

<b>Subject</b>	PHOTOVOLTAIC AND OPTOELECTRONIC MANUFACTURING TECHNOLOGY
<b>Credits</b>	5 ECTS (2T+3P)
<b>Character</b>	PV-cells track
<b>Semester</b>	1st
<b>Language</b>	English

### Competences

CG5 – Information management: to search for and manage appropriate bibliographic resources efficiently, to learn to continue studies in a largely autonomous way as a basis for future research and innovation activity.

CG7 - Work in international contexts: To carry out a substantial research process with academic seriousness and integrity, integrated in an R+D+i group with international projection

CG8 - Apply methodologies, procedures, tools and state-of-the-art standards for the creation of new technological components; build new hypotheses and models, evaluate them and apply them to problem solving.

CG9 - Communicate judgments and knowledge to specialized and non-specialized audiences in a reasoned, clear and unambiguous manner.

CB6 - Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context

CB7 - Students should be able to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.

CB8 - Students are able to integrate knowledge and face the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities related to the application of their knowledge and judgments.

CB10 - That students possess the learning skills that will enable them to continue studying in a manner that will be largely self-directed or autonomous.

CT3 - Use of the English language: understand the contents of lectures, conferences and seminars in English; write reports and scientific-technical articles in English using computer tools; make public presentations in English of research work, results and conclusions, for example, in the subjects of the Master or in congresses of a mostly international nature or in stays in foreign centers, all with the help of audiovisual computer media.

CE1 - Understanding, analyzing and judging the relevance of any contribution in this field, in relation to its social, energetic and scientific-technical environment.

CE3 - Realization, development and innovation of technological processes for the manufacture of photovoltaic devices..

### Outcomes

RA04 - Ability to analyze results

RA05 - Relating basic principles to practical aspects

RA15 - Training in cost calculation techniques

RA24 - Knowledge of the physical fundamentals of solar cells

RA25 - Ability to understand the basic operation of different types of solar cells, both current and those that will emerge in the near future.

RA45 - To enable the student to make public presentations

RA46 - To train the student to work as part of a team

RA47 - To learn to argue convincingly

RA70 - To know the manufacturing processes of solar cells

RA71 - To become familiar with the practical aspects of manufacturing photovoltaic devices.

### **Description and syllabus**

Study of technological processes in the manufacture of solar cells. Manufacture of silicon solar cells, including diffusion processes, chemical attacks, deposition of metal layers. Manufacturing processes of thin film, organic and hybrid cells and III-V semiconductor solar cells.

Syllabus:

1. Introduction to solar cell manufacturing
2. Silicon solar cell manufacturing technologies.
3. Thin film solar cell manufacturing technologies
4. III-V semiconductor based solar cell manufacturing technologies.
5. Manufacturing costs
6. Experimental solar cell fabrication sessions