



COURSE: Introduction to Biomedical Engineering

DEGREE: Biomedical Engineering

YEAR: 2025/2026

TERM: 1st

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	Indicate YES/NO If the session needs 2 teachers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	Course presentation & Biomedical engineering	X				Professor: Mónica Abella / Manuel Desco / Beatriz Salinas	1,6	
1	2	Basics on Digital Image I		X	X	X	Professor: Mónica Abella	1,6	
2	3	Bio-effects of Radiation and E/M Fields	X				Professor: Manuel Desco	1,6	
2	4	Basics on Digital Image II		X	X	X	Professor: Mónica Abella	1,6	
3	5	Medical Image Systems I	X				Professor: Mónica Abella	1,6	
3	6	Medical Image Systems II		X	X	X	Professor: Mónica Abella		
4	7	Medical Image Systems III	X				Professor: Manuel Desco	1,6	
4	8	Practical issues in instrumentation: SNR, dB, amplifier, filter		X			Professor: Daniel Sanderson	1,6	
5	9	EXAMPLE: PET/CT	X				Professor: Manuel Desco	1,6	
5	10	LAB: Optical imaging: milk experiment		X	X	X	BiiG laboratories (1.0.G14 / 1.0.G15) Professor: Daniel Sanderson	1,6	

6	11	Biomedical devices	X				Professor: Daniel Sanderson	1,6	
6	12	LAB: ECG		X			BiiG laboratories (1.0.G14 / 1.0.G15) Professor: Daniel Sanderson	1,6	
7	13	TEST on sessions 2-7, and 9 (15 minutes) Nanotechnology and nanomedicine	X				Professor: Beatriz Salinas	1,6	
7	14	LAB: Synthesis of nanoparticles		X	X	X	BiiG laboratories (1.0.G14 / 1.0.G15) Professor: Beatriz Salinas	1,6	
8	15	EXAMPLE: Molecular imaging in oncology	X				Professor: Beatriz Salinas	1,6	
8	16	LAB: BioMEMs prototype		X			BiiG laboratories (1.0.G14 / 1.0.G15) Professor: Beatriz Salinas	1,6	
9	17	Bio-Molecular Principles: DNA structure	X				Professor: Iria Medraño	1,6	
9	18	Bio-Molecular Principles: DNA replication and repair		X			Professor: Iria Medraño	1,6	
10	19	TEST on sessions 8 and 10-16 (15 minutes) Bio-Molecular Principles: DNA transcription (RNA synthesis)	X				Professor: Iria Medraño	1,6	
10	20	Bio-molecular principles: Protein synthesis and structure		X			Professor: Iria Medraño	1,6	
11	21	Introduction to Cells I	X				Professor: Marcela Del Río	1,6	
11	22	Introduction To Cells II		X			Professor: Marcela Del Río	1,6	
12	23	TEST on Bio-Molecular Principles sessions 15-18 (15 minutes) Introduction to Tissue and Organs	X				Professor: Marcela Del Río	1,6	
12	24	Introduction to Tissue Engineering		X			Professor: Marcela Del Río	1,6	
13	25	EXAMPLE: Respirators	X				Professor: Manuel Desco	1,6	
13	26	EXAMPLE: Artificial intelligence applications		X			Professor: Manuel Desco	1,6	
14	27	TEST on cells and tissue engineering sessions 17-20 (15 minutes) EXAMPLE: Deep brain stimulation – preclinical research	X				Professor: Maria Luisa Soto	1,6	
14	28	Innovation (technology transfer examples)		X			Professor: Manuel Desco	1,6	

Subtotal 1 **41,6**

Total 1 (Hours of class plus student homework hours between weeks 1-14)

Subtotal 2 **3**

Total 2 (Hours of class plus student homework hours between weeks 15-18)

TOTAL A (Total 1 + Total 2)

LABORATORIES CLASSES PROGRAMMING						
WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
	1	Visit to a research center: CIEMAT	CIEMAT	The visit will be in four groups (1 day). This visit will depend on the sanitary situation due to COVID19. If necessary, it will be substituted by a practical session with videos and discussion.	1,6	
	2	Visit to a hospital: HGGM. Radiotherapy, Radiology, Nuclear and Experimental Services. Flow cytometry, auto-analyzer. Small animal.	HGGM	The visit will be in six groups (3 days). This visit will depend on the sanitary situation due to COVID19. If necessary, it will be substituted by a practical session with videos and discussion.	1,6+1.6	
Subtotal 3					4.8	
Total 3 (Hours of class plus student homework hours of ten sessions laboratories)						
TOTAL B (Total 3)						
TOTAL (Total A + Total B. Maximum 180 hours)						