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)
Tu 28 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
Fr 31 Jan	2	Analysis of stem cell niches: micro- and nano-scale surface engineering II	x	x			Reading of proposed topics. Bibliographic research. Presentation and discussion of some practical examples, problems and articles	1.6	
Tu 04 Feb	3	Microfabrication I	x				Reading of proposed topics. Bibliographic research	1.6	6
Fr 07 Feb	4	Microfabrication II	x				Reading of proposed topics. Bibliographic research	1.6	

Tu 11 Feb	5	Tissue-organ-on a chip I	x				Reading of proposed topics. Bibliographic research	1.6	6
Th 14 Feb	6	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	
Tu 18 Feb	7	Experimental research I		x			UC3M Bioengineering Labs	1.6	6
Fr 21 Feb	8	Experimental research II		x			UC3M Bioengineering Labs	1.6	
Tu 25 Feb	9	Introduction to bioprinting	x				Reading of proposed topics. Bibliographic research	1.6	6
Fr 28 Feb	10	Experimental research III		x			UC3M Bioengineering Labs	1.6	
Tu 03 Mar	11	3D skin bioprinting	x	x			Reading of proposed topics. Bibliographic research. Presentation and discussion of some practical examples, problems and articles	1.6	6
Fr 06 Mar	12	Practical session I: design 3D objects		x	x		Practical training session	1.6	
Tu 10 Mar	13	Polymer hydrogels: structure and rheological characterization	x				Reading of proposed topics. Bibliographic research	1.6	6
Fr 13 Mar	14	Atomic force microscopy of living cells	x				Reading of proposed topics. Bibliographic research	1.6	
Tu 17 Mar	15	CONTINUOUS EVALUATION: TEST						1.6	6
Fr 20 Mar	16	Experimental research IV		x			UC3M Bioengineering Labs	1.6	
Tu 24 Mar	17	Finding inspiration in nature: spider silk-based biomaterials	x				Reading of proposed topics. Bibliographic research	1.6	6
Fr 27 Mar	18	Experimental research V		x			UC3M Bioengineering Labs	1.6	
Tu 31 Mar	19	Experimental research VI		x			UC3M Bioengineering Labs	1.6	6
Fr 03 Apr	20	Experimental research VII		x			UC3M Bioengineering Labs	1.6	
Tu 14 Apr	21	Nanotechnologies for drug, protein and gene delivery I	x				Reading of proposed topics. Bibliographic research	1.6	6
Fr 17 Apr	22	Nanotechnologies for drug, protein and gene delivery II	x				Reading of proposed topics. Bibliographic research	1.6	
Tu 21 Apr	23	Nanotechnologies for drug, protein and gene delivery III	x				Reading of proposed topics. Bibliographic research	1.6	6

Fr 24 Apr	24	Nanotechnologies for drug, protein and gene delivery IV		x			Presentation and discussion of some practical examples, problems and articles	1.6	
Tu 28 Apr	25	Presentation by students I		x				1.6	6
Tu 05 May	26	Presentation by students II		x				1.6	
							Subtotal 1	**41.6**	**78**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	119.6	

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)*	**130.1**	

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	Teams of 10 students	1.6	1
	2	Microfabrication of microfluidic chips II	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	3	Microfabrication of microfluidic chips III	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	4	Microfabrication of microfluidic chips IV	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	5	3D Bioprinting I	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	6	3D Bioprinting II	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	7	3D Bioprinting III	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	8	Cationic polymers for gene transfection I	UC3M Bioengineering Labs	Teams of 10 students	1.6	1

	9	Cationic polymers for gene transfection II	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
	10	Cationic polymers for gene transfection III	UC3M Bioengineering Labs	Teams of 10 students	1.6	1
				Subtotal 3	**16**	**10**
				Total 3 *(Hours of class plus student homework hours of ten sessions laboratories)*	**26**	
				TOTAL B *(Total 3)*	**26**	
TOTAL *(Total A + Total B. Maximum 180 hours)*					**156.1**	

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