

## Specialized Didactics of Subject Areas

### COURSE CONTENT:

#### Didactics of Sciences

##### Topics

1. History, Epistemology, and Perspectives on STEM and STEM Education
2. Cultural, Social Issues in Science Teaching
  - Gender roles, equity in knowledge access, remote education, and teaching
3. Literacies in Science Teaching
  - Concepts of scientific literacy, citizenship education, decision-making, debates on socioscientific issues (SSI), social dimensions of science, technoscientific practices, public engagement in science
4. Educational Policies, Curriculum, and Assessment in STEM
  - Policy review, curriculum development, evaluation, and literature review on STEM education
5. Conceptual Change Theories
  - Conceptual models, studies, theories of cognitive change, concept formation, cognitive development
6. Designing Learning Environments Inside and Outside School Settings
  - Theories of collaborative learning
7. New Digital Methods in Science Teaching
  - Modeling, experiments, online learning environments, simulations, virtual laboratories
8. Role of Models and Representations in Physics
  - Use of visual representations, analogies, metaphors, and models
9. Innovative Didactic Approaches in Science Learning and Teaching
  - Design and production of educational materials
10. Educational Policies in Science Teaching
  - European framework, international comparative studies (TIMSS, PISA), institutional reforms, and global issues in science policy
11. Science Teaching at the University Level
  - Role of universities, learning, and teaching at the higher education level
12. Metacognitive Skills
  - Historical development of metacognition, different contexts of metacognitive beliefs, experiences, knowledge, and skills