Academic Project of the Subject

Subject	SUSTAINABILITY AND EXCELLENCE		
General subject	SUSTAINABILITY		
Module	2. MANAGEMENT AND OPTIMIZATION OF THE PRODUCTION AND SUSTAINABILITY		
Degree	MASTER IN CHEMICAL ENGINEERING		
Plan	542	**Code**	53745
Time period	1er SEMESTER	**Type/Character**	MANDATORY
Level/Cycle	1º	**Course**	1º
Credits ECTS	6		
Language	ENGLISH		
Professor/s in charge	JUAN GARCÍA SERNA		
Department(s)	INGENIERÍA QUÍMICA Y TECNOLOGÍA DEL MEDIO AMBIENTE		
Contact (E-mail, pone)	jgserna@iq.uva.es 983 18 49 34		

1. Situation / Concept of the subject

1.1 Context

The subject "SUSTAINABILITY AND EXCELLENCE" forms in itself the subject "Sustainability" that is part of Module 2 "MANAGEMENT AND OPTIMIZATION OF PRODUCTION AND SUSTAINABILITY".

The industrial revolution led to acceleration 2.0, with a large number of machines that increased consumer goods and trade. Subsequently, since the 90s, the 3.0 acceleration motivated by Internet, opening of borders, etc. has been experienced. being the information and the experiences the base. In the last five years (2015 onwards) a new 4.0 acceleration is under way, where block economy, collaborative work and innovation are the key.

Designing for this new moment and fulfilling the expectations of a tremendously accelerated, globalized and connected world requires understanding the basis of the philosophy of sustainability. In this context so current and so relevant the subject is framed.

The student will receive more than one challenge, one in particular will be the basis of the subject: "the creation of a sustainable product idea and its design to create the possible company".

Students can participate with their ideas in innovation competitions, such as the "Prometeo Awards" of FunGe UVa. Students from previous years have already achieved some of them.

1.2 Relation with other subjects

The subject of "Sustainability and Excellence" aims to expand the student's knowledge towards a practical level of creativity.

The subject has a direct relationship with:

- Chemical Product Engineering
- Control of Business Management

Indirectly this subject will help students to have a basis for the possible "Innovation Work" and the "Master's Thesis".

1.3 Prerequisites

This subject does not have specific prerequisites, only an open mind to be able to innovate and create.

2. Competences

2.1 General

CG07. Integrate knowledge and face the complexity of making judgments and decision making, based on incomplete or limited information, including reflections on the social and ethical responsibilities of professional practice.

CG08. Lead and define multidisciplinary teams capable of solving technical changes and management needs in national and international contexts.

CG09. Communicate and discuss proposals and conclusions in multilingual, specialized and non-specialized forums, in a clear and unambiguous way.

CG11. Possess the skills of autonomous learning to maintain and improve the skills of chemical engineering that allow the continuous development of the profession.

2.2 Specific

CEO02. Direct and manage the organization of work and human resources applying criteria of industrial safety, quality management, occupational risk prevention, sustainability, and environmental management.

CEO04. Adapt to the structural changes of society motivated by factors or phenomena of economic, energetic or natural nature, to solve the problems derived and contribute technological solutions with a high commitment to sustainability.

CEO05. Direct and carry out verification, control of facilities, processes and products, as well as certifications, audits, verifications, tests and reports.

3. Objetives

That the student develops knowledge and skills in:

- Sustainability, principles, disciplines and applications.
- Excellence and its management.
- Innovation, creativity and entrepreneurship.

More specifically the student will be able to:

- Know the meaning of the term "sustainability" within Chemical Engineering field and apply it to the processes and products.
- Develop creativity in the design of sustainable products and processes.
- Use tools that help in the development of innovative process and product solutions within the framework of sustainability.
- Manage excellence in the field of Chemical Engineering.
- Innovate in products, processes and production systems within the framework of Chemical Engineering.
- Acquire capabilities for verification, control of facilities, processes and products, as well as certifications, audits, verifications, tests and reports.

4. Contents

The subject is developed in English language.
The contents are divided into 6 topics:

TOPIC 1 - DEFINITION OF SUSTAINABILITY, PRINCIPLES AND INSPIRING DISCIPLINES
TOPIC 2 - SUSTAINABILITY METRICS
TOPIC 3 - EXCELLENCE IN THE INDUSTRY & QUALITY MANAGEMENT
TOPIC 4 - CREATIVITY AND INNOVATION
TOPIC 5 - ECONOMIC ESTIMATION OF THE INVESTMENT
TOPIC 6 - ENTERPRENEURSHIP FOR THE PROCESS INDUSTRY: CASE STUDY

5. Teaching methods and methodological principles

The subject is eminently participatory with a horizontal knowledge between student and teacher.
The fundamental objective of the applied teaching method is that the student gains curiosity about the changing world in which we live and its relationship with sustainability and, obviously, with Chemical Engineering.

- Classes on blackboard/whiteboard and Powerpoint/Keynote presentations
- Brainstorming and other ideas generation methods

- Viewing motivating videos (e.g. TED talks, etc.)
- Seminars from professionals of innovation and entrepreneurship (e.g. Scientific Park of the University of Valladolid).
    - Workshop on innovation and university
    - Workshop on “Creativity”
    - Workshop on “CANVAS tool” for business plan creation
- Seminars for the realization of the sustainable business idea

6. Dedicational time of the student to the subject

PRESENTIAL ACTIVITIES	HORAS	NON PRESENTIAL ACTIVITIES	HOURS
Theory	20	Study and autonomous work individual	60
Practice in the aula	14	Study and autonomous work in groups	30
Seminars	20		
Laboratories	0		
Tutorial service	4		
Evaluation (out of the official examination period)	2		
Total face-to-face activities	**60**	**Total non face-to-face activities**	**90**

7. System and characteristics of the evaluation

INSTRUMENT/PROCEDURE	VALUE IN FINAL MARK	REMARKS
TASK 1	10%	
TASK 2	35%	Preparation of a sustainable product idea and company. It will be valued: • Idea related to Chemical Engineering • Sustainability • Business plan • Participation in competitions of business ideas or similar (optional).
ORAL DEFENSE (around Task 2)	10%	It will be considered: • Clarity in presentation • Simplicity • Good defence of the idea
WRITTEN EXAMINATION	25%	It will consist of 4 questions / questions to be developed on the contents of the subject.
ATTITUDE IN CLASS	20%	It will be considered: • Participation in class • Generation of ideas • Attitude and relation with the other class mates

8. Final remarks

Non applicable.