

Course guide

240226 - 240AU064 - Innovation and Development in Automotive

Last modified: 13/03/2025

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 732 - OE - Department of Management.

Degree: MASTER'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2019). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 3.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Calleja Sanz, Gema

Others: Vila Castañer, Jordi

PRIOR SKILLS

Knowledge of production technology, product engineering, economics, and business administration at grade level

REQUIREMENTS

Minimum level of knowledge of Spanish: B2

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CEAU 1. (ENG) Realitzar models d'enginyeria, aplicar mètodes innovadors en la resolució de problemes i aplicacions informàtiques adequades, per al disseny, simulació, optimització i control de processos i sistemes.

CEAU 2. (ENG) Explicar les bases de la indústria de l'automoció, el seu contexte econòmic i legislatiu, així com la seva evolució.

CEAU 7. (ENG) Gestionar la investigació, desenvolupament i innovació tecnològica, atenent a la transferència de tecnologia i els drets de propietat.

CEAU11. (ENG) Planificar, portar un seguiment i controlar el desenvolupament de productes, aplicant coneixements d'electricitat, electrònica i els sistemes d'emmagatzematge d'energia.

CEAU15. (ENG) Realitzar, presentar i defensar un exercici original realitzat individualment davant d'un tribunal universitari, consistent en un projecte integral d'Enginyeria d'Automoció de naturalesa professional en què se sintetitzin les competències adquirides en els ensenyaments.

Transversal:

CTAU1. (ENG) EMPRENEDORIA I INNOVACIÓ: Conèixer i comprendre l'organització d'una empresa i les ciències que regeixen la seva activitat; tenir capacitat per comprendre les normes laborals i les relacions entre la planificació, les estratègies industrials i comercials, la qualitat i el benefici.

CTAU3. (ENG) TREBALL EN EQUIP: Ser capaç de treballar com a membre d'un equip interdisciplinari, ja sigui com un membre més, o realitzant tasques de direcció, amb la finalitat de contribuir a desenvolupar projectes amb pragmatisme i sentit de la responsabilitat, assumint compromisos tenint en compte els recursos disponibles.

TEACHING METHODOLOGY

Dynamic master lecture
Autonomous learning
Project-based learning
Design Thinking
Team work
Case Study-based learning

LEARNING OBJECTIVES OF THE SUBJECT

The lessons are built on practical knowledge outlining how technology innovation is managed in real companies. The subject covers specifically Innovation Management through acquisition of new technologies and innovations. Additionally, this subject aims to provide the student with the necessary knowledge to deal with management, acquisition and protection of new research-based knowledge and innovations, as the base for ensuring a sustainable competitive advantage for companies in their market.

Specific objectives:

1. Identify the dynamics of the innovation processes in its different typologies and components
2. Understand Innovation Management tools and how to proceed to launch new products and services
3. Know how to protect innovation through different mechanisms

STUDY LOAD

Type	Hours	Percentage
Hours small group	9,0	12.00
Hours large group	18,0	24.00
Self study	48,0	64.00

Total learning time: 75 h

CONTENTS

1. TECHNOLOGY AND STRATEGY

Description:

Concept and types of technology. New technology trends and their impact in the organizations. Technology life cycle. Technology and strategy in a company.

Full-or-part-time: 83h

Theory classes: 8h

Self study : 75h

2. INNOVATION

Description:

Innovation and technology change. The technology innovation process: models.
Invention and innovation. Creativity and innovation. Diffusion of the innovation. The design in a company.

Full-or-part-time: 12h

Theory classes: 4h

Practical classes: 2h

Self study : 6h

3. INNOVATION AND ORGANIZATIONS

Description:

Main elements and drivers influencing innovation in a company. Innovation in SMEs (Small-Medium Enterprises). R & D department: basic characteristics and organization. Relations of the R & D department.

Full-or-part-time: 12h

Theory classes: 4h

Practical classes: 2h

Self study : 6h

4. TECHNOLOGY TRANSFER

Description:

Purchase and sell of technology. Different methods of technology transfer. Technological alliances. The problem of technology adoption.

Full-or-part-time: 6h

Theory classes: 2h

Self study : 4h

5. PROTECTION OF INNOVATION

Description:

Patent and commercial secret. Legal regime to protect inventions and innovations. Protection of distinctive signs. Licensing.

Full-or-part-time: 6h

Theory classes: 2h

Self study : 4h

GRADING SYSTEM

Course grade = 50% Course team project + 45% Class activities + 5% Class participation

Course project = 0,7*Written report+ 0,3*Pitch Presentation

Where:

Written report: Report of a technology innovation proposal, ideated by the students. The written report is done in groups, and all the group members share the same grade.

Pitch Presentation: Oral presentation of the innovation opportunity. The presentation is graded in groups and the grade is scored individually.

Deliverables on campus (45%, average grade of all the deliverables: Course project milestones, practical exercises, tech trends, other activities).

The act of reevaluation will be the delivery of a report. If the student who attends the reevaluation does not pass the course, the highest grade between the result of the ordinary evaluation (if any) and the reevaluation is kept.

BIBLIOGRAPHY

Basic:

- Christensen, Clayton M. El dilema de los innovadores : [cuando las nuevas tecnologías pueden hacer fracasar a las grandes empresas]. Buenos Aires: Granica, cop. 1999. ISBN 9506412936.
- Moore, Geoffrey. Desafío de Darwin. Madrid: ,Empresa Activa, 2007. ISBN 9788496627253.
- Drucker, Peter F. La innovación y el empresario innovador : la práctica y los principios. Barcelona: Apóstrofe, 1997. ISBN 8445500996.
- Christensen, Clayton M; Raynor, Michael E. La Solución de los innovadores : cómo crear y mantener un entorno satisfactorio. Madrid [etc.]: McGraw-Hill, cop. 2004. ISBN 8448141903.
- Ulrich, Karl T; Eppinger, Steven D; Yang, Maria C. Product design and development. Seventh edition. New York, NY: McGraw-Hill Education, [2019]. ISBN 9781260566437.
- Sage, Lee A. Winning the innovation race : lessons from the automotive industry's best companies. New York: John Wiley & Sons, 2000. ISBN 0471333468.
- Davenport, Thomas H. Innovación de procesos : reingeniería del trabajo a través de la tecnología de la información. Madrid: Díaz de Santos, 1996. ISBN 8479782706.