



## 1. General information

Course: INMUNOLOGY

Type: CORE COURSE

Degree: 341 - UNDERGRADUATE DEGREE PROGRAMME IN BIOCHEMISTRY

Center: 501 - FACULTY OF ENVIRONMENTAL SCIENCES AND BIOCHEMISTRY

Year: 3

Main language: Spanish

Use of additional  
languages:

Web site:

Code: 13324

ECTS credits: 6

Academic year: 2023-24

Group(s): 40

Duration: C2

Second language: English

English Friendly: Y

Bilingual: N

Lecturer: EMMA BURGOS RAMOS - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Edificio 6 /despacho 11	QUÍMICA INORG., ORG., Y BIOQ.	96813	Emma.Burgos@uclm.es	Monday, tuesday and thursday (11:30-13:30) previous appointment by email.

## 2. Pre-Requisites

Not established

## 3. Justification in the curriculum, relation to other subjects and to the profession

The contents of this subject are framed within the Degree in the third year, as an essential training for the understanding and integration of knowledge that will be taught in other subjects of the Degree, such as Signaling, Control and Cellular Homeostasis (2nd year), Human Physiology (3rd year), Clinical Biochemistry (3rd year), Virology and Parasitology (3rd year).

The formation received in the subject will be essential to achieve a advantageous professional competitiveness. Likewise, it will boost the performance of jobs in public and private companies, dedicated to health biotechnology, agro-food, industrial and business management, both in R & D departments and business management on knowledge, occupational risks, environment and quality.

## 4. Degree competences achieved in this course

## Course competences

Code	Description
E01	Express themselves correctly in basic biological, physical, chemical, mathematical and computer terms.
E02	Work properly and quality driven in a chemical, biological and biochemical laboratory, including safety, handling and disposal of waste and keeping a record of activities.
E20	To know the biochemical and molecular bases of the control of gene expression and the activity, location and replacement of cellular proteins.
E26	Design, execute and interpret the results of basic immunochemical techniques.
E27	Distinguish the components of the immune system, its structure, function and mechanisms of action.
G01	To possess and understand the knowledge in the area of Biochemistry and Molecular Biology at a level that, based on advanced textbooks, also includes cutting-edge aspects of relevance in the discipline
G02	To know how to apply the knowledge of Biochemistry and Molecular Biology to professional practice and to possess the necessary intellectual skills and abilities for this practice, including the capacity for: information management, analysis and synthesis, problem solving, organization and planning and generation of new ideas.
G03	Be able to collect and interpret relevant data, information and results, draw conclusions and issue reasoned reports on relevant social, scientific or ethical issues in connection with advances in Biochemistry and Molecular Biology.
G05	Develop those strategies and learning skills necessary to undertake further studies in the area of Biochemistry and Molecular Biology and other related areas with a high degree of autonomy.
G06	Acquire skills in the handling of computer programs including access to bibliographic, structural or any other type of databases useful in Biochemistry and Molecular Biology.
T01	Proficiency in a second foreign language, preferably English, at level B1 of the Common European Framework of Reference for Languages
T03	A correct oral and written communication
T04	Ethical commitment and professional deontology
T05	Organizational and planning skills
T06	Capacity for design, analysis and synthesis
T08	Ability to work as a team and, where appropriate, exercise leadership functions, encouraging entrepreneurship
T10	Ability to self-learn and to obtain and manage bibliographic information, including Internet resources

## 5. Objectives or Learning Outcomes

## Course learning outcomes

Description

Knowing the genetic basis of biodiversity

Know the basics of therapies based on knowledge of the immune system.

To know the mechanisms of formation of the antigen-antibody complex.

Understand the genetic basis of specific antibody generation.  
 To know the integrated functioning of all the components of the immune system in the human organism.  
 Know the structure and function of the antibodies.  
 Distinguish and differentiate cellular and humoral immunity  
 To know the applications of biotechnology and genetic engineering in the study of the immune system.  
 To understand the molecular alterations that underlie the pathologies of immunological origin.

## 6. Units / Contents

**Unit 1: Introduction to immune system. Definition and concepts.**  
**Unit 2: Immune system cells.**  
**Unit 3: Lymphoid organs and tissues of the immune system.**  
**Unit 4: Cells and mechanisms of the innate immunity.**  
**Unit 5: The complement system (I): classical, alternative, and lectin pathway.**  
**Unit 6: The complement system (II): receptors and regulation.**  
**Unit 7: Antibodies.**  
**Unit 8: Organization and expression of the immunoglobulin genes.**  
**Unit 9: Maturation, activation and differentiation of B cell.**  
**Unit 10: Maturation, activation and differentiation of T cell.**  
**Unit 11: Major histocompatibility complexes (I)**  
**Unit 12: Major histocompatibility complexes (II). Presentation of antigens.**  
**Unit 13: Cytokines and receptors**  
**Unit 14: Immunoassays**  
**Unit 15: Infections and vaccines**  
**Unit 16: Hypersensitivity reactions**  
**Unit 17: Cancer and Immune system**  
**Unit 18: Immunonutrition**  
**Unit 19: Laboratory sessions**

## 7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E01 E20 E26 E27 G01 G02 G05 T01 T03 T04 T05 T06	1.48	37	N	-	Master classes of Immunology
Writing of reports or projects [OFF-SITE]	Cooperative / Collaborative Learning	E01 E26 E27 G01 G02 G03 G05 G06 T01 T03 T04 T05 T08 T10	1.2	30	Y	N	Voluntary presentation of a group's scientific research work related to the different disciplines of Immunology (in groups of 8-10.). The presentation must be recorded in a video and sent to the professor for evaluation. This activity is not recoverable
Final test [ON-SITE]	Assessment tests	E01 E20 E26 E27 G01 G02 T01 T03 T04 T05 T06	0.12	3	Y	Y	The exam will consist of short questions and development questions. It is compulsory to pass the exam with a mark of 4/10 to add the others evaluable activities. The total sum of evaluable activities must be 5 to pass subject. This exam is recoverable in the make-up exam call.
Study and Exam Preparation [OFF-SITE]	Self-study	E01 E20 E26 E27 G01 G02 G03 G05 T01 T03 T04 T05 T06 T10	1.4	35	N	-	Preparation of exam using the recommended textbooks, additional bibliography (papers), and videos.
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	E01 E02 E26 E27 G02 G03 G05 T01 T03 T04 T05 T06 T08 T10	0.72	18	Y	Y	The practices are mandatory and face-to-face, except in justified cases. The realization of practices is not recoverable. Failure to attend practices supposes suspending the subject.
Final test [ON-SITE]	Assessment tests	E01 E02 E26 E27 G02 G03 G05 T01 T03 T04 T05 T06 T08 T10	0.08	2	Y	Y	It is obligatory to present and pass (4/10) the practical exam in order to the others evaluable activities can be counted. The non-presentation of the practical exam in a timely manner will mean that the course can not be passed. In addition, the practical exam is recoverable in the make-up exam call.
Other off-site activity [OFF-SITE]	Self-study	E01 E20 E27 G02 G05 T01 T03 T04 T05 T06 T10	1	25	Y	N	Self-assessment of the blocks of theoretical content proposed by the teacher. This activity is not recoverable
<b>Total:</b>			<b>6</b>	<b>150</b>			
<b>Total credits of in-class work: 2.4</b>			<b>Total class time hours: 60</b>				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

**8. Evaluation criteria and Grading System**

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Final test	65.00%	65.00%	The exam will consist of short questions and development questions. It is compulsory to pass the exam with a mark of 4/10 to add the others evaluable activities. The total sum of evaluable activities must be 5 to pass subject.
Final test	20.00%	20.00%	It is obligatory to present and pass (4/10) the practical exam in order to the others evaluable activities can be counted. The non-presentation of the practical exam in a timely manner will mean that the course can not be passed. In addition, the practical exam is recoverable in the make-up exam call.
Other methods of assessment	7.50%	0.00%	Voluntary written presentation of a scientific research work about Immunology
Self Evaluation and Co-evaluation	7.50%	0.00%	Self-assessment of the blocks of theoretical content proposed by the teacher.
<b>Total:</b>	<b>100.00%</b>	<b>85.00%</b>	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

**Evaluation criteria for the final exam:****Continuous assessment:**

The final exam will consist of short questions and development questions. It is mandatory to pass the exam with a mark of 4/10 to add the others evaluable activities. The total sum of evaluable activities must be 5 to pass subject.

The mode assigned by default to the student will be continuous assessment. Any student may request the change to the non-continuous assessment modality (before the end of the class period) by email to the teacher, provided that the assessable activities have been not evaluated, at least 50% of total evaluation of the subject.

It is essential to present and pass (4/10) the practical exam in order to the others evaluable activities can be counted. The sum of total activities must be of 5 to pass subject.

**Non-continuous evaluation:**

In this type of evaluation, it is mandatory to obtain a minimum 4/10 in both activities so that they can be counted. The total sum of both activities must be a minimum of 5 to pass the subject.

**Specifications for the resit/retake exam:**

The final test will consist of short questions and development questions. It is necessary to pass the test and practical exam with a mark of 4/10 to add the others evaluable activities. The total sum of evaluable activities must be 5 to pass subject.

**Specifications for the second resit / retake exam:**

The final test will consist of short questions and development questions. It is necessary to pass the test and practical exam with a mark of 4/10 to add the others evaluable activities. The total sum of evaluable activities must be 5 to pass subject.

**9. Assignments, course calendar and important dates****Not related to the syllabus/contents**

Hours	hours
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**10. Bibliography and Sources**

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Abbas AK, Lichtman A H, Pillai S.	Molecular and Cellular Immunology. 9th edition.	Elsevier		97803235	2017	Immunology textbook
Murphy K, Travers P, Walport M. Janeway's	Immunobiology. 9ª Edición	Garland Science			2009	Immunology textbook
Owen J.A, Punt J. y Stranford S.A.	Immunology by Kuby. 7th edition	McGraw-Hill		9786071511263	2014	Immunology textbook