

Course guide

330338 - GRGE - Geological and Energy Resource Management

Last modified: 28/04/2025

Unit in charge: Manresa School of Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: MASTER'S DEGREE IN MINING ENGINEERING (Syllabus 2013). (Compulsory subject).
Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Olivella Pastalle, Sebastian
Others: Rodriguez Dono, Alfonso

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. (ENG) Planificar i gestionar recursos energètics, inclosos generació, transport, distribució i utilització.
2. (ENG) Coneixement adequat de modelització i avaluació de recursos geològics, incloses les aigües subterrànies, minerals i termals.

Transversal:

3. ENTREPRENEURSHIP AND INNOVATION: Being aware of and understanding how companies are organised and the principles that govern their activity, and being able to understand employment regulations and the relationships between planning, industrial and commercial strategies, quality and profit.
4. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Self study	80,0	64.00
Hours medium group	45,0	36.00

Total learning time: 125 h



CONTENTS

title english

Description:

content english

Full-or-part-time: 16h

Practical classes: 6h

Self study : 10h

title english

Description:

content english

Full-or-part-time: 16h

Practical classes: 6h

Self study : 10h

title english

Description:

content english

Full-or-part-time: 10h

Practical classes: 4h

Self study : 6h

title english

Description:

content english

Full-or-part-time: 10h

Practical classes: 4h

Self study : 6h

title english

Description:

content english

Full-or-part-time: 8h

Practical classes: 3h

Self study : 5h

title english

Description:

content english

Full-or-part-time: 10h

Practical classes: 4h

Self study : 6h

title english

Description:

content english

Full-or-part-time: 16h

Practical classes: 6h

Self study : 10h

title english

Description:

content english

Full-or-part-time: 13h

Practical classes: 5h

Self study : 8h

ACTIVITIES

(ENG) 1. SORTIDES I VISITES A CASOS REALS

Full-or-part-time: 2h

Practical classes: 2h

(ENG) 2. RESOLUCIÓ D'EXERCICIS DE CASOS REALS

Full-or-part-time: 1h

Practical classes: 1h

(ENG) 3. REALITZACIÓ D'UN TREBALL EN GRUP

Full-or-part-time: 21h

Practical classes: 2h

Self study: 19h

(ENG) 4. PROVA INDIVIDUAL ESCRITA**Full-or-part-time:** 2h

Practical classes: 2h

GRADING SYSTEM**BIBLIOGRAPHY****Basic:**

- Alan Moreno, Sergio; Espí, José Antonio. Introducción al uso de las herramientas de gestión ambiental aplicadas a los recursos naturales no renovables [on line]. Madrid: Red Desir, 2008 [Consultation: 21/12/2020]. Available on: https://portal.camins.upc.edu/materials_guia/250504/2014/Libro%20Herramientas.%20ALFA-DESIR%20-%20copia.pdf. ISBN 9788496398115.
- Commonwealth of Australia. Mine rehabilitation: leading practice sustainable development program for the mining industry [on line]. Canberra: Dept. of Industry, Tourism and Resources, 2006 [Consultation: 21/12/2020]. Available on: https://nt.gov.au/_data/assets/pdf_file/0016/203416/mine-rehabilitation.pdf. ISBN 0642724814.
- Asociación Nacional de Empresarios de Fabricantes de Áridos. Gestión de residuos en explotaciones mineras a cielo abierto [on line]. Logroño: Gobierno de La Rioja. Consejería de Turismo, Medio Ambiente y Política Territorial. Dirección General de Política Territorial, 2008 [Consultation: 21/12/2020]. Available on: <http://www.larioja.org/territorio/es/minas/jornadas-estudios-publicaciones-tecnicas/gestion-residuos-explotaciones-mineras-cielo-abierto>.
- European Commission. Reference document on best available techniques for management of tailings and waste-rock in mining activities [on line]. Bruxelles: European Commission, 2009 [Consultation: 22/12/2020]. Available on: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/best-available-techniques-bat-reference-document-management-waste-extractive-industries>.
- Olivella, S., i altres. "Nonisothermal multiphase flow of brine and gas through saline media". Transport in porous media [on line]. June 1994, vol. 15, no. 3, p. 271-293 [Consultation: 21/12/2020]. Available on: <https://doi.org/10.1007/BF00613282>.
- Olivella, S., i altres. "Numerical formulation for a simulator (CODE_BRIGHT) for the coupled analysis of saline media". Engineering computations [on line]. 1996, vol. 13, no. 7, p. 87-112 [Consultation: 21/12/2020]. Available on: <http://hdl.handle.net/2117/2210>.
- Bear, Jacob; Bachmat, Yehuda. Introduction to modeling of transport phenomena in porous media [on line]. Dordrecht: Kluwer Academic Publishers, 1991 [Consultation: 17/01/2023]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=6496722>. ISBN 079231106X.
- Bird, R. Byron; Stewart, Warren E.; Lightfoot, Edwin N. Transport phenomena. 2nd ed. New York: Wiley & Sons, 2002. ISBN 0471410772.
- Riera, Pere. Manual de economía ambiental y de los recursos naturales. Madrid: Thomson-Paraninfo, cop. 2005. ISBN 8497323696.
- Bear, Jacob. Dynamics of fluids in porous media [on line]. New York: Dover, 1988 [Consultation: 06/06/2024]. Available on: <https://search-ebshost-com.recursos.biblioteca.upc.edu/login.aspx?direct=true&AuthType=ip,uid&db=nlebk&AN=1152791&site=ehost-live&ebv=EK&ppid=Page--1>. ISBN 0486656756.

Complementary:

- Riba i Romeva, Carles. Recursos energéticos y crisis: el fin de 200 años irrepetibles [on line]. Barcelona: Octaedro, 2012 [Consultation: 17/12/2020]. Available on: <http://hdl.handle.net/2099.3/36468>. ISBN 9788499213705.
- Krüger, Paul. Alternative energy resources: the quest for sustainable energy. New York: Wiley, 2006. ISBN 0471772089.
- Rodríguez Dono, Alfonso. Las energías renovables en el contexto energético actual y futuro [on line]. Vigo: Universidad de Vigo, Escuela Técnica Superior de Ingenieros de Minas de Vigo, 2003 [Consultation: 21/12/2020]. Available on: https://www.researchgate.net/publication/263785338_LAS_ENERGIAS_RENOVABLES_EN_EL_CONTEXTO_ENERGETICO_ACTUAL_Y_FUTURO.
- Bardi, Ugo. Los límites del crecimiento retomados. Madrid: Los Libros de la Catarata, 2014. ISBN 9788483198711.
- Rodríguez Dono, Alfonso; Espí, José Antonio. Análisis de riesgos en proyectos de almacenamiento geológico de CO₂: selección de emplazamientos adecuados, costes y análisis de los riesgos asociados a este tipo de proyectos. Saarbrücken: Editorial Académica Española, 2011. ISBN 9783847355229.
- McDonough, W.; Braungart, M. Cradle to cradle: re-making the way we make things [on line]. London: Vintage, 2009 [Consultation:

- 09/11/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6705. ISBN 9780099535478.
- Binning, Carl, ed. Techniques to value environmental resources: an introductory handbook. Canberra: Australian Government Publishing Service, 1995.
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- Barnes, Frank S.; Levine, Jonah G., eds. Large energy storage systems handbook. Boca Raton: CRC Press, 2011. ISBN 9781420086003.
- Alonso, E. E., i altres. "Modelling the response of Lechago earth and rockfill dam". Géotechnique [on line]. May 2011, vol. 61, no. 5, p. 387-407 [Consultation: 21/12/2020]. Available on: <https://doi.org/10.1680/geot.SIP11.P.013>.
- Blanco, A., i altres. "Thermo-hydraulic behaviour of the vadose zone in sulphide tailings at Iberian Pyrite Belt: Waste characterization, monitoring and modelling". Engineering geology [on line]. October 2013, vol. 165, no. 24, p. 154-170 [Consultation: 21/12/2020]. Available on: <https://doi.org/10.1016/j.enggeo.2013.05.022>.
- Gens, A., i altres. "Analysis of a full scale "in situ" test simulating repository conditions". International journal for numerical and analytical methods in geomechanics [on line]. July 1998, vol. 22, no. 7, p. 515-548 [Consultation: 21/12/2020]. Available on: [https://doi.org/10.1002/\(SICI\)1096-9853\(199807\)22:7%3C515::AID-NAG926%3E3.0.CO;2-8](https://doi.org/10.1002/(SICI)1096-9853(199807)22:7%3C515::AID-NAG926%3E3.0.CO;2-8).
- Gran, M., i altres. "Modeling evaporation processes in a saline soil from saturation to oven dry conditions". Hydrology and earth system sciences [on line]. 2011, vol. 15, no. 7, p. 2077-2089 [Consultation: 21/12/2020]. Available on: <https://doi.org/10.5194/hess-15-2077-2011>.
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- Mokni, N., i altres. "Surface movements in a rock massif induced by drainage associated to tunnel excavation". International journal for numerical and analytical methods in geomechanics [on line]. June 2013, vol. 37, no. 9, p. 1162-1188 [Consultation: 22/06/2017]. Available on: <http://dx.doi.org/10.1002/nag.2082>.
- Vilarrasa, V., i altres. "Long term impacts of cold CO2 injection on the caprock integrity". International journal of greenhouse gas control [on line]. May 2014, vol. 24, p. 1-13 [Consultation: 21/12/2020]. Available on: <https://doi.org/10.1016/j.ijggc.2014.02.016>.