



POLITÉCNICA

INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingenieros de  
Telecomunicacion

# ANX-PR/CL/001-01

## LEARNING GUIDE

### SUBJECT

**93000960 - Health Technology Business Management**

### DEGREE PROGRAMME

09AU - Master Universitario en Ingeniería Biomedica

### ACADEMIC YEAR & SEMESTER

2020/21 - Semester 1

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## 1. Description

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### 1.1. Subject details

<b>Name of the subject</b>	93000960 - Health Technology Business Management
<b>No of credits</b>	3 ECTS
<b>Type</b>	Compulsory
<b>Academic year of the programme</b>	First year
<b>Semester of tuition</b>	Semester 1
<b>Tuition period</b>	September-January
<b>Tuition languages</b>	English
<b>Degree programme</b>	09AU - Master Universitario en Ingeniería Biomedica
<b>Centre</b>	09 - Escuela Técnica Superior de Ingenieros de Telecomunicacion
<b>Academic year</b>	2020-21

## 2. Faculty

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### 2.1. Faculty members with subject teaching role

<b>Name and surname</b>	<b>Office/Room</b>	<b>Email</b>	<b>Tutoring hours *</b>
Francisco Gonzalez Sanchez (Subject coordinator)	A127	francisco.gonzalez.sanchez @upm.es	Sin horario. Appointment by e- mail.

\* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

## 3. Prior knowledge recommended to take the subject

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### 3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

### 3.2. Other recommended learning outcomes

- Foundations of Business Management

## 4. Skills and learning outcomes \*

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### 4.1. Skills to be learned

CB06 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB07 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CB08 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CB09 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CE-MIB02 - Analizar los procesos organizativos y de dirección de las empresas de ingeniería biomédica para aplicar herramientas de gestión en las distintas áreas funcionales de la misma.

CG-MIB01 - Resolver problemas e integrar conocimiento en temas nuevos o escasamente definidos y en entornos multidisciplinares del área de la Ingeniería Biomédica

CG-MIB02 - Analizar y aplicar la reglamentación correspondiente a la sensibilidad social y ética en los ámbitos de operación que pueden darse en Ingeniería Biomédica

CG-MIB03 - Utilizar la filosofía, el método científico y el método experimental para la búsqueda de innovación, la curiosidad científica y el desarrollo de actitudes creativas

CG-MIB04 - Utilizar las tecnologías de la información y la comunicación para la búsqueda de información, datos bibliográficos y adquisición de nuevo conocimiento para la formación permanente y el trabajo autónomo

CG-MIB05 - Utilizar técnicas de expresión oral y escrita para comunicar trabajos y conclusiones a comunidades de iguales o divulgación científica, elaboración de artículos, manuales de estilo y herramientas de edición para fomentar la capacidad de comunicación y diseminación de resultados

CG-MIB06 - Aplicar técnicas de trabajo colaborativo en equipos multidisciplinares internacionales y liderazgo, así como utilizar métodos para asumir la responsabilidad de orientar y dirigir trabajos científicos en el ámbito de la ingeniería Biomédica

CG-MIB07 - Utilizar la lengua inglesa como herramienta de trabajo

CG-MIB08 - Analizar y aplicar métodos de gestión, organización y planificación de proyectos avanzados en Ingeniería Biomédica

CG-MIB09 - Identificar y utilizar métodos para la búsqueda de recursos, la gestión económica y administrativa de proyectos avanzados en Ingeniería Biomédica

## 4.2. Learning outcomes

RA85 - EN\_RA9 - Performing individual and team work by searching information sources, critical discussion and presenting the results in oral presentations

RA84 - EN\_RA42 - Being comfortable with a hospital or a medical technology company context, using the competences acquired in the master's degree

RA82 - EN\_RA21 - Learning the concepts and tools associated to technology management

RA83 - EN\_RA3 - Developing the ability to search, store and process business information for decision making

RA80 - EN\_RA11 - Presenting the project in written, oral and public form

RA81 - EN\_RA2 - Applying terminology commonly used in business environments

\* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

## 5. Brief description of the subject and syllabus

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### 5.1. Brief description of the subject

The main course objectives are:

- To analyze the functions and roles of a biomedical engineer within an organization.
- To understand managerial concepts in a business environment.
- To develop the ability and skills to search, analyze and combine business information for decision making.
- To understand how to manage the main functional areas of a company: marketing, operations, finance, human resources and R&D.

## 5.2. Syllabus

1. Introduction to the sector
2. Strategic management
  - 2.1. The nature of Management Strategy. Business values and orientation
  - 2.2. External analysis
  - 2.3. Internal analysis
  - 2.4. Corporate strategies
  - 2.5. Business strategies
  - 2.6. Functional strategies
3. Marketing
  - 3.1. Introduction
  - 3.2. Strategic marketing
  - 3.3. Operative marketing
4. Operations Management
  - 4.1. Introduction
  - 4.2. Evolution and Strategies
  - 4.3. Supply chain
  - 4.4. Quality management
  - 4.5. Five P's (product, process, plan, programme and people)
5. Human Resources
  - 5.1. Planning, Recruiting, Selection, Training, Performance appraisal, and Compensation
6. Introduction to Innovation management (R&D)
  - 6.1. Concept and types of innovation. Disruptive innovation. Innovation management
7. Finance
  - 7.1. General concepts on financial cycles
  - 7.2. Main financial documents: Balance Sheet, Profit and Loss Statement, and Cash Flow Statement
  - 7.3. Cost Accounting: Basic Concepts

## 6. Schedule

### 6.1. Subject schedule\*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	<b>Main presentation of the course</b> Duration: 01:00 Lecture  <b>1. Introduction to the sector</b> Duration: 01:00 Lecture			
2	<b>2. Strategic management</b> Duration: 02:00 Lecture			
3	<b>2. Strategic management</b> Duration: 02:00 Lecture			
4	<b>2. Strategic management</b> Duration: 02:00 Lecture			
5			<b>2. Strategic management. Business presentation</b> Duration: 01:00 Problem-solving class  <b>2. Strategic management. Case 1</b> Duration: 01:00 Problem-solving class	<b>Case 1</b> Online test Continuous assessment Presential Duration: 00:00
6	<b>3. Marketing</b> Duration: 02:00 Lecture			<b>Test 1</b> Online test Continuous assessment Presential Duration: 00:00
7	<b>3. Marketing</b> Duration: 02:00 Lecture			
8	<b>3. Marketing</b> Duration: 02:00 Lecture			
9	<b>4. Operations management</b> Duration: 02:00 Lecture			<b>Test 2</b> Online test Continuous assessment Presential Duration: 00:00
10	<b>5. Human Resources</b> Duration: 01:00 Lecture		<b>Business Presentation - Introduction to the Final Case.</b> Duration: 01:00 Problem-solving class	



11	<p><b>6. Introduction to Innovation management (R&amp;D)</b> Duration: 01:00 Lecture</p> <p><b>7. Finance</b> Duration: 01:00 Lecture</p>			
12	<p><b>7. Finance</b> Duration: 01:00 Lecture</p>		<p><b>3-6. Marketing, Operations, Human Resources and Innovation. Case 2</b> Duration: 01:00 Problem-solving class</p>	<p><b>Test 3</b> Online test Continuous assessment Presential Duration: 00:00</p> <p><b>Case 2</b> Online test Continuous assessment Presential Duration: 00:00</p>
13	<p><b>Final presentation</b> Duration: 02:00 Additional activities</p>			<p><b>Final case</b> Group presentation Continuous assessment Presential Duration: 02:00</p> <p><b>Attendance and participation</b> Other assessment Continuous assessment Presential Duration: 00:00</p> <p><b>Case reports and deliverables</b> Individual work Final examination Not Presential Duration: 00:00</p>
14				
15				
16				
17				<p><b>Final exam</b> Written test Final examination Presential Duration: 03:00</p>

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

\* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

## 7. Activities and assessment criteria

### 7.1. Assessment activities

#### 7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
5	Case 1	Online test	Face-to-face	00:00	15%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07
6	Test 1	Online test	Face-to-face	00:00	10%	5 / 10	CE-MIB02 CG-MIB07 CG-MIB08
9	Test 2	Online test	Face-to-face	00:00	10%	5 / 10	CE-MIB02 CG-MIB07 CG-MIB08
12	Test 3	Online test	Face-to-face	00:00	10%	5 / 10	CE-MIB02 CG-MIB07 CG-MIB08
12	Case 2	Online test	Face-to-face	00:00	15%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07
13	Final case	Group presentation	Face-to-face	02:00	30%	5 / 10	CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08 CG-MIB09 CG-MIB01
13	Attendance and participation	Other assessment	Face-to-face	00:00	10%	0 / 10	CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08 CG-MIB09

#### 7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
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13	Case reports and deliverables	Individual work	No Presential	00:00	%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08 CG-MIB09
17	Final exam	Written test	Face-to-face	03:00	100%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08 CG-MIB09

### 7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Case reports and deliverables	Other assessment	Face-to-face	00:00	%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08 CG-MIB09
Final Exam	Written test	Face-to-face	03:00	100%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08 CG-MIB09

## 7.2. Assessment criteria

Due to the course methodology, **students will be graded through continuous assessment by default. Students who will not be able to attend the lessons are strongly advised against enrolling in this course.** Nonetheless, students who wish to renounce continuous assessment and opt for final exam assessment (comprising one or more course assignments or deliverables) must inform the course coordinator in writing, using the corresponding link in the course page in Moodle-UPM, before the end of the third week of the course. Additionally, at the same time, students who opt-out of continuous assessment must contact the course coordinator to be informed about the content and schedule of the alternative assignments.

**In order to qualify for continuous assessment, students must attend at least 80% of the sessions.**

Continuous assessment includes the following assignments and final grade weights:

- Test (3): 30%
- Cases (2): 30%
- Final Case: 30%
- Active participation in class: 10%

The evaluation will assess the competence level achieved by students. Therefore, students renouncing to continuous assessment and opting for final exam will be subject to all the assessment techniques used in continuous assessment (EX, ET, TG, etc.). The final exam will take place in the time and place approved by "Junta de Escuela" for the current academic semester and year. Evaluation assignments assessing learning outcomes that may not be assessed through a single exam can be completed and delivered during the semester following the instructions given by the course coordinator.

If a student opts for final exam assessment, the process will be as follows:

- The student must comply with the schedule of deliverables appointed by the course coordinator, and obtain a grade equal to or higher than 5.0 points. If any of the deliverables receives grades lower than 5.0 points, the final grade will be the average of those deliverables.
- If all the deliverables receive a grade equal to or higher than 5.0 points, the final exam will include questions about both theoretical and practical concepts seen in the course and developed in the deliverables. The final grade will then be calculated only upon the final exam score.

Assesment of the extraordinary final exam will follow the final exam assessment option only. In this case, the student must contact the course coordinator at least two weeks before the official examination date approved by "Junta de Escuela" because the deliverables must be sent at least one week before the examination date.

## 8. Teaching resources

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### 8.1. Teaching resources for the subject

Name	Type	Notes
Thompson, A. A., & Strickland, A. J. (2001). Strategic management: Concepts and cases. McGraw-Hill/Irvin. Chicago	Bibliography	
L. Boone, D. Kurtz. (2015) Contemporary Marketing (17th Edition)	Bibliography	
Kotler, P. (2015) Marketing Management (15th Edition)	Bibliography	
Slack, N., Chambers, S., & Johnston, R. (2009). Operations and process management: principles and practice for strategic impact. Pearson Education. Chicago	Bibliography	
<a href="http://moodle.upm.es/titulaciones/oficiales">http://moodle.upm.es/titulaciones/oficiales</a>	Web resource	Materials made by the course instructors: presentations, documents, cases, etc.

## 9. Other information

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### 9.1. Other information about the subject

- Communications between the instructor and students: In order to facilitate the communication with the instructors, and whenever the questions or doubts cannot be solved during the class, e-mail will be the preferred way to direct any inquiry, question or doubt about the course to the instructors. Additionally, office hours and meetings will also be requested by e-mail.
- Supporting tools and technologies: Certain tasks and activities may require the use of Moodle, Zoom or Microsoft Teams. If there is a mandate or recommendation for the use of other digital tools from the authorities (University, State), the information about the alternative means of communication/assessment/teaching will be communicated to the students in advance
- Sustainable development goals: the course aims to foster awareness and knowledge about the Sustainable Development Goals through the development and presentation of projects that motivate students to work on different solutions from a biomedical engineering perspective. More specifically, the course will contribute to substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship (SDG 4.4)