

Microcredential course in STEAM education through a hands-on approach

Scope

Proposal to strengthen the training offer of the School of Technology (ESTT) of the Polytechnic of Tomar (IPT), through the microcredential course in STEAM (Science, Technology, Engineering, Arts, and Mathematics) education, where the role of mathematics will be highlighted. In particular, a hands-on, practical approach to the various curricular areas is proposed to promote meaningful learning where inquiry is encouraged during the activities/tasks implemented.

In line with this, we submit this proposal to create the Microcredential Course in STEAM education through a hands-on approach, with 1 ECTS, corresponding to a total of 27 hours (13 contact hours and 14 hours of self-directed study).

Context

This course incorporates the new curriculum recommendations, particularly those relating to primary and secondary education, which advocate a more interdisciplinary approach to teaching. An integrated STEAM approach is therefore becoming increasingly popular, as it prepares students for real-life challenges and professions that require knowledge in these subjects. Recently, this approach has been proposed as a means of motivating students to study mathematics, a subject that is often blamed for contributing to academic failure, which in turn restricts access to professional careers in this field.

In this context, we propose a course with an integrated STEAM approach that emphasises mathematics and uses a hands-on, inquiry-based methodology. Students are asked questions that encourage them to carry out practical activities, think critically, discuss and reach conclusions, thereby promoting meaningful learning of the curricular concepts introduced.

Target Audience

Teachers or professionals who wish to develop and implement an integrated STEAM approach through hands-on practical activities, particularly those related to the primary and secondary school curriculum.

Student Places

The maximum number of places is twenty (20).

Course Structure

The training will cover the following subject content:

1. An introduction to STEAM and teaching methodologies in this context.
2. Hands-on, practical activities that take an interdisciplinary approach to STEAM.
3. Planning and construction of support materials for the implementation of STEAM practices in the classroom.

Methodology

This course is based on a pedagogical model designed for hybrid teaching, i.e. face-to-face with the option of live videoconference streaming. Following an introduction to STEAM and the

importance of an integrated approach, the session will discuss approaches such as inquiry-based learning, which promote meaningful learning for students. The course includes 13 hours of instructor-led sessions, followed by 14 hours of self-directed learning.

Assessment Method

Project applying knowledge to the development of practical STEAM activities (100%).