

330417 - DETC - Design and Excavation of Tunnels

Coordinating unit: 330 - EPSEM - Manresa School of Engineering
 Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering
 Academic year: 2019
 Degree: BACHELOR'S DEGREE IN MINING ENGINEERING (Syllabus 2016). (Teaching unit Compulsory)
 ECTS credits: 6 Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Parcerisa Duocastella, David - Yubero De Mateo, Maria Teresa

Degree competences to which the subject contributes

Specific:

1. (ENG) Tècniques de perforació aplicades a obres subterrànies i superficials. Tècniques de mostreig.
2. (ENG) Assaigs geotècnics. Estudis geotècnics aplicats a la mineria, construcció i obra civil. Disseny i execució d'obres subterrànies. Tècniques de sosteniment aplicades a obres subterrànies.

Transversal:

3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

Learning objectives of the subject

Study load

Total learning time: 150h	Hours large group:	0h	0.00%
	Hours medium group:	60h	40.00%
	Hours small group:	0h	0.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

<p>title english</p>	<p>Learning time: 7h Practical classes: 2h Self study : 5h</p>
<p>Description: content english</p>	
<p>title english</p>	<p>Learning time: 32h Practical classes: 4h Laboratory classes: 8h Self study : 20h</p>
<p>Description: content english</p>	
<p>title english</p>	<p>Learning time: 25h Practical classes: 6h Laboratory classes: 4h Self study : 15h</p>
<p>Description: content english</p>	
<p>title english</p>	<p>Learning time: 26h Practical classes: 6h Laboratory classes: 5h Self study : 15h</p>
<p>Description: content english</p>	
<p>title english</p>	<p>Learning time: 36h Practical classes: 12h Laboratory classes: 4h Self study : 20h</p>
<p>Description: content english</p>	

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title english	Learning time: 25h Practical classes: 6h Laboratory classes: 4h Self study : 15h
Description: content english	

Planning of activities

name english	Hours: 16h Laboratory classes: 8h Self study: 8h
name english	Hours: 10h Self study: 4h Laboratory classes: 6h
name english	Hours: 9h Laboratory classes: 4h Self study: 5h
name english	Hours: 5h Laboratory classes: 2h Self study: 3h
name english	Hours: 16h Practical classes: 4h Self study: 12h

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Bibliography

Basic:

- Chapman, D.; Metje, N.; Stärk, A. Introduction to tunnel construction. London: Spon Press, 2010. ISBN 9780415468428.
- Gonzalez de Vallejo, L. I., dir. Manual de campo para la descripción y caracterización de macizos rocosos en afloramientos. Madrid: Instituto Tecnológico Geominero, 2007. ISBN 8478407081.
- Gonzalez Vallejo, Luis I., i altres. Ingeniería geológica [on line]. Madrid: Prentice-Hall, 2002 [Consultation: 21/05/2019]. Available on: <https://discovery.upc.edu/iii/encore/record/C__Rb1510174?lang=cat>. ISBN 8420531049.
- Hoek, Evert. "Big tunnels in bad rock". ASCE Journal of Geotechnical and Geoenvironmental Engineering [on line]. September 2001, vol. 127, no. 9, p. 726-740 [Consultation: 20/06/2017]. Available on: <<https://www.rocscience.com/assets/resources/learning/hoek/Big-Tunnels-in-Bad-Rock-2000.PDF>>.
- Hoek, E.; Brown, E. T. Excavaciones subterráneas en roca. Mexico D.F: McGraw-Hill, 1985. ISBN 9684516975.
- Lopez Jimeno, C., ed. Manual de túneles y obras subterráneas. Madrid: E.T.S.I. Minas - Universidad Politécnica de Madrid, 2011. ISBN 9788496140370.

Complementary:

- Carranza-Torres, C.; Fairhurst, C. "Application of the convergence-confinement method of tunnel design to rock masses that satisfy the Hoek-Brown failure criterion". Tunnelling and underground space technology [on line]. April-June 2000, vol. 15, no. 2, p. 187-213 [Consultation: 20/06/2017]. Available on: <[https://doi.org/10.1016/S0886-7798\(00\)00046-8](https://doi.org/10.1016/S0886-7798(00)00046-8)>.
- Palmstrom, Arild. "Measurements of and correlations between block size and rock quality designation (RQD)". Tunnelling and underground space technology [on line]. July 2005, vol. 20, no. 4, p. 362-377 [Consultation: 20/06/2017]. Available on: <<https://doi.org/10.1016/j.tust.2005.01.005>>.
- Sánchez, M. A.; Foyo, A.; Tomillo, C.; Iriarte, E. "Geological risk assessment of the area surrounding Altamira Cave: A proposed Natural Risk Index and Safety Factor for protection of prehistoric caves". Engineering geology [on line]. November 2007, vol. 94, no. 3-4, p. 180-200 [Consultation: 20/06/2017]. Available on: <<https://doi.org/10.1016/j.enggeo.2007.08.004>>.

Others resources: