Course guide
300268 - SERVICE - Service Engineering

Last modified: 11/05/2026

Unit in charge: Castelldefels School of Telecommunications and Aerospace Engineering
Teaching unit: 744 - ENTEL - Department of Network Engineering.

Degree: MASTER'S DEGREE IN APPLIED TELECOMMUNICATIONS AND ENGINEERING MANAGEMENT (MASTEAM) (Syllabus 2015). (Optional subject).
ERASMUS MUNDUS MASTER IN COMMUNICATIONS ENGINEERING AND DATA SCIENCE (CODAS 1) (Syllabus 2024). (Compulsory subject).
MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE FOR CONNECTED INDUSTRIES (AI4CI) (Syllabus 2025). (Optional subject).

Academic year: 2026 **ECTS Credits:** 3.0 **Languages:** English

LECTURER

Coordinating lecturer: Alcober Segura, Jesus Angel

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:
06 RES. (ENG) Resolver problemas y mejorar procesos en cualquier ámbito social a partir de la aplicación de las TIC, integrando conocimientos de diversos ámbitos y aplicando ingeniería de alto nivel tecnológico.
03 DIS. (ENG) Diseñar aplicaciones de alto valor añadido basadas en las Tecnologías de la Información y las Comunicaciones (TIC), aplicadas a cualquier ámbito de la sociedad.

Transversal:
03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
01 EIN. ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.

TEACHING METHODOLOGY

The lectures consist essentially on lectures by the professor with the active participation of students, whereby working certain parts of the course on their own (self-learning) from materials provided by teachers (papers, documents on use cases / products, book chapters, etc.).

LEARNING OBJECTIVES OF THE SUBJECT

1. To analyse breakthrough services in order to understand the operations of networked service firms.
2. To develop an understanding of the state of the art of service management thinking including service systems and the service system worldview in order to develop a service mindset.
3. To develop an awareness of the opportunities that information technology can have for enhancing service firms' competitiveness.
4. To understand new service development from both a product and process perspective.
5. To appreciate the opportunities in service innovation.
6. To understand the basis of industry reference models that provide a best practice in structures, processes, activities, knowledge and skills, in the ICT and telecommunications industry

STUDY LOAD

Type	Hours	Percentage
Hours small group	27,0	36.00
Self study	48,0	64.00

Total learning time: 75 h

CONTENTS

Introduction to service engineering

Description:
This lecture introduces the basic concepts in service engineering, such as definitions of services, definition of service firms, role of services in an economy, classification of services and service systems, service-dominant logic and value to customers.

Related activities:
• Exercise about classification of services

Full-or-part-time: 12h 30m
Theory classes: 3h
Laboratory classes: 1h 30m
Self study : 8h

Service strategy

Description:
The Service strategy lecture aims at aspects such as strategic service vision, competitive environment of services, competitive service strategies, strategic analysis using SWOT analysis and Porter forces (1985), competitive role of information and, finally, stages in service firm competitiveness.

Related activities:
• Exercise about generic strategies

Full-or-part-time: 12h 30m
Theory classes: 3h
Laboratory classes: 1h 30m
Self study : 8h

Service development

Description:
The service development lecture provides tools to students to apply the service strategy, using new service development, levels of service innovation using a) nsd process cycle (technology as innovation driver) and b) service innovation process (service design elements), service blue printing. After that, two approaches about how to design a service system are explained: a) production-line approach and b) customer as co-producer. The next step is about service quality, starting with a definition and identification of service gaps: gap model, and using strategies for closing the gaps and measurement of service quality: servqual. Lastly, statistical process control are explained using control charts. We finish the lecture explaining supporting facility: servicescape definition and facility layout process analysis.

Related activities:
• Exercise about service quality

Full-or-part-time: 12h 30m
Theory classes: 3h
Laboratory classes: 1h 30m
Self study : 8h

Service Planning

Description:
The lecture about Service planning deals with methods of forecasting, and managing queues. The methods of forecasting explained are subjective methods (delphi method), causal models (regression analysis) and time series models (n-period moving average and exponential smoothing). After that, we overview strategies for managing demand and capacity, and specifically techniques of managing queues, from different views: 1) psychological view (tools for managing queues), 2) queuing systems (systematic view) with formalization of queuing systems and queue configuration and 3) economic view (capacity planning and queuing models)

Related activities:
Exercises on service planning

Full-or-part-time: 12h 30m
Theory classes: 3h
Laboratory classes: 1h 30m
Self study : 8h

Services and Information Systems

Description:
The lecture about Services and Information Systems introduces briefly to IT Infrastructure Library® (ITIL), specifically to ITIL Service Lifecycle (ITIL V3), and its 5 books: Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement. Basic concepts are presented, such as assets, Service Package, Portfolio. In a more detail, Service Strategy and Service Design are explained. In ITIL Service Strategy, concepts such as Strategy Management Process, Strategic Assessment, Strategy Generation (Positioning and Patterns) and Strategy Execution are outlined. In ITIL Service Design, the following concepts are explained: Service Composition and Key processes. Lastly, two IT Service Management Frameworks are outlined: COBIT and eTOM

Related activities:
Exercise about ITIL

Full-or-part-time: 12h 30m
Theory classes: 3h
Laboratory classes: 1h 30m
Self study : 8h

Service Network Systems

Description:
The lecture about Service Network Systems, IT Service Infrastructures are explained, and three key concepts are related each other: Service-Oriented Architecture , Cloud-computing and Network infrastructure evolution hot topics such as SDN, Virtualization and NFV.

Related activities:
Exercise about IT Service infrastructures and virtualization

Full-or-part-time: 12h 30m
Theory classes: 3h
Laboratory classes: 1h 30m
Self study : 8h

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

BIBLIOGRAPHY

Basic:
- Fitzsimmons, James A; Fitzsimmons, Mona J; Bordoloi, Sanjeev. Service management : operations, strategy, information technology. 8th ed., international ed. New York: McGraw-Hill, 2014. ISBN 9780078024078.