

## 250403 - ANALESTR - Structural Analysis

Coordinating unit:	250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit:	751 - DECA - Department of Civil and Environmental Engineering
Academic year:	2019
Degree:	MASTER'S DEGREE IN CIVIL ENGINEERING (PROFESSIONAL TRACK) (Syllabus 2012). (Teaching unit Compulsory) MASTER'S DEGREE IN ENVIRONMENTAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) MASTER'S DEGREE IN STRUCTURAL AND CONSTRUCTION ENGINEERING (Syllabus 2015). (Teaching unit Optional)
ECTS credits:	7,5
Teaching languages:	Catalan, Spanish, English

### Teaching staff

Coordinator:	RAMON CODINA ROVIRA
Others:	GABRIEL BUGEDA CASTELLTORT, RAMON CODINA ROVIRA, SERGIO JIMÉNEZ REYES

### Degree competences to which the subject contributes

#### Specific:

- 8162. Knowledge of all kinds of structures and materials and the ability to design, execute and maintain structures and buildings for civil works.
- 8228. Knowledge of and competence in the application of advanced structural design and calculations for structural analysis, based on knowledge and understanding of forces and their application to civil engineering structures. The ability to assess structural integrity.
- 8230. The ability to plan, dimension, construct and maintain hydraulic works.

#### Transversal:

- 8562. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
- 8563. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

### Learning objectives of the subject



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### Study load

Theory classes:	32h 28,8m	17.32%
Practical classes:	16h 16,8m	8.68%
Laboratory classes:	16h 16,8m	8.68%
Guided activities:	2h 28,8m	1.32%
Self study:	120h	63.99%



## 250403 - ANALESTR - Structural Analysis

Total learning time: 187h	
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## 250403 - ANALESTR - Structural Analysis

31,2m	
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### Content

<p>Differential and Integral Formulation in Beam: Exact and Approximate Solutions</p>	<p>Learning time: 24h Theory classes: 4h Practical classes: 2h Laboratory classes: 4h Self study : 14h</p>
<p>Matrix Methods for Structural Analysis</p>	<p>Learning time: 36h Theory classes: 8h Practical classes: 5h Laboratory classes: 2h Self study : 21h</p>
<p>Resistant behavior of plates and shells</p>	<p>Learning time: 36h Theory classes: 8h Practical classes: 5h Laboratory classes: 2h Self study : 21h</p>
<p>Dynamic and Seismic Calculus</p>	<p>Learning time: 28h 47m Theory classes: 6h Practical classes: 3h Laboratory classes: 3h Self study : 16h 47m</p>
<p>Nonlinear behavior of the material: Beams, Frames and Plates</p>	<p>Learning time: 31h 12m Theory classes: 6h Practical classes: 3h Laboratory classes: 4h Self study : 18h 12m</p>

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### Bibliography

#### Basic:

R.K. Livesley. Métodos matriciales para càlculo de estructuras. Blume, 1970.

S.P Timoshenko y S. Woinowsky-Krieger. Teoria de placas y láminas. Urmo, 1975.

J.M. Canet y A. Barbat. Estructuras sometidas a acciones sismicas. CIMNE, 1988.

Oñate Ibañez de Navarra, E. Càlculo de estructuras por el método de los elementos finitos. Artes Gráficas Torres. Barcelona: CIMNE, 1992. ISBN 8487867006.

R. Argüelles. Càlculo de Estructuras, Vols. I,II,III. E.T.S Ingenieros de Montes, 1986.