ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

93000960 - Health Technology Business Management

DEGREE PROGRAMME

09AU - Master Universitario En Ingenieria Biomedica

ACADEMIC YEAR & SEMESTER

2025/26 - Semester 1

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	93000960 - Health Technology Business Management
No of credits	3 ECTS
Type	Compulsory
Academic year ot the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	09AU - Master Universitario en Ingenieria Biomedica
Centre	09 - E.T.S. De Ingenieros De Telecomunicacion
Academic year	2025-26

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Francisco Gonzalez Sanchez	A-127	francisco.gonzalez.sanchez@upm.es	Sin horario. Appointment by e-mail.
Angel Hernandez Garcia (Subject coordinator)	A-127	angel.hernandez@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

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 *

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

RA3 - Desarrollar la capacidad de búsqueda, almacenamiento y tratamiento de información empresarial para la toma de decisiones.

RA1 - Analizar las funciones que desarrolla un ingeniero biomédico dentro de distintas organizaciones del sector

RA2 - Aplicar la terminología comúnmente empleada en entornos empresariales

* 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

5.1. Brief description of the subject

The main objectives of the course 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, human resources and finance.

5.2. Syllabus

1. Introduction

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. Human Resources

   4.1. Planning, Recruiting, Selection, Training, Performance appraisal, and Compensation

5. Finance

   5.1. General concepts on financial cycles

   5.2. Main financial documents: Balance Sheet, Profit and Loss Statement, and Cash Flow Statement

   5.3. Cost Accounting: Basic Concepts

6. Operations Management

   6.1. Introduction

   6.2. Evolution and Strategies

   6.3. Supply chain

   6.4. Quality management

   6.5. Five P's (product, process, plan, programme and people)

6. Schedule

6.1. Subject schedule*

Week	Type 1 activities	Type 2 activities	Distant / On-line	Assessment activities
1	**Course presentation** Duration: 01:00 Lecture **1. Introduction** Duration: 01:00 Lecture			
2	**2. Strategic management** Duration: 02:00 Lecture			
3	**2. Strategic management** Duration: 02:00 Lecture			
4	**2. Strategic management** Duration: 02:00 Lecture			
5	**Industry presentation** Duration: 01:00 Additional activities **Business Presentation - Introduction to the Final Case** Duration: 01:00 Additional activities			
6	**3. Marketing** Duration: 01:50 Lecture **Test** Duration: 00:10 Additional activities			**Test** Written test Progressive assessment Presential Duration: 00:00
7	**Industry presentation** Duration: 02:00 Additional activities			
8		**Team Presentation 1** Duration: 02:00 Additional activities		**Team presentation 1** Group presentation Progressive assessment Presential Duration: 00:00
9		**Case 1** Duration: 02:00 Additional activities		**Case 1** Other assessment Progressive assessment Presential Duration: 00:00

10	**4. Human resources** Duration: 01:00 Lecture **5. Finance** Duration: 01:00 Lecture			
11	**6. Operations management** Duration: 01:00 Lecture	**Team Presentation 2** Duration: 01:00 Additional activities		**Team presentation 2** Group presentation Progressive assessment Presential Duration: 00:00
12	**6. Operations management** Duration: 01:00 Lecture	**Team Presentation 2** Duration: 01:00 Additional activities		
13		**Case 2** Duration: 02:00 Additional activities		**Case 2** Other assessment Progressive assessment Presential Duration: 00:00
14		**Final case presentation** Duration: 02:00 Additional activities		**Final case presentation** Group presentation Progressive assessment and Global Examination Presential Duration: 00:00
15				
16				
17				**Final exam** Written test Global examination Presential Duration: 02:00

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.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
6	Test	Written test	Face-to-face	00:00	10%	0 / 10	CE-MIB02 CG-MIB07 CG-MIB08
8	Team presentation 1	Group presentation	Face-to-face	00:00	10%	0 / 10	CE-MIB02 CG-MIB07 CG-MIB08
9	Case 1	Other assessment	Face-to-face	00:00	15%	0 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07
11	Team presentation 2	Group presentation	Face-to-face	00:00	10%	0 / 10	CE-MIB02 CG-MIB07 CG-MIB08
13	Case 2	Other assessment	Face-to-face	00:00	15%	0 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07
14	Final case presentation	Group presentation	Face-to-face	00:00	40%	0 / 10	CG-MIB01 CG-MIB02 CB06 CB07 CB08 CB09 CB10 CE-MIB02 CG-MIB03 CG-MIB04 CG-MIB05 CG-MIB06 CG-MIB07 CG-MIB08 CG-MIB09

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
14	Final case presentation	Group presentation	Face-to-face	00:00	40%	0 / 10	CG-MIB01 CG-MIB02 CB06 CB07 CB08 CB09 CB10 CE-MIB02 CG-MIB03 CG-MIB04 CG-MIB05 CG-MIB06 CG-MIB07 CG-MIB08 CG-MIB09
17	Final exam	Written test	Face-to-face	02:00	60%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Final Exam	Written test	Face-to-face	02:00	60%	5 / 10	CG-MIB01 CE-MIB02 CG-MIB05 CG-MIB07 CG-MIB08
Final case presentation	Group presentation	Face-to-face	00:00	40%	0 / 10	CG-MIB01 CG-MIB02 CB06 CB07 CB08 CB09 CB10 CE-MIB02 CG-MIB03 CG-MIB04 CG-MIB05 CG-MIB06 CG-MIB07 CG-MIB08 CG-MIB09

7.2. Assessment criteria

The competency CG-MIB06 is developed through the final case activity. As this activity cannot be assessed outside the official teaching period, **it is considered mandatory and non-recoverable**, both for the global and the extraordinary call assessment. Submission guidelines will be specified during the course introduction session and will be published on the Moodle platform as the course progresses. Students must contact the course coordinator within the first two weeks of class should they have any questions or require clarification.

Progressive assessment

In this mode, course assessment will be as follows:

- One test related to the course topics (10% of the total grade).
- Two case studies related to the course topics (30% of the total grade; 15% each).
- Two group presentations on a specific topic related to the course (20% of the total grade, 10% each).
    - The grade in this activity includes the document delivered and the oral presentation.
    - Students who do not participate in the oral presentation will receive a grade of 0 points (out of 10).
    - The second presentation (Team presentation 2) is divided into two parts. The two parts of the presentations are given in two consecutive weeks. Due to limitations of the learning guide creation tool, only the week of the first presentation is shown in the assessment column in the schedule and in the list of assessments.
- Final case (40% of the total grade): students must collaboratively elaborate, deliver and defend (in an oral presentation) the final project based on the instructions provided during the first sessions of the course and in Moodle (http://moodle.upm.es/titulaciones/oficiales).
    - The deadline for submission of the final case documentation is five days prior to the date of oral presentation.
    - The grade in this activity includes the document delivered and the oral presentation.
    - Students who do not participate in the oral presentation will receive a grade of 0.

Global assessment

In this mode, course assessment will be as follows:

- Final exam (60% of the total grade): the final exam will cover the entire syllabus of the course and may include problem-solving exercises, theoretical questions, and multiple-choice questions. The exam may be

conducted either orally or in writing. The minimum grade necessary to pass the exam is 5 points (out of 10).
- Final case (40% of the total grade): as a mandatory, non-recoverable activity, the same rules for final case in progressive assessment apply here.

If a student does not reach the minimum grade in any of the components, the final grade will be equal to the arithmetic mean of the assessment components that did not meet the minimum grade.

Extraordinary call

The assessment will determine whether students have acquired the competencies of the course. Therefore, the evaluation in the extraordinary session will use the same types of assessment methods as those used in the regular session (EX, ET, TG, etc.).

In this mode, course assessment will be as follows:

- Final exam (60% of the total grade): the final exam will cover the entire syllabus of the course and may include problem-solving exercises, theoretical questions, and multiple-choice questions. The exam may be conducted either orally or in writing. The minimum grade necessary to pass the exam is 5 points (out of 10).
- Final case (40% of the total grade): as a mandatory, non-recoverable activity, the same rules for final case in progressive and global assessment apply here.

If a student does not reach the minimum grade in any of the components, the final grade will be equal to the arithmetic mean of the assessment components that did not meet the minimum grade.

Unless explicitly stated, any submitted assessment may be subject to an additional oral examination by the instructor in order to verify that the work has been completed independently by the student, without the use of artificial intelligence systems. Should this verification be required, or in cases of total or partial plagiarism in any submission, the student will receive a grade of zero for the corresponding assessment period.

8. Teaching resources

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	
http://moodle.upm.es/titulaciones/oficiales	Web resource	Materials made by the course instructors: presentations, documents, cases, etc.

9. Other information

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 might 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).