SPAIN GEM Summer School

Target Group:

Female students aged from 14 to 18 years old (Secondary Education and High School). There will be some places (~10%) reserved for female students from disadvantaged backgrounds.



Venue:

- Facilities of the University of Jaén placed in the Campus de Las Lagunillas S/N, 23071 Jaén (Spain):
 - Lecturing rooms
 - Meeting rooms
 - Computer rooms
 - Laboratories
 - Gardens
 - Outdoor spaces

Transportation to the venue / digital access to the Summer School:

The transfer to/from the venues of the Campus Las Lagunillas will be managed individually by each participant who could use public transport and familiar vehicles.

Subsistence:

Girls will receive a lunch pack every day, funded by the project.

Contact person for girls and their guardians:

Marta Romero Ariza mromero@ujaen.es and María Martín Peciña mmpecina@ujaen.es





Schedule

	11/07/2022	12/07/2022	13/07/2022	14/07/2022	15/07/2022
9:30-10:30	GEM Summer Camp Opening Ceremony	The GEM scientific gymkhana	Entrepreneurship forum	Scientific Illustration workshop	Final GEM Congress
10:30-11:30	Immersion in real research with mentors	“Bioinformatic for Evolution” Workshop	Virtual visit to the National Museum of Natural Science (Madrid)	Immersion in real research with mentors	
11:30-12:00	Lunch	Lunch	Lunch	Lunch	
12:00-13:00	Immersion in real research with mentors	Immersion in real research with mentors	Immersion in real research with mentors	Preparing for the GEM congress	
13:00-14:00	“Let your mind fly and make it come true” (Entrepreneurship workshop)	Immersion in real research with mentors	Immersion in real research with mentors	Preparing for the GEM congress	





Learning Activities

Learning Activities	STEM/ICT subject knowledge	Knowledge of inspiring role models and their meaning	Knowledge about the STEM/digital world of work	Entrepreneurial mind-sets	Transversal skills
Immersion in real research with mentors	X	X	X	X	X
Entrepreneurship workshop		X		X	X
The GEM Gymkhana	X				X
“Bioinformatic for Evolution” Workshop	X	X	X		X
Scientific Illustration workshop		X		X	X
Visit to the National Museum of Natural Science	X		X		
Entrepreneurship forum		X	X	X	X
Inspiring talk at Final GEM Conference	X	X	X		
Girls’ presentation at the Final GEM conference	X			X	X
Free time for building up the GEM community		X			X

Insert description here

During the immersion experience in real research, girls will be exposed to role models (mentors) working and leading projects on different STEM fields. The female role models will also share their





personal and professional experiences, discussing challenges they have encountered and how they solved it, thus facing gender stereotypes. Working on real research projects related to relevance issues for society, girls will learn about specific STEM contents through a practical and hands-on approach based on the PBL methodology (project-based learning) enhancing the feeling of self-competence and efficacy.

Girls will also have the chance to know about different STEM subjects during the planned workshops about Bioinformatics, Evolutionary Biology and Scientific Illustration, during the visit to the National Museum of Natural Science or learning from each other with the presentations about the research projects girls got involved at the Final GEM Conference. Furthermore, workshops will be focused on the use of digital skills and resources to solve Evolution related issues, such as the building of phylogenetics trees from genomic data through computational methods.

In addition, the GEM Summer Camp will promote girls' transversal skill in all the activities planned, especially in those such as the GEM Scientific Gymkhana, lunches and free time, working with mentors or the girls' presentations about their experience in the Final Conference where girls will learn about teamwork, tolerance, organizational skills, enthusiasm, self-motivation, open-mindedness and communication strategies while building up the GEM community.

One of the most important central themes of the GEM Summer Camp 2022 is the offering of opportunities for the development of entrepreneurial minds in the participating girls. In fact, we propose that girls present an entrepreneurial proposal at the end of the GEM week based on what has been working throughout the Camp or from their own initiatives. With the aim of guiding girls in this process, a workshop on the design of ideas and entrepreneurial strategies has been planned on the first day of the week. Then, each group of girls together with their mentor will work on their entrepreneurial proposals and on Wednesday they will have the opportunity to discuss practical issues and to ask for advice in a forum of successful entrepreneurs women who will advise the girls on how to make their idea come true. Girls will present their entrepreneurial idea at the Final GEM Conference in a poster format that will include a representative figure of the proposal designed with the support of the Scientific Illustration workshop.

Finally, the common thread of all the activities planned for this GEM Summer Camp is the connection between girls and female role models in STEM. These female role models are essential for girls to build their scientific identity and will be represented during the Camp by excellent mentors, leaders of cutting-edge research and groups, inspiring and motivating lectures and speakers, as well as females in leading positions and funders of innovative businesses with strong entrepreneurial skills. Therefore, girls will learn about the world of work and the diverse and multiple professional opportunities that STEM encompasses. All these women along with the girls will be part of the GEM community in which the STEM identity is associated with an inclusive environment and a positive learning experience.

As a whole, we offer a range of communicative, playful, interactive and experiential activities to engage female in the GEM Summer Camp with the aim of allowing them to:

- Become aware of the wide range of fascinating professional activities related to STEM and led by women.
- Take part in a real research project guided by inspiring mentors.
- Realize the empowerment feeling while designing, defending and leading an entrepreneurship idea.
- Acquire digital skills related to the use of technical devices for data collection and data management.





- Develop creativity and decision-making skills related to the participation in a constructive project.
- Develop digital skills related to the use of ICT for the presentation and communication of research results.
- Develop their identity in scientific research and/or STEM professional fields.

In this way, the GEM summer camp in Spain will contribute to the project's objectives and promote:

- Girls with knowledge of inspiring role models and their meaning.
- Girls with knowledge about the STEM/digital world of work.
- Girls with entrepreneurial mind-sets.
- Girls with transversal skills.

Lecturers and mentors

In the GEM scientific campus, 12 female brilliant scientists leading relevant research lines in different fields of knowledge will act as mentors sharing their personal and professional background with the girls and offering them an immersion experience into their current research work. Find below, the mentors and research projects that will be offered during the Spanish GEM Summer Camp 2022:

Mentor	Biopic - Project
Maite Martín Valdivia	Vicerrector of ICT and Professor at the Department of Informatics of the University of Jaén. She began her professional career working in a financial institution as a computer technician and now she is dedicated to research in natural language processing. Research project offered: "Talking with robots: Artificial intelligence to improve communication".
Raquel Hernández Cobo	Professor and researcher at the Department of Experimental Biology (University of Jaén). I started her professional career at the University of Jaén at the hands of great researchers, colleagues and now friends, who passed on their passion for science and knowledge as a tool and engine for solving society's challenges. Research project offered: "Histological study of the cellular response to cerebral ischemia".
Gema Parra Anguita	Professor and researcher at the Department of Animal Biology, Vegetal Biology and Ecology (University of Jaén). She started her professional career in marine aquaculture and now she is dedicated to aquatic ecotoxicology. Research project offered: "What do wetlands hide? Finding out cryptic biodiversity through digital images".
Fátima Aguilera Padilla	Professor at the Department of Didactic of Science (University of Jaén). She began her professional career in the area of Botany at the University of Jaén and





now she is dedicated to teaching and research in Didactics of Experimental Sciences.

Research project offered: "Is pollination at risk? study of the production and viability of pollen grains".

M^a José Grande Burgos

Researcher at Department of Health Science (University of Jaén). She started her professional career in the field of Microbiology and Genetics and now she is dedicated to teaching and research identifying pathogenic microorganisms in food and in the environment.

Research project offered: "Microbiological Zoo".

Pilar Gemma Rodríguez Ortega

Professor and researcher at the Faculty of Educational Sciences of the University of Córdoba. PhD in Chemistry from the University of Jaén (2013). Currently, her research focused on the study of (1) the attitudinal factors and motivations of secondary school students that affect interest in learning issues related to science and technology; (2) the barriers, benefits and learning results derived from the use of pedagogies based on open educational resources (OER) of the EDIA project (MEC-CEDED-INTEF) and (3) the perception of teachers in initial training on the nature of science and scientific research, and its influence on their views regarding the teaching-learning processes of science.

Research project offered: "Investigating the acidity of olive oil: What it is? What does it mean in terms of product quality? How can we determine it quickly and effectively?".

Eva Vargas Liébanas

Postdoctoral researcher at the Department of Experimental Biology (University of Jaén). She graduated in Biology at the University of Jaén in 2014. Then, she studied a Master's in Biotechnology and Biomedicine, which allowed her to get a PhD in Molecular and Cellular Biology. Her research focuses on the study of the molecular bases of infertility through computational analysis.

Research project offered: "What is essential is invisible to the eye: genes, proteins, microorganisms and their role in human reproduction".

María José del Jesús Díaz

Professor and researcher at the Department of Informatics (University of Jaén). She began her professional career as a teacher at the university where she started her research. She currently coordinates a research group on Artificial Intelligence, in which they develop techniques that are applied to Medicine, Economics, Ecology, Security and Renewable Energies. She enjoys this profession and tries to transmit that passion.

Research project offered: "Artificial intelligence and machine learning for society".

María Dolores Pérez Godoy

Professor and researcher at the Department of Informatics (University of Jaén). Since she began her professional career as a University professor, she has dedicated, on one hand, to teaching in the field of Computer Science and, on the other hand, to research in the area of Artificial Intelligence applied to knowledge extraction.





Research project offered: “Artificial intelligence and machine learning for society”.

Marta Molina
Pérez

Student of the Bachelor in Informatics Engineering. She will support the implementation of the project “Artificial intelligence and machine learning for society” during the GEM Summer Camp 2022 led by María Dolores Pérez Godoy and María José del Jesús Díaz.

María Isabel
Cabrera Bermejo

Student of the Master Degree in Informatics Engineering. She will support the implementation of the project “Artificial intelligence and machine learning for society” during the GEM Summer Camp 2022 led by María Dolores Pérez Godoy and María José del Jesús Díaz.

Rocío Bolaños
Jiménez

Professor and researcher at the Department of Mechanical and Mining Engineering (University of Jaén). She started her professional career working as an engineer in the R+D Department of an international company and now she is dedicated to teaching and research at the University of Jaén. She works in the field of Fluid Mechanics, a very broad and exciting discipline, but with very little female presence.

Research project offered: “Fluid Mechanics: unraveling the mysteries of bubbles, drops and other surface tension phenomena”.

Apart from mentor guiding girls during their immersion experience in research, this Camp will count on several females lectures and experts in different skills that will offer motivating and stimulating workshops to enhance digital and entrepreneurial minds as well as other useful skills for the STEM world of work:

Lecturer	Workshop/Conference
Ximena Villalonga	Designer of scientific jewelry and founder of the Xcience Designs company. She will lead an entrepreneurship workshop focused on supporting students to polish their seed entrepreneurship proposals, thus set up as a forum for discussion and question/answer approaches.
Gema Torres Luque	Professor and researcher in the Department of Didactics of Body Expression and director of the Secretariat of Physical Activity and Sport (University of Jaén). She will organize the GEM Scientific Gymkhana supporting the building of the GEM community between girls who will learn about STEM in a fun and dynamic way.
Carolina Osuna Mascaró	She got a PhD in Fundamental and Systems Biology in the University of Granada for her research about hybridization as an evolutionary driver for speciation. Currently, she is a Postdoc Associate in the University of Nevada (Reno, USA) studying population genetics of different plant species. She





	will offer the workshop “The power of Bioinformatics to study the past of living beings” together with María Martín Peciña.
María Martín Peciña	She got a PhD in Fundamental and Systems Biology in the University of Granada for her research in evolution and adaptation of genomes to the presence of selfish chromosomes. Currently, she is a researcher in Science Education at the University of Jaén. She will offer the workshop “The power of Bioinformatics to study the past of living beings” together with Carolina Osuna Mascaró.
Scientific Illustrator	She will carry out a workshop about the value of the image to transmit scientific ideas and knowledge. This workshop will help students build a logo for their entrepreneurship proposals.
Pilar López García-Gallo	Vice Director of Communication and Scientific Culture of the National Museum of Natural Science (Spanish Research Council). She will offer a virtual visit to the National Museum of Natural Science (Madrid).
AllGenetics & Biology SL	A company made up of a highly-motivated and extremely well-assembled group of young scientists carrying out hundreds of genomics-related projects for leading research institutions and companies from different countries and continents. They will offer a workshop about entrepreneurship highlighting key points to make an idea come true.
Closure conference	A brilliant researcher from a relevant field in STEM and digital sectors will talk about her professional and personal experience in STEM acting as a role-model in science for girls.

Finally, a group of experts in the digital field, entrepreneurship, stem; as well as the gender and education perspective will be of support in the management and configuration of the 2022 Summer Camp.

Name	Position
Patricia Huertas Mesa	She started her professional career as an Early Childhood Education teacher and now she is the Provincial Coordinator of Teacher Training in Jaén. She is convinced that the change in the educational paradigm is linked to the permanent training of our teachers. This must be of quality and we must take advantage of all the resources available to us for the good of children and our society.
Matilde Peinado Rodríguez	Director of the Equality Unit - University of Jaén. Her proposal for the GEM Summer Camp 2022 is to open a window for participating students from which to learn, analyze and apply the management of gender equality and diversity in the university environment in three dimensions: conceptual, methodological and practical. For this she will present the main campaigns that are training and raising awareness in





these areas as well as the management of equality policies and diversity of our institution and its projection in training, research and transfer at the UJA.

Pilar López García-Gallo

Vice Director of Communication and Scientific Culture of the National Museum of Natural Science (Spanish Research Council). She participates in the National Panel of Experts of the GEM Project from her position as an advisor in the management and organization of scientific dissemination programs for all audiences, especially for young people and adolescents.

Dolores Victoria Ruiz Garrido

Architect and entrepreneur. She participates in the National Panel of Experts of the GEM Project from my position as educator, architect and entrepreneur. She started her professional career as an architect with her own studio and now she is dedicated to spreading sustainable architecture and the value of improving urban space for our happiness and that of the planet.

Ximena Villalonga

Entrepreneur and designer of scientific jewelry. She began her professional career as a Biotechnology graduate developing her doctorate in the area of immunopharmacology at the Faculty of Medicine of the University of Buenos Aires and now she is dedicated to combine science and art, in particular, to the designing jewelry and accessories inspired by shapes, structures, colors and other components that make science something beautiful.

María Teresa Martín Valdivia

She participates in the National Panel of Experts of the GEM Project from her position as Vice-Rector of ICT at the University of Jaén. She believes in the importance of making women visible in all areas of science in general, and in STEM areas in particular and she would like to contribute to promoting the participation and involvement of girls in STEM careers.

UJA-SPAIN GEM Summer School Support Site

You can find more information about the Summer School in the national language by following this link:

LINK: <https://gem-esp.eu/>

