

63137 - Literacy in natural sciences and mathematics: educational research approaches

Syllabus Information

Academic Year: 2020/21

Subject: 63137 - Literacy in natural sciences and mathematics: educational research approaches

Faculty / School: 107 - Facultad de Educación

Degree: 330 - Complementos de formación Máster/Doctorado
573 - Master's in Lifelong Learning: Introduction to Research

ECTS: 3.0

Year: XX

Semester: 330 - First semester

573 - First semester

Subject Type: 573 - Optional

330 - ENG/Complementos de Formación

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on active participation, bibliographic research, teamwork, etc. that favors the development of communicative skills and critical thinking. A wide range of teaching and learning tasks are implemented, such as lectures, practical activities, autonomous work, tutorials and academic guidance.

Classroom materials will be available via Moodle.

Further information regarding the course will be provided on the first day of class.

4.2.Learning tasks

The course includes 3 ECTS organized according to:

- Lectures (0.4 ECTS): 4 hours.
- Practice sessions (0.5 ECTS): 5 hours. Check the official calendar (1st semester).
- Autonomous work (1.5 ECTS): 15 hours. Design of a research proposal in Science or Mathematics Education. During

the last week of the course, its presentation and discussion will take place.

- Tutorials (0.5 ECTS): 5 hours. Throughout the semester and before the presentation of the final proposal.

- Global assessment (0.1 ECTS): 1 hour. (Deadline for the submission of individual work): check official calendar in http://educacion.unizar.es/inf_academica_Master_aprendizaje.html

4.3.Syllabus

The course will address the following topics:

Topic 1. Broaden the knowledge of didactic research in Science and Mathematics Education.

Topic 2. Examples of methodologies applied in Science and Mathematics Education: case studies, content analysis, investigation-action, history and nature of science, phenomenological and historic analysis. Links of interest, publications, meetings, conferences, etc.

Topic 3. Design elements in didactic research on Science and Mathematics Education.

4.4.Course planning and calendar

Academic calendar:

http://educacion.unizar.es/calendario_Master_aprendizaje.html

Assessment activities:

http://educacion.unizar.es/inf_academica_Master_aprendizaje.html

Classroom materials will be available via Moodle. Students have access using personal ID and Password.

<https://moodle.unizar.es/>

4.5.Bibliography and recommended resources

[BB: Basic Bibliography / BC: Complementary Bibliography]

- [BB] 11 ideas clave : El desarrollo de la competencia científica / Emilio Pedrinaci (coord.) ; Aureli Caamaño, Pedro Cañal, Antonio de Pro. - 1ª ed. Barcelona : Graó, 2012
- [BB] Blanco,L. (2011). La investigación en Educación Matemática. *Educatio Siglo XXI : revista de la Facultad de Educación, Universidad de Murcia*, 29 (1), 109-128 [Publicación periódica] [Acceso a texto completo]
- [BB] Didáctica de las ciencias experimentales : teoría y práctica de la enseñanza de las ciencias / dirección, Francisco Javier Perales Palacios, Pedro Cañal de León Alcoy : Marfil, 2000
- [BB] EBook proceedings of the ESERA 2011 conference : science learning and citizenship / C. Bruguière, A. Tiberghien y P. Clément. (eds). Lyon, France: European Science Education Research Association, 2010 [Acceso a texto completo. Ver URL]
- [BB] EBook proceedings of the ESERA 2013 Conference: Science education Research For Evidence-based Teaching and Coherence in Learning / C.P. Constantinou, N. Papadouris y A. Hadjigeorgiou (eds). Nicosia, Cyprus: European Science Education Research Association, 2014 [Acceso a texto completo. Ver URL]
- [BB] Godino, J.D.. *Perspectiva de la didáctica de las matemáticas como disciplina tecnocientífica.. Universidad de Granada*, 2010. [Acceso a texto completo. Ver URL]
- [BB] *Handbook of research on science education / edited by Norman G. Lederman, Sandra K. Abell.. New York ; Abingdon [UK] Routledge , 2014*
- [BB] *Handbook of research on the psychology of mathematics education / edited by A. Gutierrez, Boero, P.(eds). Rotterdam, Holanda: Sense Publisher, 2006[Comentario del profesor: Acceso a texto completo (ver URL)]*
- [BB] Hazen, R.M. y Trefil, J.. *Science Matters. Achieving Scientific Literacy. New York: Anchor Books, 2009*
- [BB] *International handbook of mathematics education / edited by Alan J. Bishop...[et al.] . Dordrecht : Kluwer Academic Publishers , 1996*
- [BB] Pro, A. (2009). ¿Qué investigamos sobre la Didáctica de las Ciencias Experimentales en nuestro contexto educativo?. *Investigación en la Escuela*,69 45-59 [Publicación periódica] [Acceso a texto completo]
- [BB] Rico, L. (2012). Aproximación a la Investigación en Didáctica de la matemática. *Avances de investigación en Educación Matemática*, 1 39-63 [Publicación periódica] [Acceso a texto completo. Ver URL]
- [BB] Sierra, M. (2011). Investigación en Educación Matemática: objetivos, cambios, criterios, métodos y difusión. *Educatio Siglo XXI*, 29 (2), 173-198 [Publicación periódica] [Acceso a texto completo]

URL List:

- Aproximación a la Investigación en Didáctica de la matemática. *Avances de investigación en Educación Matemática*, 1 39-63 [<https://dialnet.unirioja.es/servlet/articulo?codigo=4051778>]
- EBook proceedings of the ESERA 2011 conference : science learning and citizenship [<http://www.esera.org/media/ebook/ebook-esera2011.pdf>]

- EBook proceedings of the ESERA 2013 Conference: Science education Research For Evidence-based Teaching and Coherence in Learning. [http://www.esera.org/media/documets/ESERA_ebook_2013.pdf]
- Handbook of research on the psychology of mathematics education [<https://www.sensepublishers.com/media/457-handbook-of-research-on-the-psychology-of-mathematics-educationa.p>]
- Perspectiva de la didáctica de las matemáticas como disciplina tecnocientífica [http://www.ugr.es/~jgodino/fundamentos_teoricos/perspectiva_ddm.pdf]