



COURSE: BIOMEDICAL APPLICATIONS OF NANOTECHNOLOGY

DEGREE: BIOMEDICAL ENGINEERING

YEAR: 2020/2021

TERM: 2nd

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 08FEB21	1	Introduction to nanotechnology		X			Course introduction & student activity	1,6	6
1 10FEB21	2	Organic chemistry	M1				Reading of proposed topics & student activity	1,6	
2 15FEB21	3	Synthetic organic chemistry	M2				Reading of proposed topics & student activity	1,6	6
2 17FEB21	4	Imaging and characterizing the nanoscale: SEM, TEM, cryo-EM, super-resolution microscopy	M3				Reading of proposed topics & student activity	1,6	
3 22FEB21	5	Imaging and characterizing the nanoscale: X-ray, AFM, nanoindentation	M4				Reading of proposed topics & student activity	1,6	6
3 24FEB21	6	Nanofabrication: Nanolithography, molecular self-assembly, electrically induced nanopatterning, X-ray	M5				Reading of proposed topics & student activity	1,6	

4 01MAR21	7	Nanosensors and instrumentation for clinical applications: Rod/nanowire-like materials	M6				Reading of proposed topics & student activity	1,6	3
5 08MAR21	9	Nanosensors and instrumentation for clinical applications: Nano-bioelectronics interfaces, nano-MEMS	M7				Reading of proposed topics & student activity	1,6	6
5 10MAR21	10	Nanosensors and instrumentation for clinical applications: FO sensors	M8				Reading of proposed topics & student activity	1,6	
6 15MAR21	11	Seminar. (Samira Naghdi) Biomedical applications of graphene. Nanodevices for the separation of biomolecules and cells: Superparamagnetic nanoparticles	M9	X			Seminar Reading of proposed topics & student activity	1,6	3
7 22MAR21	13	The alphabet game I		X			Midterm	1,6	6
7 24MAR21	14	Nanodevices for manipulation of cells and biomolecules: Optical tweezers, photonic crystal resonators and nanorobots	M10				Reading of proposed topics & student activity	1,6	
8 29MAR21		Easter holidays							
8 31MAR21		Easter holidays							
9 05APR21		Easter holidays							
9 07APR21	15	Nanoparticles for drug and gene delivery: Exosomes	M11				Reading of proposed topics & student activity	1,6	3
10 12APR21	16	Seminar (Lidia Gómez Cid) – Unraveling the antiarrhythmic properties of cell therapies. Exosome characterization on TEM images.		X			Seminar Computer session	1,6	6
10 14APR21	17	Nanoparticles for drug and gene delivery: Dendrimers and polymeric particles	M13				Reading of proposed topics & student activity	1,6	

11 19APR21	18	Nanoparticles for drug and gene delivery: Liposomes	M14					Reading of proposed topics & student activity	1,6	
11 22APR21	20	NanotechStart'21		X				Tutorial		9
12 26APR21	21	Nanoparticles for drug and gene delivery: Gold nanoparticles	M15					Reading of proposed topics & student activity	1,6	
13 03MAY21		Holiday								
13 05MAY21	23	Bioconjugation techniques with proteins	M16					Reading of proposed topics & student activity	1,6	6
13 06MAY21	24	The alphabet game II						Midterm	1,6	
14 10MAY21	25	Characterization of liposomes lab Seminar (Angel Camacho, UCV): Covid19 vaccines based on nanotechnology.		X				Remote lab session Seminar	1,6	9
14 12MAY21	26	Bioconjugation techniques with antibodies	M17					Reading of proposed topics & student activity	1,6	
14 17MAY21	27	NanotechStart'21		X				Student activity	1,6	
15 19MAY21	28	Modification and functionalization of nanoparticles for diagnosis and therapy	M18					Reading of proposed topics & student activity	1,6	3
			115					Subtotal 1	44,8	72
15	29	Tutorials, handling in, etc				Examples and exercises	1,6			
15	30	Tutorials, handling in, etc						Examples and exercises	1,6	
16		Assessment							6	
16		Assessment							6	
17										

				Total 2 <i>(Hours of class plus student homework hours between weeks 16-19)</i>	9,2					Subtotal 2	15,2
				TOTAL A (Total 1 + Total 2)						132,0	

LABORATORIES CLASSES PROGRAMMING (*)						
WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
4 03MAR21	8	X-ray lab	1.0.G15		1,6	3
6 17MAR21	12	FO sensor lab	1.0.G15		1,6	3
11 21APR21	19	Synthesis of liposomes lab	1.0.G15		1,6	3
12 28APR21	22	Synthesis of citrate-coated gold NPs	1.0.G15		1,6	3

Subtotal 3	6,4	12,0
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Total 3 (Hours of class plus student homework hours of ten sessions laboratories)	18,4	
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TOTAL B (Total 3)	18,4	
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TOTAL (Total A + Total B. Maximum 180 hours)	150,4	
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() In EPS are given an additional 16 hours of laboratory practices along ten sessions.*