BIOTECHNOLOGY FOR HEALTH AND SUSTAINABILITY (2020-21)

Código:	Fecha de aprobación:	Precio:
D040	09/01/2014	39,27 1st registration credits
Créditos:	**Título:**	
60	Master (ECTS)	

RAMA
Sciences

PLAN
UNIVERSITY MASTER'S DEGREE IN BIOTECHNOLOGY FOR HEALTH AND SUSTAINABILITY

TIPO DE ENSEÑANZA
Combined Face-to-face and On line

CENTROS DONDE SE IMPARTE
Faculty of Science

ESTUDIO IMPARTIDO CONJUNTAMENTE CON
Solo se imparte en esta universidad

FECHAS DE EXAMEN
Acceda al listado de fechas de examen para esta titulación.

PLAN DE ESTUDIOS OFERTADO EN EL CURSO 2020-21

Leyenda: No ofertada | Sin docencia

UNIVERSITY MASTER'S DEGREE IN BIOTECHNOLOGY FOR HEALTH AND SUSTAINABILITY

COMPULSORY SUBJECTS — 30 créditos

Curso	Título	Créditos	Subject
1	END OF MASTER WORK	15	36652 - MASTER'S DEGREE FINAL PROJECT
1	COMPULSORY	2	36600 - BIOSCIENCE SEMINARS
1	COMPULSORY	3	36601 - PATENTS, INTELLECTUAL PROPERTY AND BUSINESS DEVELOPMENT AND MANAGEMENT (SPIN-OFF)
1	COMPULSORY	3	36605 - DOCUMENTATION, COMMUNICATION AND DISSEMINATION IN BIOSCIENCE
1	COMPULSORY	3	36607 - EXPERIMENTAL DESIGN IN THE HEALTH SCIENCES AND BIOINFORMATICS
1	COMPULSORY	3	36609 - IMAGE PROCESSING TECHNIQUES AND SIGNAL ANALYSIS IN BIOSCIENCE
1	COMPULSORY	1	36610 - SOCIAL, ETHICAL AND LEGAL CONSIDERATIONS IN BIOMEDICINE AND LIFE TECHNOLOGIES

OPTIONAL SUBJECTS — 30 créditos

OWN OPTIONAL SUBJECTS — 22 créditos

Curso	Título	Créditos	Subject
-	OPTIONAL	3	36628 - INTRODUCTION TO ADVANCED MOLECULAR ANALYSIS AND DIAGNOSTIC TECHNIQUES
-	OPTIONAL	4	36640 - THE CELL FACTORY: ENGINEERING AND PHARMACOGNOSY OF NATURAL BIOACTIVE PRODUCTS
-	OPTIONAL	8	36653 - BIOTECHNOLOGY LABORATORIES
-	OPTIONAL	2	36654 - GENETIC MODIFICATION OF ORGANISMS
-	OPTIONAL	2	36655 - STRUCTURAL AND FUNCTIONAL ANALYSIS OF PROTEINS
-	OPTIONAL	2	36656 - FUNCTIONAL GENOMICS AND PROTEOMICS
-	OPTIONAL	2	36657 - MOLECULAR MARKERS AND THEIR APPLICATIONS IN THE LIFE SCIENCES
-	OPTIONAL	2	36658 - MOLECULAR MICROBIOLOGY
-	OPTIONAL	2	36659 - SIGNALLING AND REGULATION OF GENE EXPRESSION
-	OPTIONAL	2	36660 - PROTEIN ENGINEERING AND MOLECULAR DESIGN
-	OPTIONAL	2	36661 - AGRICULTURAL BIOTECHNOLOGY
-	OPTIONAL	2	36662 - FOOD BIOTECHNOLOGY
-	OPTIONAL	2	36663 - ENVIRONMENTAL BIOTECHNOLOGY

OPTIONAL SUBJECTS OTHER ROUTES — máximo 8 créditos

Curso	Título	Créditos	Subject
-	OPTIONAL	2	36611 - INTRA-AND INTERCELLULAR SIGNALLING
-	OPTIONAL	2	36612 - ADVANCES IN NEUROSCIENCE
-	OPTIONAL	3	36613 - BASIC RESEARCH MODELS IN THE STUDY OF DISEASE: FROM BIOPHYSICS TO THE PATHOLOGY OF
-	OPTIONAL	3	36614 - BASIC RESEARCH MODELS IN THE STUDY OF DISEASE: NEURODEGENERATIVE DISEASES OF THE
-	OPTIONAL	4	36615 - PHARMACEUTICAL PRINCIPLES FOR THE DESIGN OF NEW DRUGS
-	OPTIONAL	3	36617 - HUMAN GENETICS: GENETIC DIAGNOSIS AND ASSISTED REPRODUCTION
-	OPTIONAL	2	36618 - NUTRITION IN HEALTH AND ILLNESS
-	OPTIONAL	2	36619 - STEM CELLS AND REGENERATIVE MEDICINE
-	OPTIONAL	2	36620 - CLINICAL AUDIOLOGY
-	OPTIONAL	1	36621 - EXPERIMENTATION WITH ANIMAL MODELS
-	OPTIONAL	2	36622 - FUNCTIONAL DIAGNOSTIC TECHNIQUES
-	OPTIONAL	2	36623 - ADVANCES IN CELLULAR AND TISSULAR TECHNIQUES
-	OPTIONAL	2	36625 - ADVANCES IN CELL CULTURE
-	OPTIONAL	2	36626 - CLINICAL ANALYSES: BIOCHEMICAL AND MICROBIOLOGICAL
-	OPTIONAL	3	36630 - BIOORGANIC TRANSFORMATIONS
-	OPTIONAL	3	36631 - SYNTHESIS OF ORGANOMETALLIC COMPOUNDS
-	OPTIONAL	2	36633 - ASYMMETRIC SYNTHESIS METHODOLOGIES
-	OPTIONAL	3	36634 - SOLID STATE SYNTHESIS, COMBINATORIAL CHEMISTRY AND BIOLOGICAL ACTIVITY ANALYSIS
-	OPTIONAL	3	36636 - ADVANCED ORGANIC MATERIALS
-	OPTIONAL	3	36638 - BIOORGANIC ANALYSIS USING MASS SPECTROMETRY
-	OPTIONAL	4	36639 - ASYMMETRIC CATALYSIS: ORGANOCATALYSIS AND METAL CATALYSIS
-	OPTIONAL	3	36642 - INDUSTRIAL PHARMACEUTICAL CHEMISTRY
-	OPTIONAL	3	36643 - ADVANCED NUCLEAR MAGNETIC RESONANCE

Superado este bloque se obtiene
MASTER'S DEGREE IN BIOTECHNOLOGY FOR HEALTH AND SUSTAINABILITY

AIMS

The overall objective of this Master's degree course is to train professionals in the field of Biotechnology research, with a broad focus on health and the development of processes and products based living beings which will contribute to improving sustainable use of natural resources.

The Master's Degree aims to provide specialisation, primarily in the acquisition of proficiencies related to research, but also includes the acquisition of advanced knowledge and a command of cutting-edge techniques and skills.

A multidisciplinary focus is taken, facilitating student adaptation to professional settings, which can be extremely dynamic in these fields, and helping them to anticipate in high-level research projects, which increasingly require a greater degree of synergy from different research groups taking different experimental approaches.

Accordingly, the ultimate goal of this Master's is to provide professionals with a solid grounding in molecular and cellular biology, genetic engineering and systems biology, which will allow them on the one hand to develop excellent basic biotechnology research skills, and on the other to promote competitive applied research into health and sustainability, mainly through the use and development of biotechnology. The general objectives are as follows:

1. To provide a deeper understanding of living beings at molecular and cellular level as the basis for discovering and developing new ways to use biological resources in a more rational and sustainable way.

2. To acquire the practical skills and knowledge necessary for biotechnology laboratory work.

3. To acquire knowledge of the most relevant current technologies in biotechnological research, and of their uses and limitations in a health and sustainability context.

4. To acquire the knowledge and ability to identify problems relating to various aspects of health, food and the environment, and to be able to propose lines of biotechnology-based research or actions in the quest for practical, creative and sustainable solutions.

5. To acquire the ability to design and carry out a research project in the field of biotechnology.

6. To develop the ability to communicate and present scientific work clearly and concisely, both verbally and in writing.

7. To acquire the skills necessary for independent life-long learning.

8. To acquire a solid basis for a career in research after taking a doctorate or for carrying out professional duties in the biotechnology field.

MASTER'S DEGREE COURSE - CREDITS AND SUBJECTS

Type of subject	Credits
Compulsory (OB)	15
Optional (MOI) (OP)	22
Elective (MOLE) (OP) (Appendix 1)	8
Final Project (OB)	15
TOTAL CREDITS	**60**

DISTRIBUTION OF SUBJECTS BY YEAR/TERM

SEMESTER 1		SEMESTER 2				
CORE MODULE	MODULE SPECIFIC TO BIOTECHNOLOGY FOR HEALTH AND SUSTAINABILITY		MASTER'S DEGREE FINAL PROJECT	15 CR	22-30 CR	15 CR
PATENTS, INTELLECTUAL PROPERTY AND SPIN OFF COMPANIES (OB, 3 CR)	FUNCTIONAL PROTEOMICS AND GENOMICS (OP, 2 CR)			DOCUMENTATION, COMMUNICATION AND DISSEMINATION IN BIOSCIENCES (OB, 3 CR)	BIOTECHNOLOGY LABORATORY (OP, 8 CR)	THE CELL FACTORY (OP, 4 CR)
INTRODUCTION TO ADVANCED TECHNIQUES (OP, 3 CR)	MOLECULAR MICROBIOLOGY (OP, 2 CR)	IMAGE PROCESSING TECHNIQUES AND SIGNAL ANALYSIS IN BIOSCIENCES (OB, 3 CR)	MOLECULAR MARKERS (OP, 2 CR)			LINES OF INVESTIGATION OF GROUPS OF BIOTECHNOLOGY (OB, 15 CR)
GENETIC MODIFICATION (OP, 2 CR)	SIGNALLING AND REGULATION (OP, 2 CR)		EXPERIMENTAL DESIGN AND BIOCOMPUTING (OB, 3 CR)			
SEMINARS IN THE BIOSCIENCES (OB, 2 CR)	BIOETHICS (OB, 1CR)	PROTEIN ENGINEERING (OP, 2 CR)				
	STRUCTURAL AND FUNCTIONAL ANALYSIS OF PROTEINS (OP, 2 CR)	AGRICULTURAL BIOTECHNOLOGY (OP, 2 CR)				
		FOOD BIOTECHNOLOGY (OP, 2 CR)				
		ENVIRONMENTAL BIOTECHNOLOGY (OP, 2 CR)				
	OPTIONAL MODULE					
	0-8 CR					
	ADVANCES IN NEUROSCIENCE (OP, 2 CR)	INTRA- AND INTERCELLULAR SIGNALLING (OP, 2 CR)				
	RETINAL NEURODEGENERATIVE DISEASE MODELS (OP, 3 CR)	ION CHANNEL DISEASE MODELS (OP, 3 CR)				
	STEM CELLS AND REGENERATIVE	HUMAN GENETICS: GENETIC				

	MEDICINE (OP, 2 CR)	DIAGNOSIS AND ASSISTED REPRODUCTION (OP, 4 CR)		
	ANIMAL MODELS (OP, 2 CR)			
	FUNCTIONAL DIAGNOSTIC TECHNIQUES (OP, 2 CR)	NUTRITION, HEALTH AND ILLNESS (OP, 2 CR)		
	BIOORGANIC TRANSFORMATIONS (OP, 3 CR)	CLINICAL AUDIOLOGY (OP, 2 CR)		
		ADV. CELLULAR AND TISSULAR TECHNIQUES (OP, 2 CR)		
	SYNTHESIS WITH ORGANOMETALLIC COMPOUNDS (OP, 3 CR)	ADVANCED CELL CULTURE (OP, 2 CR)		
	METHODOLOGIES IN ASYMMETRIC SYNTHESIS (OP, 2 CR)	PHARMACOLOGICAL BASES FOR THE DESIGN OF NEW MEDICINES (OP, 4 CR)		
	SOLID STATE SYNTHESIS, COMBINATORIAL CHEMISTRY AND BIOACTIVITY (OP, 3 CR)			
		BIOCHEMICAL AND MICROBIOLOGICAL CLINICAL ANALYSIS (OP, 2 CR)		
	ADVANCED ORGANIC MATERIALS (OP, 3 CR)	BIOORGANIC ANALYSIS WITH MASS SPECTROMETRY (OP, 3 CR)		
	CLINICAL OPTOMETRIC PROCEDURES (OP, 3 CR)			
		ASYMMETRIC CATALYSIS: ORGANOCATALYSIS AND CATALYSIS WITH METALS (OP, 4 CR)		
	ADVANCED VISUAL OPTICS (OP, 6 CR)	INDUSTRIAL PHARMACEUTICAL CHEMISTRY (OP, 3 CR)		
		ADVANCED NUCLEAR MAGNETIC RESONANCE (OP, 3 CR)		
	NEW VISUAL COMPENSATION TECHNIQUES (OP, 6 CR)			
		VISION REHABILITATION (OP, 6 CR)		
		ADVANCED CONTACTOLOGY (OP, 3 CR)		
		CLINICAL STRABISMUS (OP, 3 CR)		
		ADVANCED VISUAL ERGONOMICS (OP, 3 CR)		

GENERAL COURSE PROGRAMME

The Master's in Biotechnology for Health and Sustainability consists of **three modules**: the first, containing the **core subjects**, with 15 credits; the second, offering **specific subjects**, worth 30 credits; and a **final project**, worth 15 credits. The Master's Degree forms part of a common Training Programme (Biomedicine and Life Sciences) (see appendix I), enabling students to take up to 8 optional credits in subjects relating to the knowledge area of other Master's programmes.

The Master's is worth 60 ECTS credits, divided into 15 compulsory ECTS and 30 optional ECTS, of which at least 22 must be from the optional Biotechnology for Health and Sustainability module in order to obtain this specialisation. The remaining credits (15 ECTS) correspond to the Final

Master's Project (FMP).

- The **Compulsory Module** includes subjects with inter-disciplinary content as an introduction to research into the biosciences ("Documenting, communicating and disseminating biosciences (DCDB)", "Patents, intellectual property and business development and management (spin-off) (PIPBM)", "Bioethics: social, ethical and legal aspects (BE)"), as well as other more applied subjects ("Image processing techniques and signal analysis in biosciences (IPTSA)", "Experimental design and bioinformatics (EDB)") and seminars on biosciences (SB), giving students the chance to meet and learn from internationally renowned specialists. The aim of this module is to provide students with the fundamental tools necessary to be able to undertake scientific research tasks successfully.
- The **Specific Subjects** module includes all the subjects in the Biotechnology for Health and Sustainability programme.
- Lastly, the **Final Master's Project** is an independent module where students carry out a research project in which they must use the knowledge that they have acquired to design and develop a brief research project in this specialist area.

APPENDIX I: POSTGRADUATE TRAINING IN BIOMEDICINE AND LIFE SCIENCES

The University Master's Degree in Biotechnology for Health and Sustainability from the University of Alicante is designed to form part of a Postgraduate Training Programme in Biomedicine and Life Technologies co-ordinated by the Faculty of Science. Implementation of this Postgraduate Training Programme in Biomedicine and Life Technologies is based on the need for recent Science and Health Science graduates to extend their knowledge and skills for specialisation in this field and to acquire a preparation that enables them to continue their specific doctorate studies. The postgraduate courses available should observe criteria of quality and sustainability, in accordance with the training, scientific and social objectives of a public institution, and proposals for courses should take into account the resources available in the organising institution, in this case the University of Alicante.

In this context, and in order to make the best possible use the available infrastructures and the multi-disciplinarity offered by the current structure of the University of Alicante Science Faculty, which includes training programmes in Science and Health Science branches, we have brought together the various educational programmes relating to Biomedicine and Life Technologies, comprising four master's degrees which are consistent in structure and interrelated, namely "**Biomedicine**", "**Biotechnology for Health and Sustainability**", and "**Medical Chemistry**" .

The end objective is to provide a broad and attractive gamut of quality courses aimed at a diverse range of students yet who are all interested in the various aspects of biomedicine or life technologies, given the relevance in both scientific and social terms of knowledge in these fields.

ENTRY REQUIREMENTS

According to the Regulations of the University of Alicante, the following requirements must be complied to have access to official taught Master's degrees:

1. To be in possession of a SPANISH OFFICIAL GRADUATE DEGREE CERTIFICATE or other issued by an institution of higher education within the EHEA (European Higher Education) that enables the holder to have access to Master's degrees in the issuing .
2. To be in possession of an officially approved FOREIGN HIGHER EDUCATION DEGREE CERTIFICATE that had been recognised as equal to the degree that allows access to the requested studies.
3. To be in possession of a UNIVERSITY DEGREE CERTIFICATE obtained in a University or Higher Education Institution of COUNTRIES OUTSIDE THE EHEA, without the prior approval of their studies. In this case, the following should be considered:
    - Non- recognised degree certificates shall require a technical report showing an equivalence statement issued by the University of Alicante (ContinUA – Continuing Education Centre), for which the corresponding fee should be paid.
    - Access through this way does under no circumstances imply prior official approval of the holder's degree certificate, nor its recognition for purposes other than studying a master's degree.

ADMISSION AND ASSESSMENT CRITERIA

1.- Applicant profile, admission criteria and other requirements

In the event that the number of applicants exceeds the places available, making it necessary to be selective, or indeed verify any of the student admission requirements, the Master's Academic Commitee will ensure compliance with all regulations pertaining to admission to the Master's Degree course in Biotechnology for Health and Sustainability, without affecting any other admission requirements envisaged, and it will conduct student interviews if deemed necessary.

Distribution of the 20 places offered:

- Main group: 14 places will be reserved for graduates in scientific and technical degrees related to Biology (Biology, Biotechnology, Biochemistry, Medicine, Pharmacy, Veterinary Science and Chemistry, among others), who completed their studies in the five academic years prior to commencement of the Master's Degree.
- The remaining 6 places will be reserved for graduates in the same degrees who do not fulfill the previous requirement. Should any of these 6 places remain vacant, they will be awarded to graduates from the first group.

The admission criteria for the main group will be based on the overall academic grade awarded for the Degree. Where applicants were awarded the same grade, preference will be given to applicants who completed their studies in less time. Where a tie persists, the Master's Academic Committee will reach a decision based on personal interviews with the applicants concerned.

Admission criteria for the remaining places will be based on the applicant's academic record (6 points), research activities (3 points) and previous professional experience (1 point), in accordance with a scale to be approved by the Master's Academic Committee prior to commencement of the pre-enrolment period.

In order to provide students with information in advance of enrolment concerning the admission requirements to the Master's Degree in Biotechnology for Health and Sustainability, the University of Alicante's web page publishes all the necessary information (academic and administrative information, studies, admission, resources, complementary training and services, mobility, etc.)

PRE-ENROLMENT AND ENROLMENT

PRE-ENROLMENT +info

Students who intend to study for an officially recognised Master's Degree at the UA should complete pre-enrolment in accordance with the guidelines and deadlines specified annually.

ENROLMENT +info

Following publication of the final list of those admitted to the course, an email containing a user password will be sent to successful applicants, enabling them to enrol via the **Campus Virtual** in accordance with the guidelines and deadlines specified annually.

In the registration process, the **documents issued abroad** must be official, duly notorised and translated. Further information:

- http://sga.ua.es/en/academic-regulations/legalizacion/legalization-of-documents.html

NUMBER OF PLACES

COURSE	NUMBER OF PLACES
2012-13	20
2013-14	20

2014-15	20
2015-16	20
2016-17	20
2017-18	20
2018-19	20
2019-20	20

FOCUS

Research.

DEGREE COURSE SPECIALISATION PROFILE

The basic profile for this Master's course is an introduction to biotechnology research and its applications in health and sustainability, although the training it provides in biotechnology is also compatible with professional practice.

PROFESSIONAL PROFILES

Professions for which the degree qualifies its holder.

This master's degree course is not aimed at any specific profession.

TIMESCALE FOR IMPLEMENTATION

1. Timescale for implementation of the new Master's Degree Course

Academic year	Implementation of the Master's Degree
2010-2011	1st year

2. Procedure for equivalence recognition, where appropriate, between the current and the new course programme.

The table below details credit equivalence between the Doctorate in Experimental and Applied Biology and the Inter-university Master's in Advanced Optometry and Vision, and the new programme in Biomedicine and Technologies for Life. Thus, students who have taken subjects in the current programmes can join the new course without penalty.

Credit equivalence for the Master's in Advanced Optometry and Vision Sciences

MAOVS	CRED	MOV	ECTS
Clinical decision making	5	Advanced clinical optometry	6
Advanced ophthalmic optics Advanced physiological optics	3 3	Advanced visual optics	6
Advances in visual neuroscience	4	Visual neuroscience	3
Advanced contactology I	2	Advanced contactology	3
Biostatistics in health sciences	4	Statistics in health sciences	3
Vision therapy, orthoptics and pleoptics	4.5	Vision rehabilitation	6
Advances in visual ergonomics	4	Advanced visual ergonomics	3
Clinical strabismus	4	Clinical strabismus	3
Mechanisms and models of colour vision Mechanisms and models of spatial vision Mechanisms and models of movement vision Mechanisms and models of depth vision		Mechanisms and models of vision	3
Imaging techniques for research and diagnosis	4	Imaging techniques for research and diagnosis	6
Advanced optical materials	5	New optical materials	3
Clinical ocular pathology	3	Clinical ocular pathology	3
Scientific documentation	3	Scientific documentation	3
Clinical practices / other subjects		Optional	Up to 9 cred

Credit equivalence for subjects on the Doctorate Programme in Experimental and Applied Biology

EAB	No. cred.	MBT - MBM	ECTS
Biofertilisers and bioplaguicides (63610)	3	Agricultural biotechnology	2
Bioinformatics applied to DNA sequence analysis (62261)	3	Experimental design in Health Sciences and Bioinformatics	3
Stem cells: differentiation and cellular therapy (62247)	3	Stem cells and regenerative medicine	2
Intercellular communication (62262)	3	Intra- and intercellular signalling	2
Molecular microbian ecology (62260)	3	Molecular microbiology	2
Structure and function of extremophilic proteins (62245)	3	Structural and functional analysis of proteins	2

Proteomics (63619)	3	Functional proteomics and genomics	2
Seminars on experimental and applied biology (62199)	3	Advances in biosciences	2
Enzyme engineering (63614)	2.5	Protein engineering and molecular design	2
Methods for the functional study culture cells (62266)	2.5	Advances in cell culture	2
Nucleic acid analysis techniques (62203)	2.5	Introduction to advanced molecular analysis and diagnosis techniques	2
Immunocytochemistry techniques, confocal microscopy and western blotting (62200)	2.5	Advances in cellular and tissular techniques	2

3. Studies being phased out and replaced by the proposed degree course:

Training Programme for the Doctorate in Experimental and Applied Biology.

- Verified Report
- Resolution from the Universities Council: Positive verification
- Resolution from the Universities Council: Accreditation renewal
- Authorization from the Valencian Government

Internal Quality Assurance System (SGIC) of the Title

- Structure of the Centre for Quality
  - Comission of Internal Quality Guarantee
  - Other Commissions
- Handbook SGIC
- Procedures
  - Strategic (PE)
  - Key (PC)
  - Support (PA)
  - Measurement (PM)
- Management of the SGIC (Access to ASTUA)

Follow-up of the Title

- Self-reports UA
- External reports AVAP
- Other reports
- Improvement Plans
- Progress and Learning Outcomes

Information about the Centre	General information for students
• **Faculty of Sciencies** Campus de San Vicente del Raspeig Ctra. de Alicante s/n 03690 San Vicente del Raspeig (Alicante) Telephone:+ 34 96 590 3557 Fax:+ 34 96 590 3781 facu.ciencies@ua.es http://ciencias.ua.es/en/ • **Life Long Learning Centre (ContinUA)** **Only for pre-enrolment formalities** Germán Bernácer Building. Ground Floor Telephone: + 34 96 590 9422 Fax: + 34 96 590 9442 continua@ua.es https://web.ua.es/en/continua/	• Grants and assistance • Accommodation • Student refectories and cafeterias • Transport • Emergency medical care • Insurance • Services for students with special needs • Student representation and participation • University student identity card (TIU) • Frequently asked questions
UA: General Regulations	**+ Information about qualifications**
• Academic regulations and procedures of the University of Alicante	• Official State Gazette (BOE) on publication of course programmes Error Correction • Own Web • Information pamphlet • Details title on the RUCT