COURSE SYLLABUS 2019-20

Basic information on the course			
Course:	Bioprocess laboratory (UAL)		
Course code:	70801206	Plan:	Master´s Degree in Chemical Engineering
Academic Year:	2019-2020	Undergraduate/Graduate:	Graduate
Degree Year:	1	Type:	Optional
Duration:	Second semester		

TIME DISTRIBUTION ACCORDING TO REGULATIONS	
Credits:	3
Total time:	75
USE OF LEARNING PLATFORM:	Support for teaching

TEACHERS			
Name	Tania Mazzuca Sobczuk		
Departement	Chemical Engineering		
Building	CITE IIA		
Office	1.31		
Telephone	950015901	E-mail (institutional)	tmazzuca@ual.es
Website			
Name	Celeste Brindley Alias		
Departement	Chemical Engineering		
Building	CITE IIA		
Office	2.70		
Telephone	950014110	E-mail (institutional)	cbrindle@ual.es
Website			

OTHER IMPORTANT INFORMATION

Content justification

Bioprocess Engineering is the modification or application of renewable raw mmaterials to produce value-added products. This engineering currently has multiple applications in continuously developing areas such as the pharmaceutical industry, the food and bioremediation among others. It is then necessary that future professionals have mastered the knowledge, skills and techniques necessary to design, carry out and analyze and discuss experiments related to this type of bioprocesses.

Courses related in Study Plan

This subject is closely related to other subjects of the block of Engineering Processes and products listed in the memory of the master.

Pre-required knowledge

It is recommended to have a good management of basic laboratory techniques such as preparation of solutions, skills for report writing and management of computers. It is advisable to have acquired knowledge of the kinetics of the growth of microorganisms, basic operations in general and chemical reactors.

COMPETENCES

Basic and general competences

Skills hub of the University of Almería
Basic skills

Specific competences

CG4 - carry out appropriate research, undertake design and direct the development of engineering solutions, in new or little-known environments linking creativity, originality, innovation and technology transfer. (General)
CB6 - own and understand knowledge that can provide a base or opportunity to be original in the development and/or application of ideas, often in a context of research. (General)
CT1 - teamwork by promoting the development of skills in human relations. (Cross)
CT4 - communicating scientific concepts and technicians using the most common audiovisual media, developing oral communication skills. (Cross)
CE1 - apply knowledge of mathematics, physics, chemistry, biology and other natural sciences, gained by study, experience, and practice, with critical reasoning to establish economically viable solutions to technical problems.
CE2 - designing products, processes, systems and services of the chemical industry, as well as the optimization of others already developed, on the technological basis the various areas of chemical engineering, comprehensive processes and transport phenomena, separation and nuclear, chemical, electrochemical and biochemical reaction engineering operations.

LEARNING OUTCOMES

Designing experiments to fully perform a simple BioProcess, from raw materials to the product. Kinetic Modeling of growth of micro-organisms, production of bioproducts, etc... applying computer tools.

Interpreting and discussing the results of the experiments with existing literature and similar experiments. Summarizing and presenting the results. Students will have in the lab everything needed to fully develop the BioProcess from the raw material to the product and carry on the basic operation chosen at each time. Dynamic processes canbe modeled with the help of mathematical software (Matlab, Sigmaplot, Mathcad, Excel, etc.) provided by teachers using computers in a specific room for this purpose. Students will perform the experiments and discuss the results with the comparison with other similar experiments using available literature. Through oral presentation, students will learn to summarize a discussing the results in a short time.

COMPETENCY ASSESSMENT

Criteria and assessment tools

System (E1):

Presentation of works and activities. It will contribute 70% of the final grade according to the following criteria:

Students must demonstrate that they have been able to plan and implement a BioProcess from raw material to product, modelling the processes required, provable through classroom work, through attendance and participation. The maximum score in this sense will be obtained if students attend working sessions, actively participates and has a dynamic attitude to laboratory work and the processing of data, which will be corrected and tighted up to a **maximum of 4 points**. (NG4, CT1, CB6, CE1, CE2).

To demonstrate the competence of the students for the synthesis and presentation of the obtained results will be an **exhibition using audiovisual media**, obtaining in this way a **maximum rating of up to 3 points**. (CT4,CB6, CE1)

System (E2): **Tests written.** It will provide a 30% of the final grade according to the following criteria:

Written testing could spread along the course in the form of small content tests. It will be awarded up to a **maximum of 3 points**. (CE1, CE2, CT4).

It is not required to achieve a minimum score in any of the preceding paragraphs. All the marks obtained are weighted.

Follow-Up Mechanisms

Class attendance
Access to the virtual classroom
Delivery of activities in class
Delivery of activities in tutorials
Delivery of activities in virtual classroom
Others: Attitude to the work in the laboratory. Proper development and monitoring of experiments outside class hours. Application of the procedures learned in the laboratory.

Functional diversity / Functional disability.

- Those students with disabilities or special educational needs can get in contact with the Delegation of the Rector for the Functional Diversity (http://www.ual.es/discapacidad) to receive the appropriate guidance and advice in order to facilitate their instructional, learning and training processes. Likewise, these students may request the implementation of the necessary and suitable adaptations of content, methodology and evaluation that guarantee equal opportunities in their

academic development. The processing of any personal data or aggregated information regarding these aforementioned students, in fully compliance with the GDPR, is strictly confidential. Faculties and academic staff lecturing the course referenced by this guide/document will be in charge of applying the recommended adaptations approved by the Delegation of the Rector for the Functional Diversity, this fact will be, therefore, notified to the School or Faculty as well as to the coordinator of the academic course.

COURSE MATERIALS

Recommended course materials

Basic

- Atkinson, B.. Biochemical engineering and biotechnology handbook.
- DEMAIN, A.. Manual of Industrial Microbiology and Biotechnology. ASM Press.
- Doran, Pauline m. Bioprocess Engineering Principles. Academic Press. 2007.
- Octave Levenspiel,. The chemical reactor omnibook.

Couse materials available in UAL's library

http://almirez.ual.es/search/x?SEARCH=70801206

WEBSITE

http://eva.ual.es
Access to the virtual platform