



Universitat de Lleida

# DEGREE CURRICULUM **SERVICES I**

Coordination: MEDRANO MARTORELL, MARCO

Academic year 2016-17

## Subject's general information

<b>Subject name</b>	SERVICES I			
<b>Code</b>	102311			
<b>Semester</b>	1st Q(SEMESTER) CONTINUED EVALUATION			
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Typology</b>	<b>Modality</b>
	Bachelor's Degree in Mechanical Engineering	4	OPTIONAL	Attendance-based
	Master's Degree in Industrial Engineering		COMPLEMENTARY TRAINING	Only examination
<b>ECTS credits</b>	6			
<b>Groups</b>	1GG			
<b>Theoretical credits</b>	3			
<b>Practical credits</b>	3			
<b>Coordination</b>	MEDRANO MARTORELL, MARCO			
<b>Department</b>	INFORMATICA I ENGINYERIA INDUSTRIAL			
<b>Teaching load distribution between lectures and independent student work</b>	60 h of lectures (40%) 90 h independent student work (60%)			
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.			
<b>Language</b>	English			
<b>Distribution of credits</b>	Marc Medrano 6 ECTS			
<b>Office and hour of attention</b>	To be specified on the first day of class.			

Professor/a (s/es)	Adreça electrònica professor/a (s/es)	Crèdits	Horari de tutoria/lloc
MEDRANO MARTORELL, MARCO	mmedrano@diei.udl.cat	7,2	To be agreed with the professor by email

## Subject's extra information

This subject requires continuous work throughout the semester in order to achieve the proposed objectives. It is recommended to visit frequently the site of the subject on the Virtual Campus, since most of the information and announcements can be found there. This is a subject that belongs to module "Optative subjects", and to the subject "Services". It is recommended that the students contact the professor directly using the email, rather than using the internal email services within the Campus Virtual. There are no previous requirements for this subject.

## Learning objectives

- Be able to find, understand and synthesize information in foreign language.
- Provide the students an overview of the energy situation in the world and future prospects.
- Provide the students with the basic knowledge and current legislation concerning the various services of the buildings.
- Provide the students with the knowledge of the distribution and the elements that form the various services.
- Become familiar with the applicable technical and legal language.
- Understand the concepts associated to psychrometry and understand the importance of latent heat in air conditioning services.
- Be able to pre-size water, air conditioning, drainage, electrical, steam, and cogeneration installations, as well as renewable energy systems, applying the theoretical and basic fundamentals of the different specialities.

## Competences

### University of Lleida strategic competences

- **UdL2** Command of a foreign language..

### Cross-disciplinary competences

- **EPS4**. To have the skills required to undertake new studies or improve the training with self-direction.
- **EPS9**. Capacity for unidisciplinary and multidisciplinary teamwork.

### Specific competences

- **GEM-EPS31**. Capacity to design HVAC installations (heating, ventilation and air conditioning).
- **GEM-EPS32**. Applied knowledge to distributed energy generation and energy use.
- **GEM-EPS33**. Capacity of analysis of energy systems, optimization and integration

## Subject contents

1. Introduction about energy in the World
2. Gas Installations
3. Electrical Installations
4. Fire protection

- 5. Distribution and supply of potable water
- 6. Sanitation
- 7. Common infrastructures of telecommunications (CIT)
- 8. Air conditioning
- 9. Steam Installations
- 10. Cogeneration
- 11. Renewable energies

## Methodology

The methodological axes of the course will be divided into:

1.-Theoretical sessions where the professor will present theoretical contents needed for the acquisition of knowledge and for the proper development of the practical sessions.

2.-Hands-on problem solving sessions, where the professor will solve some examples, but where students will take an active part in the learning process working in small groups or individually.

Students have the responsibility to strengthen their knowledge autonomously based on the teaching material provided or recommended by the professor.

## Development plan

The development plan will follow the order of the contents:

Week	Methodology	Topic	Lecture Hours	Autonomous work hours
1	Lecture	Subject presentation and 1. Introduction	4	6
2	Lecture	2. Gas Installations	4	6
3-4	Lecture. Resolution of problems.	3. Electrical Installations	8	12
5	Lecture	4. Fire protection	2	3
5-6	Lecture. Resolution of problems.	5. Distribution and supply of potable water	6	9
7-8	Lecture. Resolution of problems.	6. Sanitation	5	7.5
8	Lecture	7. Common infrastructures of telecommunications (CIT)	3	4.5

9		Evaluation. Written test.		
10		Evaluation. Oral presentation of scientific paper.	4	6
11-12	Lecture. Resolution of problems. Lab practice.	8. Air conditioning	6	9
12-13	Lecture. Resolution of problems.	9. Steam Installations	6	9
14	Lecture. Resolution of problems.	10. Cogeneration	4	6
15	Lecture.	11. Renewable energies	4	6
16-19		Evaluation. Written Test. Recovery		

## Evaluation

### ACTIVITY OF EVALUATION 1: FIRST PARTIAL (individual, written)

- 35%

- Grade > 3

### ACTIVITY OF EVALUATION 2: SCIENTIFIC PAPER EXPOSITION (individual, oral)

- 15%

### ACTIVITY OF EVALUATION 3: SCIENTIFIC PAPER REPORT (written, group)

- 15%

- Group activity

### ACTIVITY OF EVALUATION 4: SECOND PARTIAL (individual, written)

- 35%

- Grade > 3

There will be only recovery for the individual written exams.

## Bibliography

### Recommended bibliography

- Arizmendi Barnes, Luis Jesús (2003): "Cálculo y Normativa Básica de las Instalaciones en los edificios". Tomo I y II. Editorial EUNSA.
- Huidobro, José M. Manual de Telecomunicaciones. Ed. Ra-Ma
- Lagunas Marqués, Ángel – Instalaciones eléctricas de baja tensión en edificios de viviendas-Ed. Paraninfo –

Madrid – 2003

- Martín, F. INSTALACIONES ELÉCTRICAS. Fundación Escuela de la Edificación.
- Vázquez Moreno, Javier. Herranz Aguilar, Juan Carlos. “Manual práctico de instalaciones en edificación. Tomo I. Instalaciones hidráulicas”. Editorial LITEAM. 1ª edición. Año 2001. ISBN: 84-95596-05-9R
- Vázquez Moreno, Javier. Herranz Aguilar, Juan Carlos. “Manual práctico de instalaciones en edificación. Tomo II. Instalaciones energéticas”. Editorial LITEAM. 1ª edición. Año 2001. ISBN: 84-95596-06-7R
- Vázquez Moreno, Javier. Herranz Aguilar, Juan Carlos. “Manual práctico de instalaciones en edificación. Tomo III. Instalaciones eléctricas.” Editorial LITEAM. 1ª edición. Año 2001. ISBN: 84-95596-04-0
- GEA 2012 – Global Energy Assessment. Toward a Sustainable Future. Ed. Thomas B. Johansson, Anand Patwardhan, Nenojsa Nakicenovic, Luisa Gomez-Echeverri. International Institute for Applied Systems Analysis (IIASA). Cambridge University Press, 2012.
- ETP 2012 – Energy Technology Perspectives 2012. Pathways to a Clean Energy System. International Energy Agency (IEA), 2012.