



COURSE: BIOMEDICAL APPLICATIONS OF NANOTECHNOLOGY									
DEGREE: BIOMEDICAL ENGINEERING						YEAR: 2018/2019		TERM: 2 nd	
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 (29/01)	1	Introduction to nanotechnology. Basic concepts					Reading of proposed topics	1,6	6
1 (01/02)	2	Nanofabrication: Nanolithography, molecular self-assembly, electrically induced nanopatterning	M1				Reading of proposed topics & student activity	1,6	
2 (05/02)	3	Organic chemistry		X			Reading of proposed topics & student activity	1,6	6
2 (08/02)	4	Synthetic organic chemistry		X			Reading of proposed topics & student activity	1,6	
3 (12/02)	5	Imaging and characterizing the nanoscale: AMF, TEM, SEM	M2				Reading of proposed topics & student activity	1,6	6
3 (15/02)	6	Imaging and characterizing the nanoscale: Super-resolution microscopy, Raman imaging	M3				Reading of proposed topics & student activity	1,6	

4 (19/02)	7	Imaging and characterizing the nanoscale: NMR, MR spectroscopy		X			Reading of proposed topics & student activity	1,6	6
4 (22/02)	8	Nanosensors for clinical applications: Nano-bioelectronic interfaces, nano-NEMS	M4				Reading of proposed topics & exam	1,6	
5 (26/02)	9	Nanosensors for clinical applications: Rod/nanowire-like materials, carbon nanotubes	M5				Reading of proposed topics & student activity	1,6	6
5 (01/03)	10	Nanosensors for clinical applications: BioFETs	M6	X			Reading of proposed topics & student activity	1,6	
6 (05/03)	11	Nanosensors for clinical applications: FO sensors	M7				Reading of proposed topics & student activity	1,6	6
6 (08/03)	12	Imaging nanodevices: Quantum dots, plasmonic nanoparticles - Partial exam		X			Reading of proposed topics & exam	1,6	
7 (12/03)	13	Practice. FO functionalization		X			Practice	1,6	6
7 (15/03)	14	Nanodevices for manipulation of cells and biomolecules: Optical tweezers, photonic crystal resonators	M8				Reading of proposed topics & student activity	1,6	
8 (19/03)	15	Nanodevices for manipulation of cells and biomolecules: Nanorobots, superparamagnetic nanoparticles	M9				Reading of proposed topics & student activity	1,6	6
8 (22/03)	16	Nanoparticles for drug and gene delivery: Gold nanoparticles	M10				Reading of proposed topics & student activity	1,6	
9 (26/03)	17	Practice. Exosome characterization on TEM images		X			Practice	1,6	6
9 (29/03)		Nanoparticles for drug and gene delivery: Exosomes	M11				Reading of proposed topics & student activity	1,6	
10 (02/04)		Practice. Synthesis of citrate-coated gold NPs		X			Practice	1,6	6
10 (05/04)		Nanoparticles for drug and gene delivery: Liposomes, dendrimers and polymeric particles	M12				Reading of proposed topics & student activity	1,6	

11 (09/04)	18	Practice. Synthesis of liposomes		X			Practice	1,6	6
11 (12/04)	19	Bioconjugation techniques with proteins	M13				Reading of proposed topics & student activity	1,6	
12 (16/04)	20	Easter							
12 (19/04)	21	Easter							
13 (23/04)	22	Bioconjugation techniques with antibodies	M14				Reading of proposed topics & student activity	1,6	6
13 (26/04)	23	Modification and functionalization of nanoparticles for diagnosis and therapy	M15				Reading of proposed topics & student activity	1,6	
14 (30/04)	24	Potential use of DNA for electronic and computer applications	M16				Reading of proposed topics & student activity	1,6	3
14 (03/05)		Labor Day Holiday							
15 (07/05)	25	Safety and toxicity concerns of nanosystems		X			Reading of proposed topics & student activity	1,6	6
15 (10/05)	26	Visit – Nanoscience facility		X				1,6	

Subtotal 1

43,2

81

Total 1 (Hours of class plus student homework hours between weeks 1-15)

124,2

16 (14/05)		Tutorials, handing in, etc		X			Examples and exercises	1,6	
16 (17/05)		Tutorials, handing in, etc		X			Examples and exercises	1,6	
17		Assessment						6	
17									
18									

Subtotal 2

9,2

Total 2 (Hours of class plus student homework hours between weeks 16-19)

9,2

TOTAL A (Total 1 + Total 2)

133,4

LABORATORIES CLASSES PROGRAMMING (*)						
WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
7 (12/03)	1	FO functionalization	Lab 1.0.G15 (Bioengineering)		1,6	1,6
9 (26/03)	2	Exosome characterization on TEM images	Lab 1.0.G15 (Bioengineering)		1,6	1,6
10 (02/04)	3	Synthesis of liposomes	Lab 1.0.G15 (Bioengineering)		1,6	1,6
11 (09/04)	4	Synthesis of citrate-coated gold NPs	Lab 1.0.G15 (Bioengineering)		1,6	1,6
Subtotal 3					6,4	6,4
Total 3 (Hours of class plus student homework hours of ten sessions laboratories)					12,8	
TOTAL B (Total 3)					12,8	
TOTAL (Total A + Total B. <i>Maximum 180 hours</i>)					146,2	

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