

DEGREE IN PHYSICS (2018-19)

Código: C057	Fecha de aprobación: 20/03/2017	Precio: 16,41 1st-registration credits
Créditos: 240	Título: Undergraduate 3-5 years (ECTS)	

RAMA
Sciences

PLAN
DEGREE IN PHYSICS

TIPO DE ENSEÑANZA
Face-to-face

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 2018-19

Leyenda: No ofertada Sin docencia

FIRST YEAR

CORE SUBJECTS				54 créditos
Curso	Título	Créditos	Subject	
1	CORE	6	26200 - PHYSICS I	
1	CORE	6	26201 - PHYSICS II	
1	CORE	6	26203 - ANALYSIS OF A REAL VARIABLE I	
1	CORE	6	26204 - ANALYSIS OF A REAL VARIABLE II	
1	CORE	6	26205 - LINEAL ALGEBRA I	
1	CORE	6	26206 - CHEMISTRY	
1	CORE	6	26217 - FUNDAMENTS OF PROGRAMMING	
1	CORE	6	26218 - INTRODUCTION TO THE MATHEMATICAL LANGUAGE AND TO THE EXPERIMENTATION IN PHYSICS	
1	CORE	6	26219 - NUMERICAL METHODS AND COMPUTER	
COMPULSORY SUBJECTS				6 créditos
Curso	Título	Créditos	Subject	
1	COMPULSORY	6	26225 - LINEAR ALGEBRA II	

SECOND YEAR

CORE SUBJECTS				6 créditos
Curso	Título	Créditos	Subject	
2	CORE	6	26202 - THERMODYNAMICS	
COMPULSORY SUBJECTS				54 créditos
Curso	Título	Créditos	Subject	
2	COMPULSORY	6	26220 - REAL ANALYSIS OF DIFFERENT VARIABLES I	
2	COMPULSORY	6	26221 - REAL ANALYSIS OF DIFFERENT VARIABLES II	
2	COMPULSORY	6	26222 - ANALYTICAL METHODS FOR EDO	
2	COMPULSORY	6	26223 - FUNCTIONAL ANALYSIS	
2	COMPULSORY	6	26226 - LINEAL GEOMETRY	
2	COMPULSORY	6	26227 - CLASSIC MECHANICS I	
2	COMPULSORY	6	26228 - CLASSIC MECHANICS II	
2	COMPULSORY	6	26232 - ELECTROMAGNETISM I	
2	COMPULSORY	6	26240 - EXPERIMENTAL TECHNIQUES I	

THIRD YEAR

COMPULSORY SUBJECTS				60 créditos
Curso	Título	Créditos	Subject	
3	COMPULSORY	6	26224 - ANALYSIS OF COMPLEX VARIABLE	
3	COMPULSORY	6	26229 - QUANTUM MECHANICS I	
3	COMPULSORY	6	26230 - QUANTUM MECHANICS II	
3	COMPULSORY	6	26231 - STATISTICAL MECHANICS	
3	COMPULSORY	6	26233 - ELECTROMAGNETISM II	
3	COMPULSORY	6	26234 - OPTICS I	
3	COMPULSORY	6	26235 - OPTICS II	
3	COMPULSORY	6	26238 - FUNDAMENTALS OF ASTROPHYSICS	
3	COMPULSORY	6	26241 - EXPERIMENTAL TECHNIQUES II	
3	COMPULSORY	6	26242 - EXPERIMENTAL TECHNIQUES III	

FOURTH YEAR

COMPULSORY SUBJECTS				30 créditos
Curso	Título	Créditos	Subject	
4	COMPULSORY	6	26236 - STRUCTURE OF MATTER	
4	COMPULSORY	6	26237 - PHYSICS OF THE SOLID STATE	
4	COMPULSORY	6	26239 - RELATIVITY AND COSMOLOGY	
4	COMPULSORY	6	26243 - EXPERIMENTAL TECHNIQUES IV	
4	COMPULSORY	6	26244 - COMPUTATIONAL PHYSICS	
OPTIONAL SUBJECTS				24 créditos

Curso	Título	Créditos	Subject
4	OPTIONAL	6	26207 - VIBROACOUSTICS
4	OPTIONAL	6	26208 - STELLAR ASTROPHYSICS
4	OPTIONAL	6	26209 - MATERIAL SCIENCE
4	OPTIONAL	6	26210 - DYNAMIC CONTINUOUS MEANS
4	OPTIONAL	6	26211 - QUANTUM PHYSICS ADVANCED QUANTUM ADVANCED PHYSICS ADVANCED QUANTUM PHYSICS
4	OPTIONAL	6	26212 - MEDICAL PHYSICS
4	OPTIONAL	6	26213 - PHOTONICS
4	OPTIONAL	6	26214 - COMPUTATIONAL CHEMISTRY
4	OPTIONAL	6	26215 - EXTERNAL PRACTICES

FINAL PROJECT

6 créditos

Curso	Título	Créditos	Subject
4	END OF DEGREE WORK	6	26216 - FINAL PROJECT

LANGUAGE

Superado este bloque se obtiene

DEGREE IN PHYSICS

- [Credit structure of the degree course](#)
- [Distribution of credits per subject type](#)
- [General description of the course programme](#)

CREDIT STRUCTURE OF THE DEGREE COURSE

The University of Alicante Physics Degree course programme is worth a total of 240 credits, distributed over four years each worth 60 ECTS credits. In turn, each year is organised into 30-credit semesters. The 240 credits cover all the theoretical and practical learning to be acquired by students.

In order to make the course compatible with other activities, students are allowed to take a part-time course consisting of 30 credits per academic year.

DISTRIBUTION OF CREDITS PER SUBJECT TYPE

Subject type	Credits
Core	60
Compulsory	150
Optional	24
Final Project	6
Total credits	240

GENERAL DESCRIPTION OF THE COURSE PROGRAMME

The Course Programme is structured into three modules (Basic, Core and Advanced).

The Basic Module includes nine subjects of the first year and one subject of the second, with a total of 60 ECTS credits of which 42 belong to the basic subjects of the area of Sciences (BR), and consists of the disciplines: Mathematics, Physics and Chemistry.

Moreover, a subject from the Computing disciplines of the Engineering and Architecture area (Foundations of Programming) and further two cross-disciplinary subjects (Introduction to Mathematical Language and Experimentation in Physics, and Numerical Methods and Computation) are included. These are aimed at the acquisition of basic cross-disciplinary skills related with Physics (practical laboratory skills, information and IT skills and mathematical skills), as well as other cross-disciplinary abilities such as oral and written communication, reading English documents (priority proficiencies at University of Alicante) and teamwork.

The Basic Module is taken in the first year (semesters 1 and 2) except the subject Thermodynamics which is taught in semester 3.

The Core Module is compulsory and is taught over the second and third years (semesters 3, 4, 5 and 6) and the first semester of the fourth (semester 7).

The Advanced Module consists of optional subjects (48 ECTS) and offers 8 subjects of 6 credits each that are to be taken in the eighth semester, and the possibility of work experience which is also optional and equals a 6 credits subject under the name "Prácticas Externas" (Work Experience) and is suitable to be taken over the first or the second semester of the fourth year. The student has to choose a total of 4 subjects from the nine offered.

These optional subjects are: Structural Acoustics; Stellar Astrophysics; Materials Science; Dynamics of Continuous Media; Advanced Quantum Physics; Medical Physics; Photonics; Computational Chemistry and Work Experience.

Additionally, the inclusion of activities and materials in English is considered as part of the comprehensive training in accordance with the Plan for the Advancement of English in the Curricula, in order to make it possible for students to acquire fluency and expression skills in a foreign language (English). Moreover, the University of Alicante will offer courses in Basic and Scientific English, avoiding overlap with the lessons schedule of the students, to facilitate for them the acquisition of the B1 level in English which will be compulsory for the evaluation of the Final Project.

The management of the External Practicum (Work Experience) in the Faculty of Sciences is in charge of the OPEMIL. The companies involved provide highly qualified tutors for the required tasks. The type of activity that the student will carry out is to be previously described in a

document designed to such effect that will be reviewed by both the academic tutor and the tutor of the company or institution, as well as by the Faculty official in charge of the supervision of the Work Experience Programme. In this description, the availability of resources in the company for the development of the tasks of the proposed activity will have to be granted.

The student will also have to be granted the possibility to obtain academic recognition, for a maximum of 6 optional ECTS credits from the total of the Course Programme, through participation in diverse activities of the University of Alicante: cultural, sportive, solidarity, cooperation or as a students' representative. Before the beginning of the academic year, the Governing Council will determine which activities will have this academic recognition (<http://www.boua.ua.es/pdf.asp?pdf=2490.pdf>).

Finally, the Advanced Module includes also, as a compulsory subject, the Final Project, that constitutes the final phase of the Course Programme and is worth a total of 6 ECTS credits. In the Final Project the student will have to show the acquisition of the skills associated to the Degree by means of the completion, presentation and defense of a memory presenting original work by the student related with the Physics which may include experimental, computational or theoretical features.

LANGUAGE REQUIREMENT (IN A FOREIGN LANGUAGE)

Students who study an **undergraduate degree** at the University of Alicante must **confirm** a minimum **level of B1 in a foreign language** (a B2 is recommended) in order to **obtain the diploma**.

The required language level is in accordance with the Common European Framework of Reference for Languages.

The language accreditation requirement can be obtained previously or at any time during university studies. However, the language requirement will be necessary in order to be able to **assess the final year project**.

The **different forms** of obtaining such language requirement can be consulted in the additional information in this section.

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LANGUAGE TEACHING COMPETENCE CERTIFICATE

Students who want to have a career in non-university **teaching** when they finish their studies are **recommended** to obtain the **teaching competence certificate** (Valencian and/or foreign languages).

This certificate can be obtained by taking specific itineraries in your university studies or by taking the **UA teaching competence course in Valencian, German, French and English**.

[+info](#)

FINAL YEAR PROJECT (TFG)

All the official undergraduate degrees must be completed by preparing and defending a final year project, which must be done in the final phase of the studies and be aimed at the assessment of competences associated to the degree.

The final year project must be an original, independent and personal work. The elaboration of it may be individual or coordinated. Each student will prepare this project under the supervision of a tutor, allowing students to show the received training content in an integrated way, as well as the acquired competences associated to the undergraduate degree.

In order to **register in the final year project**, students must comply with the requirements established in the "Regulations for continuation studies for students registered in undergraduate degrees at the University of Alicante". Among the requirements established to be able to register in the final year project, a minimum of 168 credits must be passed in undergraduate degrees with a total of 240 credits, and a minimum of 228 credits in undergraduate degrees with a total of 300 credits or more.

In order for **the final year project to be assessed**, a B1 level of a foreign language (B2 is recommended) must be confirmed.

[+info](#)

- [Access routes](#)
- [Procedure for applying for admission](#)
- [Recommended applicant profile](#)
- [Number of places and pass marks](#)

ACCESS ROUTES

Admission to this degree course is open to any applicant who meets one of the following entrance requirements:

1. **SPANISH BACCALAUREATE (LOMCE) UNIVERSITY ENTRANCE EXAM (PAU):** Although students can access university by means of any Baccalaureate specialization, the recommended one is **Sciences**.

ADMISSION SCORES FOR THIS DEGREE CAN BE IMPROVED BY TAKING THE SPECIFIC MODULES OF THE UNIVERSITY ENTRANCE EXAM (PAU) AS INDICATED IN THE TABLE BELOW WITH THEIR RESPECTIVE WEIGHTINGS.

TABLE 1

MODULE WEIGHTINGS		PERFORMING ARTS	BIOLOGY	AUDIO VISUAL CULTURE I	TECHNICAL DRAWING II	DESIGN	BUSINESS ECONOMICS	PHYSICS	FUNDAMENTALS OF ART II	GEOGRAPHY	GEOLOGY	GREEK II	HISTORY OF PHILOSOPHY	HISTORY OF ART	LATIN II	MATHEMATICS APPLIED TO SOCIAL SCIENCES II	MATHEMATICS II	CHEMISTRY
Academic year 2017/18	0,1		X								X							X
	0,2							X									X	

2. **PREVIOUS BACCALAUREATES WITH OR WITHOUT A PASS IN THE UNIVERSITY ENTRANCE EXAM (PAU):** Students who have completed their Baccalaureate under previous education systems and have passed the PAU will be able to use the mark obtained in their application.

HOWEVER, STUDENTS CAN TAKE SPECIFIC EXAM MODULES DURING THE VOLUNTARY PAU EXAM PERIOD IN ORDER TO IMPROVE THEIR ADMISSION SCORE AS SHOWN IN TABLE 1. THEY CAN ALSO SIT FOR THE OBLIGATORY PAU EXAMS, IN WHICH CASE THEY WILL HAVE TO TAKE ALL THE EXAMS SCHEDULED DURING THIS PERIOD.

3. **VOCATIONAL EDUCATION:** Vocational educational qualifications such as senior technician, senior technician of plastic arts and design, or senior technician in sports is the preferred professional area although access to this degree may be through any professional field.

ADMISSION SCORES CAN BE IMPROVED BY TAKING THE PAU EXAM IN UP TO 4 OF THE MODULES IN TABLE 1.

4. **STUDENTS FROM EDUCATION SYSTEMS IN COUNTRIES OF THE EUROPEAN UNION OR OTHER STATES WITH WHICH SPAIN HAS AN INTERNATIONAL AGREEMENT:** Accreditation is required and issued by *Universidad Nacional de Educación a Distancia (UNED)*.

STUDENTS CAN SIT FOR EXAMS IN SUBJECTS INCLUDED IN THE PRUEBAS DE COMPETENCIAS ESPECÍFICAS (PCE), ORGANISED BY THE UNED, IN ORDER TO IMPROVE THEIR ADMISSION SCORE UP TO 14 POINTS AS INDICATED IN THE WEIGHTINGS IN TABLE 1.

5. **STUDENTS FROM FOREIGN EDUCATION SYSTEMS:** Prior to applying for the validation of their foreign Baccalaureate, students may sit for up to 4 exams in subjects offered by the *Pruebas de Competencias Específicas (PCE)* organised by **UNED** (at least one subject from the core subjects).

THE WEIGHTINGS INDICATED IN TABLE 1 WILL BE APPLIED TO CORE AND/OR OPTIONAL SUBJECTS.

6. **OTHER:** University degrees and other similar qualifications. University entrance exam for students over 25 (preferential option: **Sciences**). Access on the basis of professional experience (applicants over 40 years of age). Access to applicants aged 45 years or more by means of an exam.

Weightings of the subjects of the specific phase of the Proof of Access to the University (PAU) in the previous year

High School Diploma Subjects	Weighting parameters	Music Analysis II	Biology	Earth and Environmental Sciences	Drawing II	Technical Drawing II	Design	Business Economics	Electronics	Physics	Geography	Greek II	History of Music and Dance	Art History	Latin II	Musical Language and Practice	World Literature	Mathematics Applied to the Social Sciences II	Mathematics II	Chemistry	Expressive techniques in the Arts and Crafts	Industrial Technology II	
Academic Year 2016-17	0.1		x	x					x												x		x
	0.2									x									x				

PROCEDURE FOR APPLYING FOR ADMISSION: PRE-ENROLMENT AND REGISTRATION

- Anticipated number of places offered during the first pre-enrolment session: 50
- In order to apply for a place, the procedure and pre-enrolment periods established each year must be observed. [Information concerning the application procedure \(Pre-enrolment\)](#).
- Applicants admitted to a course must formally register within the timescale established annually in the enrolment calendar. Registration [Information](#).

RECOMMENDED APPLICANT PROFILE

It is recommended that students who wish to study for a degree in Physics have a basic scientific-technical education, and should have studied, at least, the subjects Mathematics II, Physics and Chemistry in their second year of the high school diploma course.

Among the qualities the future Physics student should possess, the following are of especial relevance:

- Capacity for work (perseverance, method and rigour).
- Capacity for reasoning and critical analysis.
- Scientific spirit.
- Capacity to obtain, interpret and apply knowledge.
- Problem-solving skills.
- Capacity for synthesis and abstraction.
- Recommended complementary education: English and user-level computing skills.

NUMBER OF PLACES AND PASS MARKS

YEARS	NUMBER OF PLACES	PASS MARKS						
		GENERAL	OVER 25	OVER 40	OVER 45	GRADUATES	SPORTSPEOPLE	DISABLED
2016-17	50	---	6,290	---	---	7,400	---	5,000
2017-18	50	11,636	5,000	---	---	5,000	---	---

- "Pass marks" indicated correspond to the results of the first adjudication of June.
- The definitive marks can be inferior to the here collected.

PROFESSIONAL PROFILES

The Physics degree enables for multiple professional profiles such as:

- Physics Education in both its scientific and technical features and issues related to them.
- Scientific and technical advice on issues related to Physics.
- Research and development in Physical Science and Technologies: In its own areas (Astrophysics, Materials Science, Nanotechnology, Nuclear and Particle Physics, Optics, etc.) and in cross-disciplinary areas: Modelling of biological problems and others.
- Environmental questions. Technical studies and projects on air, acoustic and environmental pollution and energy and material waste. Environmental impact assessment. Development of environmental management systems.
- Energy production: Development and management of thermal and nuclear power plants and also wind, thermal solar, photovoltaic solar and other renewable energies power infrastructures.
- Radiation safety issues.
- Information technologies. Programming, design and management of computer and telecommunications systems. Process control systems for diverse purposes.
- Space and aviation technologies. Telemetry and remote sensing studies. Geographic information systems. Design of satellite communication systems.
- Development of arm and defence systems.
- Meteorology and climatology.
- Design and production of scientific and technical instrumentation.
- Design, organization and management of testing and calibration laboratories. Metrological studies in all areas.
- Geodetics and prospecting. Planning geological exploration and prospecting. Seismological studies.
- Medical physics. Implementing of the tasks assigned by the current legislation to the new figure of the Hospital radiophysicist.
- Design and planning of high, medium and low voltage electrical installations. Heating, air conditioning and A.C.S.; fluid (water, gas and other fuels); and telecommunications installations.
- Every activity that relates to Physics.

Professions for which this degree qualifies its holder:

Physicist is not a regulated profession. As stated in its White Paper, this degree enables to:

- University teaching and/or research.
- Non-University teaching and/or research.
- Public administration.
- Banking, finance and insurance companies.
- Consulting firms.
- Computer and telecommunications companies.
- Industry.

DEGREE IN PHYSICS. SYLLABUS SUMMARY

ESTRUCTURA DEL PLAN DE ESTUDIOS POR TIPO DE MATERIA

TIPO DE MATERIA	CRÉDITOS
Formación básica (FB)	60
Obligatorias (OB)	150
Optativas incluidas	24
Prácticas Externas (OP)	6
Trabajo Fin de Grado	6
Total créditos	240

DISTRIBUCIÓN POR CURSOS

PRIMER CURSO		SEGUNDO CURSO		TERCER CURSO		CUARTO CURSO	
Semestre 1	Semestre 2	Semestre 3	Semestre 4	Semestre 5	Semestre 6	Semestre 7	Semestre 8
Física I 6 ECTS	Física II 6 ECTS	Termodinámica 6 ECTS	Electromagnetismo I 6 ECTS	Mecánica Estadística 6 ECTS	Electromagnetismo II 6 ECTS	Estructura de la Materia 6 ECTS	Trabajo Fin de Grado ⁽¹⁾ 6 ECTS
Álgebra Lineal I 6 ECTS	Análisis de una Variable Real II 6 ECTS	Mecánica Clásica I 6 ECTS	Mecánica Clásica II 6 ECTS	Óptica I 6 ECTS	Óptica II 6 ECTS	Física del Estado Sólido 6 ECTS	Optatividad ⁽²⁾ 24 ECTS
Análisis de una Variable Real I 6 ECTS	Métodos Numéricos y Computación 6 ECTS	Análisis Real de Varias Variables I 6 ECTS	Técnicas Experimentales I 6 ECTS	Técnicas Experimentales II 6 ECTS	Técnicas Experimentales III 6 ECTS	Técnicas Experimentales IV 6 ECTS	
Introducción al Lenguaje Matemático y Experimentación en Física 6 ECTS	Química 6 ECTS	Métodos Analíticos para EDO 6 ECTS	Análisis Funcional 6 ECTS	Mecánica Cuántica I 6 ECTS	Mecánica Cuántica II 6 ECTS	Física Computacional 6 ECTS	
Fundamentos de Programación 6 ECTS	Álgebra Lineal II 6 ECTS	Geometría Lineal 6 ECTS	Análisis Real de Varias Variables II 6 ECTS	Análisis de Variable Compleja 6 ECTS	Fundamentos de Astrofísica 6 ECTS	Relatividad y Cosmología 6 ECTS	

⁽¹⁾ Previamente a la evaluación del Trabajo Fin de Grado el alumno debe acreditar el nivel B1 de inglés de acuerdo con la Normativa establecida en la UA.

⁽²⁾ **Optatividad:** El alumnado debe elegir un total de 4 asignaturas de entre las ofertadas.

ASIGNATURAS OPTATIVAS	
Vibroacústica	6 ECTS
Astrofísica Estelar	6 ECTS
Ciencia de Materiales	6 ECTS
Dinámica de Medios Continuos	6 ECTS
Física Cuántica Avanzada	6 ECTS
Física Médica	6 ECTS
Fotónica	6 ECTS
Química Computacional	6 ECTS
Prácticas Externas	6 ECTS

- [Verified Report](#)
- [Resolution from the Universities Council: Positive verification](#)
- [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
<ul style="list-style-type: none"> • Faculty of Sciences Telephone:+ 34 96 590 3557 Fax:+ 34 96 590 3781 facu.ciencias@ua.es http://ciencias.ua.es/en/ • Mobility Programmes • Work experience with companies and institutions • Reception and welcome events • Tutorial Action Programme 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Academic regulations and procedures of the University of Alicante 	<ul style="list-style-type: none"> • Official State Gazette (BOE) on publication of course programmes • Own Web • Information pamphlet • Video presentation of the degree