



Universitat de Lleida

DEGREE CURRICULUM **SERVICES I**

Coordination: MEDRANO MARTORELL, MARCO

Academic year 2017-18

Subject's general information

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

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
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.

It is **COMPULSORY** that the students bring the following elements of individual protection (EPI) to the practices at the laboratory.

- Blue laboratory gown from UdL (unisex)
- Protection glasses
- Mechanical protection gloves

They can be purchased through the shop Údels of the UdL:

C/ Jaume II, 67 baixos
Centre the Cultures i Cooperació Transfronterera

<http://www.publicacions.udl.cat/>

The use of other elements of protection (for example caps, masks, gloves of chemical or electrical risk, etc.) will depend on the type of practice to be done. In that case, the teacher will inform of the necessity of specific EPI.

Not bringing the EPI's described or not fulfilling the norms of general security that are detailed below imply that the student can not access to the laboratories or have to go out of them. The no realisation of the practices for this reason imply the **consequences in the evaluation** of the subject that are described in this course guide.

GENERAL NORMS OF SECURITY IN LABORATORY PRACTICES

- Keep the place of realisation of the practices clean and tidy. The table of work has to be free from backpacks, folders, coats...
- No short trousers or short skirts are allowed in the laboratory.
- Closed and covered footwear is compulsory in the laboratory.
- Long hair needs to be tied.
- Keep the laboratory gown laced in order to be protected from spills of chemicals.
- Bangles, pendants or wide sleeves are not allowed as they can be trapped.
- Avoid the use of contact lenses, since the effect of the chemical products is much bigger if they enter between the contact lense and the cornea. Protection over-glasses can be purchased.
- No food or drink is allowed in the laboratory.
- It is forbidden to smoke in the laboratories.

- Wash your hands whenever you have contact with a chemical product and before going out of the laboratory.
- Follow the instructions of the teacher and of the laboratory technicians and ask for any doubt on security.

For further information, you can check the following document of the *Servei de Prevenció de Riscos Laborals de la UdL*: <http://www.sprl.udl.cat/alumnes/index.html>

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.

