Universidad Rey Juan Carlos

TEACHING GUIDE

EXTERNAL PRACTICES 1 (HOSPITALS AND HEALTH)

GRADO EN INGENIERÍA BIOMÉDICA (INGLÉS) (3º y 4º curso) (2374)

ACADEMIC YEAR 2026-27

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I.-Subject Identification	
Type	OBLIGATORIA
Teaching period	4 course, annual
Nº of credits	9
Language in wich the subject is taught	English

II.-Presentation

Las rotaciones realizadas durante las prácticas en hospitales buscan proporcionar al estudiante del Grado en Ingeniería Biomédica una visión del ámbito hospitalario, desde el punto de vista de la utilidad y utilización de las distintas tecnologías actualmente relacionadas con los ámbitos de conocimiento cubiertos por la formación en los distintos cursos del grado. También posibilitan el desarrollo de las competencias para integrarse en un área hospitalaria, impulsar la identificación de necesidades abordables desde el ámbito multidisciplinar del grado y realizar una descripción de la necesidad y de las posibles soluciones a abordar. Por tanto, las tecnologías que se pueden explorar comprenden tecnologías de la información y comunicaciones; informática y programación; bases de datos; electrónica; análisis de datos, de señales médicas y de imágenes médicas; estándares e interoperabilidad; biomecánica y biomateriales; genómica y proteómica; estadística y optimización; y, en definitiva, todas aquéllas que se identifiquen por parte del alumnado y el profesorado como relacionados con la ingeniería biomédica dentro de cada área médica.

El objetivo, pues, de esta asignatura, es triple:

1. Proporcionar al (a la) estudiante una panorámica de un número suficiente de diferentes áreas hospitalarias. Facilitar a la (al) estudiante el desarrollo de una visión activa y fundamentada sobre las necesidades y uso de las diferentes tecnologías presentes en cada una de dichas áreas.
2. Impulsar la identificación de problemas específicos abordables a través de las competencias desarrolladas en el Grado en Ingeniería Biomédica, y la elaboración de proyectos multidisciplinares orientados a su resolución.
3. Impulsar la identificación de problemas específicos abordables a través de las competencias desarrolladas en el Grado en Ingeniería Biomédica, y la elaboración de proyectos multidisciplinares orientados a su resolución.

III.-Learning outcomes

CG01 . Analyze and synthesize problems related to biomedical engineering, solve them and communicate them efficiently.
CG07. Work in a multidisciplinary group of engineers and biomedical scientists.
CE01 . Understand or acquire the principles of bioelectrical fundamentals, anatomy, physiology or pathophysiology needed to identify the most appropriate processing technologies for a given problem in biomedical engineering
CE21 . Extract biomedical data from its environment, including knowledge of medical consultation systems, and information standards in medical equipment.

- Key for degrees not adapted to RD 822/21: **CB** - basic competences, **CG** - generic competences, **CE** - specific competences, **CT** - transversal competences.
- Key for degrees adapted to RD 822/21: **CON** - knowledge, **COM** - competences, **HAB** - skills.

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IV.-Contents

IV.A.-Syllabus

The external practices 1 (Clinical practice) are carried out in two sections:

- **Basic Clinical Practice in Biomedical Engineerin**g. In the internships for each service or unit, the clinical and technical staff of the service provide students with the necessary training to understand the equipment, technology, and information available in that service.
- **Specialized Clinical Practices in Biomedical Engineering.** The second phase of the clinical practice will consist of a specialized rotation, i.e., each student will develop a project in one of the areas they have visited. Its objective will be to define and carry out a project in one of the medical areas visited, which identifies a need that can be addressed from any of the knowledge subjects studied in the degree. The work methodology will be established by the teaching staff of the clinical practice and by the medical areas. This methodology will include interaction with the clinical staff, both for the definition of the problem to be solved and for the clinical evaluation of the results obtained, and with the hospital technical staff (service in question, information systems) to identify the sources of information available, when applicable.

A clear deliverable shall be defined to be evaluated at the end of the clinical practice, which may be, for example:

- A report including the results obtained after data analysis, signals or medical images; a study of need; or a feasibility study, among others.
- A prototype of code of some kind (toolbox, application, analysis tool; others).
- An electronic prototype.
- Any other that allows its evaluation as a contribution of biomedical engineering to the health system.

IV.B.-Training activities

Type	Title
Clínicos	Clinical practice
Other activities	Seminars

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V.-Student workload	
Theoretical sessions	0
Resolution of exercises, problems, case studies, etc.	0
Practical sessions in experimental, technological and clinical laboratories, fieldwork, etc.	230
Tests and/or exams	0
Academic tutorials	2
Related activities: conferences, seminars, etc.	0
Preparation of theoretical sessions and self-study	13
Preparation of practical tasks, exercises, case studies, projects, etc.	25
Preparation for tests and/or exams	0
Total student workload	270

VI.-Methodology and academic programme		
Type	**Period**	**Content**
Week 1 to Week 15	Seminarios de orientación de las rotaciones básicas	Week 1 to Week 15

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VII.-Assessment methods

The general assessment method is continuous as established in the *Regulation for the Assessment of Learning Outcomes* of Rey Juan Carlos University.
All the assessment systems established in the degree report must be employed, except for those that have a minimum weight of 0%, which can be used by professors in the academic years they consider relevant. Each assessment system may be applied through one or more assessment activities, consistent with the system. No assessment activity can exceed individually 60% of the overall grade for the subject.
The sum of non re-evaluable activities cannot exceed 40% of the overall grade for the subject and, in general, should not have an established minimum grade (except for practical activities in which, strictly speaking, the conditions of the ordinary call cannot be reproduced in the extraordinary call).
Those students who do not manage to pass the subject in the ordinary call, or do not attend this first call, may attend the extraordinary call only for failed re-evaluable assessment activities.
The distribution and characteristics of the assessment activities are described below.

VII.A.-Description and weight of the assessment activities

In the evaluation of Exteran Practices I (Clinical Practices), the following items will be considered:
- General aspects. Assiduity and punctuality in attending the service will be assessed, as well as the interest shown by the student during the internship.
- Interpersonal communication. Effective and clear communication with health professionals will be assessed.

- **Clinical/technical skills**. The acquisition of clinical and technical knowledge will be assessed. The evaluation will be made using the following system:
- Attendance to rotations in different medical areas/services: 5 %.
- Test with questions related to the concepts shown in the areas visited during the basic clinical practice: 30%.
- **Assessment of a report and a presentation of the work carried out in the specialized clinical practice**: 65%.

Attendance is mandatory. Up to a maximum of 20% absence will be accepted, provided that it is duly justified and as determined by the teacher in charge. If the number of absences exceeds 20%, they must be made up at another time of the year (evenings, weekends, holidays) after agreeing with those responsible for the subject and the clinical staff in charge of the clinical practice. If the rotation cannot be completed before the end of the course, due to good reasons (e.g., illness), if the teacher/tutor agrees, it can be rotated during the summer

VII.B. Assessment of students with academic exemption from class attendance

Having Academic Exemption from Class Attendance (DAAC) does not imply that students are automatically exempt from participating in the continuous assessment activities or in the training activities of compulsory attendance as established in the teaching guide. Once the exemption has been granted, students must contact the subject's teaching staff, who will propose the adaptations he/she may consider relevant, as long as they guarantee the acquisition and adequate assessment of the learning goals established. Students must maintain adequate communication with the teaching staff so that they may provide information on the dates for training and assessment activities, if these are not established in the programme and available for students at the time of achieving the exemption.
Subject with possibility of academic exemption: No.

VII.C. Review of assessment activities

In accordance with the Regulation for the Assessment of Learning Outcomes of Rey Juan Carlos University.

VII.D.-Students with a disability or special educational needs

In order to guarantee equal opportunities, non-discrimination, universal accessibility and academic success, students with disabilities or especial education needs may request curricular adaptations to follow their studies. These adaptations will be provided by the Unit of Attention to People with Disabilities of Rey Juan Carlos University, in accordance with the regulation which regulates the service for the Attention of People with Disabilities at the University. This Unit will issue a report for curricular adaptations, so that students with disabilities or special education needs must contact the service (at e-mail discapacidad.programa@urjc.es) in order to provide relevant information for different educational alternatives.

VII.E.-Academic behaviour, academic integrity and honesty

Rey Juan Carlos University is fully committed to the highest standards of academic integrity and honesty, so studying at the URJC means assuming and subscribing to the values of integrity and academic honesty set out in the University's Ethical Code. To support this process, the University has Rey Juan Carlos University's Academic Conduct Regulation as well as different tools (anti-plagiarism, supervision...) that offer a collective guarantee for the full development of these essential values.

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VIII.-Teaching resources and materials
Basic bibliography
Those indicated as supportive material on each clinical practice
Consultation bibliography

IX.-Professors	
Name and surname	ANA MARÍA DE PABLO HERMIDA
E-mail address	anamaria.depablo@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	ÁNGELA SANTANA VALENCIANO
E-mail address	@urjc.es
Campus	Fuenlabrada
Category	Professional
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	CÉSAR AUGUSTO HENRÍQUEZ CAMACHO
E-mail address	cesar.henriquez@urjc.es

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Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	1
No. of positive evaluations by Docentia	1
Name and surname	CRISTIAN DAVID CHUSHIG MUZO
E-mail address	david.chushig@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Profesor/a Ayudante Doctor/a
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	1
No. of positive evaluations by Docentia	0
Name and surname	CRISTINA SOGUERO RUÍZ
E-mail address	cristina.soguero@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Catedrático/a de Universidad
Academic degree	Doctor

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Person responsible for the subject	Yes
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	2
Number of sexennia	2
No. of positive evaluations by Docentia	3
Name and surname	DANIEL LÓPEZ WOLF
E-mail address	daniel.lopez.wolf@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	DAVID BERNAL BELLO
E-mail address	david.bernal@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0

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No. of positive evaluations by Docentia	0
Name and surname	FRANCISCO JOSÉ VALVERDE ALBACETE
E-mail address	francisco.valverde@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Titular de Universidad
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	3
Number of sexennia	3
No. of positive evaluations by Docentia	1
Name and surname	FRANCISCO MANUEL MELGAREJO MESEGUER
E-mail address	francisco.melgarejo@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Profesor/a Permanente Laboral
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	1
Number of sexennia	1
No. of positive evaluations by Docentia	1
Name and surname	INMACULADA MORA JIMÉNEZ
E-mail address	inmaculada.mora@urjc.es

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Campus	Fuenlabrada
Category	Catedrático/a de Universidad
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	5
Number of sexennia	4
No. of positive evaluations by Docentia	6
Name and surname	ISABEL POLIMÓN OLABARRIETA
E-mail address	isabel.polimon@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	JORGE MARRERO FRANCÉS
E-mail address	jorge.marrero@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico

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Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	JOSÉ ANTONIO HERRANZ YAGÜE
E-mail address	joseantonio.yague@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	JOSÉ LUIS ROJO ÁLVAREZ
E-mail address	joseluis.rojo@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Catedrático/a de Universidad
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	5
Number of sexennia	4
No. of positive evaluations by Docentia	6
Name and surname	JUAN CARLOS BELINCHÓN PARAÍSO
E-mail address	juancarlos.belinchon@urjc.es

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Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	LAURA MARTÍNEZ MATEU
E-mail address	laura.martinez.mateu@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Profesor/a Permanente Laboral
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	1
Number of sexennia	1
No. of positive evaluations by Docentia	2
Name and surname	LEANDRO PEDRO CASTRO BOURNISSEN
E-mail address	leandropedro.castro@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico

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Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	LOURDES SAINZ DE LOS TERREROS SOLER
E-mail address	lourdes.sainz@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	MARÍA ISABEL SASTRE IBARRECHE
E-mail address	isabel.sastre@urjc.es
Department	Especialidades Médicas y Salud Pública
Campus	Fuenlabrada
Category	Profesor/a Asociado/a CC Salud (Vinc.)
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	MIGUEL RIVERO FERNÁNDEZ
E-mail address	miguel.riverof@urjc.es
Department	Especialidades Médicas y Salud Pública

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Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	0
Number of sexennia	0
No. of positive evaluations by Docentia	0
Name and surname	ÓSCAR BARQUERO PÉREZ
E-mail address	oscar.barquero@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Titular de Universidad
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	2
Number of sexennia	2
No. of positive evaluations by Docentia	3
Name and surname	REBECA GOYA ESTEBAN
E-mail address	rebeca.goyaesteban@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
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Person responsible for the subject	No

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Number of quinquennia	2
Number of sexennia	2
No. of positive evaluations by Docentia	3
Name and surname	SERGIO MUÑOZ ROMERO
E-mail address	sergio.munoz@urjc.es
Department	Teoría de la Señal y Comunicaciones y Sistemas Telemáticos y Computación
Campus	Fuenlabrada
Category	Titular de Universidad
Academic degree	Doctor
Person responsible for the subject	No
Tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/a a través de correo electrónico
Number of quinquennia	2
Number of sexennia	2
No. of positive evaluations by Docentia	2

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