

## 220261 - Advanced Machining Systems

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
 Teaching unit: 712 - EM - Department of Mechanical Engineering  
 Academic year: 2019  
 Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)  
 ECTS credits: 5 Teaching languages: Spanish

### Teaching staff

Coordinator: Xavier Salueña  
 Others: José Antonio Ortiz  
 Xavier Salueña

### Degree competences to which the subject contributes

#### Specific:

1. Ability to learn and understand the dynamic phenomena and its formulation for their application in the development of each of the stages of conception, design, calculation and simulation of fluid dynamic.
2. Ability to learn and understand advanced fluid dynamic processes, power transmission and advanced manufacturing for application in industrial facilities based on the product and production volume elements, machines and vehicles.
3. Ability to learn and understand design tools like CAD / CAM / CAE, CFD numerical simulation and dynamic simulation for design and advanced computing facilities and fluid dynamic systems.
4. Ability to know the laws, regulations and directives in force whenever assessing the environmental implications, energy, social and ethical professional activity.
5. Ability to learn and understand the dynamic phenomena and its formulation for application in the development of each of the stages of conception, design and mechanical calculations.
6. Ability to learn and understand numerical simulation tools for the design, calculation and fabrication of components, systems and mechanical installations.

### Learning objectives of the subject

#### Study load

Total learning time: 125h	Hours large group:	30h	24.00%
	Hours small group:	15h	12.00%
	Self study:	80h	64.00%

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### Content

(ENG) Introducció a la fabricació avançada	Learning time: 12h Theory classes: 2h Laboratory classes: 2h Self study : 8h
(ENG) Programació en CNC y CAD-CAM	Learning time: 37h Theory classes: 4h Laboratory classes: 13h Self study : 20h
Description:	
(ENG) Obtenció y càlculo de utillajes de piezas metálicas por conformado.	Learning time: 6h Theory classes: 2h Self study : 4h
(ENG) Diseño de piezas para la fabricación, sistemas de prototipaje avanzado.	Learning time: 6h Theory classes: 2h Self study : 4h
(ENG) Cálculo y diseño avanzado de utillajes e instalaciones para el conformado de piezas de chapa.	Learning time: 12h Theory classes: 4h Self study : 8h
(ENG) Cálculo y diseño avanzado de utillajes e instalaciones para piezas de moldeo.	Learning time: 12h Theory classes: 4h Self study : 8h

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<p>(ENG) Cálculo y diseño avanzado de utillajes para la fabricación de piezas de plástico.</p>	<p>Learning time: 6h Theory classes: 2h Self study : 4h</p>
<p>(ENG) Sistemas avanzados de mecanizado.</p>	<p>Learning time: 22h Theory classes: 6h Self study : 16h</p>
<p>(ENG) Sistemas avanzados de acabado superficial.</p>	<p>Learning time: 6h Theory classes: 2h Self study : 4h</p>
<p>(ENG) Sistemas avanzados de corte y soldadura.</p>	<p>Learning time: 6h Theory classes: 2h Self study : 4h</p>

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### Planning of activities

(ENG) ASISTENCIA A SESIONES DE PRÁCTICAS	Hours: 15h Laboratory classes: 15h
(ENG) EXAMEN 1ER PARCIAL	Hours: 24h Theory classes: 8h Self study: 16h
(ENG) PROYECTO CNC O CAM	Hours: 26h Theory classes: 6h Self study: 20h
(ENG) EXAMEN FINAL	Hours: 40h Theory classes: 16h Self study: 24h
(ENG) PROYECTO FABRICACIÓN PIEZA	Hours: 20h Self study: 20h

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### Bibliography

#### Basic:

- Steen, W.M.; Mazumder, J. Laser material processing. 4th ed. New York: Springer, 2010. ISBN 9781849960618.
- Salueña, X.; Nápoles, A. Tecnología mecánica [on line]. 2ª ed. Barcelona: Edicions UPC, 2001 [Consultation: 08/01/2016]. Available on: <<http://hdl.handle.net/2099.3/36437>>. ISBN 8483014491.
- Arnone, Miles. Mecanizado de alta velocidad y gran precisión. Bilbao: El MT, 2000. ISBN 9788431404772.
- Ciurana, Q.; Fernández, A.; Monzón, M. (eds.). Guía de tecnologías de rapid manufacturing. 2ª ed. Girona: Documenta Universitaria, 2008. ISBN 9788496742185.
- Gastrow, Hans. Moldes de inyección para plásticos. Barcelona: Hanser, 1992. ISBN 848745402X.
- Florit, Antonio. Tratado de matricería. Tecnofisis, 2009. ISBN 9788461268887.
- Ehmann, Kornel F. [et al.]. Micromanufacturing: international research and development. Dordrecht: Springer, 2007. ISBN 9781402059483.
- Cuatrecasas Arbós, Ll. Diseño de procesos de producción flexible. 2ª ed. Madrid: TPG Hoshin, 2000. ISBN 8487022251.
- Koellhoffer, L.; Manz, A.F.; Hornberger, E.G. Manual de soldadura. México: Limusa, 1998. ISBN 9681849264.
- Kalpakjian, S.; Schmid, S.R. Manufactura, ingeniería y tecnología [on line]. 5ª ed. México: Pearson Educación, 2008 [Consultation: 04/10/2018]. Available on: <[http://www.ingebook.com/ib/NPcd/IB\\_BooksVis?cod\\_primaria=1000187&codigo\\_libro=5323](http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=5323)>. ISBN 9789702610267.

#### Complementary:

- Dashchenko, Anatoli (ed.). Manufacturing technologies for machines of the future: 21st century technologies. Berlin: Springer, 2003. ISBN 3540434925.

#### Others resources: