



COURSE: Advanced Biomaterials, 3D Bioprinting and Micro/nano Biofabrication									
DEGREE: Biomedical Engineering						YEAR: 2023/2024		TERM: 2	
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 Tue 30 Jan	1	Introduction to the course (Overview + objectives) Analysis of stem cell niches: micro- and nano-scale surface engineering I	X				Reading of proposed topics. Bibliographic research	1.6	6
1 Wed 31 Jan	2	Analysis of stem cell niches: micro- and nano-scale surface engineering II	X				Reading of proposed topics. Bibliographic research	1.6	
2 Tue 6 Feb	3	Analysis of stem cell niches: micro- and nano-scale surface engineering III		X			Presentation and discussion of some practical examples, problems and articles	1.6	6
2 Wed 7 Feb	4	Microfabrication I	X				Reading of proposed topics. Bibliographic research	1.6	
3 Tue 13 Feb	5	Microfabrication II	X				Reading of proposed topics. Bibliographic research	1.6	6
3 Wed 14 Feb	6	Tissue-organ-on a chip I	X				Reading of proposed topics. Bibliographic research	1.6	
4 Tue 20 Feb	7	Tissue-organ-on a chip II		X			Presentation and discussion of some practical examples, problems and articles	1.6	6

4 <b>Wed 21 Feb</b>	8	Finding inspiration in nature: spider silk-based biomaterials	x				Reading of proposed topics. Bibliographic research	1.6	
5 <b>Tue 27 Feb</b>	9	Experimental research I		x			Practical activity	1.6	6
5 <b>Wed 28 Feb</b>	10	Nanotechnologies for drug, protein and gene delivery I	x				Reading of proposed topics. Bibliographic research	1.6	
6 <b>Tue 05 Mar</b>	11	Nanotechnologies for drug, protein and gene delivery II	x				Reading of proposed topics. Bibliographic research	1.6	6
6 <b>Wed 06 Mar</b>	12	Nanotechnologies for drug, protein and gene delivery III	x				Reading of proposed topics. Bibliographic research	1.6	
7 <b>Tue 12 Mar</b>	13	Nanotechnologies for drug, protein and gene delivery IV		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
7 <b>Wed 13 Mar</b>	14	Introduction to bioprinting I	x				Reading of proposed topics. Bibliographic research	1.6	
8 <b>Tue 19 Mar</b>	15	<b>CONTINUOUS EVALUATION: TEST</b>						1.6	6
8 <b>Wed 20 Mar</b>	16	Introduction to bioprinting II	x	x			Reading of proposed topics. Bibliographic research Presentation and discussion of some practical examples, problems and articles	1.6	
9 <b>Tue 02 Apr</b>	17	3D skin bioprinting	x				Reading of proposed topics. Bibliographic research	1.6	6
9 <b>Wed 03 Apr</b>	18	Design a microfabricated device activity: practical session		x			Practical session	1.6	
10 <b>Tue 09 Apr</b>	19	Atomic force microscopy of living cells	x				Reading of proposed topics. Bibliographic research	1.6	6
10 <b>Wed 10 Apr</b>	20	Experimental research II		x			Practical activity	1.6	
11 <b>Tue 16 Apr</b>	21	Polymer hydrogels: structure and rheological characterization	x				Reading of proposed topics. Bibliographic research	1.6	6
11 <b>Wed 17 Apr</b>	22	Seminar: design 3D objects I		x			Practical activity	1.6	
12 <b>Tue 23 Apr</b>	23	Seminar: design 3D objects II		x			Practical activity	1.6	6
12 <b>Wed 24 Apr</b>	24	Experimental research III		x			Practical activity	1.6	
13 <b>Tu 30 Apr</b>	25	Presentation by students I		x			Practical activity	1.6	6

14 Tue 07 May	26	Presentation by students II		x			Practical activity	1.6	
<b>Subtotal 1</b>								<b>41.6</b>	<b>78</b>
<b>Total 1</b> (Hours of class plus student homework hours between weeks 1-14)								<b>119.6</b>	

15		Tutorials, handing in, etc						1.5	
16		Assessment						3	6
17									
18									
<b>Subtotal 2</b>								<b>4.5</b>	<b>6</b>
<b>Total 2</b> (Hours of class plus student homework hours between weeks 15-18)								<b>10.5</b>	

<b>TOTAL A</b> (Total 1 + Total 2)								<b>130.1</b>	
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LABORATORIES CLASSES PROGRAMMING (*)						
WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
	1	Cationic polymers for gene transfection I	UC3M Bioengineering Labs		2	2
	2	Cationic polymers for gene transfection II	UC3M Bioengineering Labs		2	2
	3	3D Bioprinting I	UC3M Bioengineering Labs		2	2
	4	3D Bioprinting II	UC3M Bioengineering Labs		2	2
<b>Subtotal 3</b>					<b>8</b>	<b>8</b>
<b>Total 3</b> (Hours of class plus student homework hours of ten sessions laboratories)					<b>16</b>	
<b>TOTAL B</b> (Total 3)					<b>16</b>	
<b>TOTAL</b> (Total A + Total B. Maximum 180 hours)					<b>146.1</b>	

(\*) In EPS are given an additional 16 hours of laboratory practices along ten sessions.