Universidad Carlos III de Madrid
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COURSE: Advanced Biomaterials, 3D Bioprinting and Micro/nano Biofabrication		
DEGREE: Biomedical Engineering	**YEAR: 2020/2021**	**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	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	2	Analysis of stem cell niches: micro- and nano-scale surface engineering II	x				Reading of proposed topics. Bibliographic research	1.6	
2	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	4	Microfabrication I	x				Reading of proposed topics. Bibliographic research	1.6	
3	5	Microfabrication II	x				Reading of proposed topics. Bibliographic research	1.6	6

3	6	Tissue-organ-on a chip I	x				Reading of proposed topics. Bibliographic research	1.6	
4	7	Tissue-organ-on a chip II	x	x			Reading of proposed topics. Bibliographic research. Presentation and discussion of some practical examples, problems and articles	1.6	6
4	8	Experimental research I		x			Presentation and discussion of some practical examples, problems and articles	1.6	
5	9	Experimental research II		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
5	10	Introduction to bioprinting I	x				Reading of proposed topics. Bibliographic research	1.6	
6	11	Introduction to bioprinting II		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
6	12	CONTINUOUS EVALUATION: TEST						1.6	
7	13	Experimental research III		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
7	14	3D skin bioprinting	x				Reading of proposed topics. Bibliographic research	1.6	
8	15	Experimental research IV		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
8	16	Polymer hydrogels: structure and rheological characterization	x				Reading of proposed topics. Bibliographic research	1.6	
9	17	Experimental research V		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
9	18	Seminar: design 3D objects I		x			Presentation and discussion of some practical examples, problems and articles	1.6	
10	19	Seminar: design 3D objects II		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
10	20	Finding inspiration in nature: spider silk-based biomaterials	x				Reading of proposed topics. Bibliographic research	1.6	
11	21	Experimental research VI		x			Presentation and discussion of some practical examples, problems and articles	1.6	6
11	22	Atomic force microscopy of living cells	x				Reading of proposed topics. Bibliographic research	1.6	
12	23	Nanotechnologies for drug,	x				Reading of proposed topics.	1.6	6

		protein and gene delivery I					Bibliographic research		
12	24	Nanotechnologies for drug, protein and gene delivery II	x				Reading of proposed topics. Bibliographic research	1.6	
13	25	Nanotechnologies for drug, protein and gene delivery III	x				Reading of proposed topics. Bibliographic research	1.6	6
13	26	Nanotechnologies for drug, protein and gene delivery IV		x			Presentation and discussion of some practical examples, problems and articles	1.6	
14	27	Presentation by students I		x				1.6	6
14	28	Presentation by students II		x				1.6	
							Subtotal 1	**44.8**	**84**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	128.8	

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

TOTAL A *(Total 1 + Total 2)*	**139.3**

LABORATORIES CLASSES PROGRAMMING (*)

WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
	1	Microfabrication of microfluidic chips I	UC3M Bioengineering Labs		1.6	1
	2	Microfabrication of microfluidic chips II	UC3M Bioengineering Labs		1.6	1
	3	3D Bioprinting I	UC3M Bioengineering Labs		1.6	1
	4	3D Bioprinting II	UC3M Bioengineering Labs		1.6	1

	5	Smart-hydrogels for drug delivery I	UC3M Bioengineering Labs		1.6	1
	6	Smart-hydrogels for drug delivery II	UC3M Bioengineering Labs		1.6	1
				Subtotal 3	**9.6**	**6**
				Total 3 *(Hours of class plus student homework hours of ten sessions laboratories)*	**15.6**	
				TOTAL B *(Total 3)*	**15.6**	
TOTAL *(Total A + Total B. Maximum 180 hours)*					**154.9**	

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