



COURSE: Introduction to the design of medical instrumentation

DEGREE: Bachelor in Biomedical Engineering

YEAR: 2014/2015

TERM: 2º

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 – Origin of Biopotentials	X					1,6	4
1	2	Introduction to the practices (LabView)		X	YES			1,6	
2	3	Techniques to record Biopotentials	X					1,6	4
2	4	Electrical safety. Datasheets		X				1,6	
3	5	Basic Concepts of Medical Instrumentation	X					1,6	4
3	6	Homework 1. Lab. Instrumentation		X				1,6	
4	7	Electrocardiology	X					1,6	4
4	8	ECG characteristics		X				1,6	
5	9	Analogic Amplifiers	X					1,6	4
5	10	Analogic Filtering		X				1,6	
6	11	Homework 2. Signal processing exercises	X					1,6	4
6	12	Sensors		X				1,6	
7	13	Sensors conditioning circuits	X					1,6	4

7	14	Homework 3. Recording bioelectrical potentials: electrons & electrolyte		X				1,6	
8	15	Review 1	X					1,6	4
8	16	Partial Exam (Sesions 1-12)		X				1,6	
9	17	Blood pressure and sounds	X					1,6	4
9	18	Measurement of flow and volume of blood		X				1,6	
10	19	Homework 4. EEG/MEG. Electroencephalogram and Magnetroencephalogram	X					1,6	4
10	20	Pulseoximetry		X				1,6	
11	21	EMG/ENG. Electromyogram and electroneurogram	X					1,6	4
11	22	Homework 5. Specific designs for EMG/ENG/EEG/MEG		X				1,6	
12	23	Implantable devices. Pacemakers and Defibrillators	X					1,6	4
12	24	Homework 6. Designing stimulators		X				1,6	
13	25	Optical instrumentation	X					1,6	4
13	26	Homework 7. Designing optical instrumentation		X				1,6	
14	27	Review	X					1,6	4
14	28	Presentation of Instrumentation Specification		X				1,6	
Subtotal 1								44,8	56
Total 1 (Hours of class plus student homework hours between weeks 1-14)									
15		Tutorials, handing in, etc						7	
16		Assessment						3	
17									
18									
Subtotal 2								3	
Total 2 (Hours of class plus student homework hours between weeks 15-18)									
TOTAL A (Total 1 + Total 2)								111	

LABORATORIES CLASSES PROGRAMMING (*)

WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
	1	Laboratory practice 1 s1: Lab. Instrumentation			1,6	
	2	Laboratory practice 1 s2: Lab. Instrumentation (Body potential recordings)			1,6	1
	3	Laboratory practice 2 s1: Build your own ECG			1,6	2
	4	Laboratory practice 2 s2: Build your own ECG			1,6	1
	5	Laboratory practice 2 s3: Build your own ECG			1,6	1
	6	Laboratory practice 2 s4: Build your own ECG			1,6	1
	7	Laboratory practice 3 s1: Blood pressure			1,6	2
	8	Laboratory practice 3 s2: Muscle activity, Temperature			1,6	1
	9	Laboratory practice 5: Elective, part 1			1,6	2
	10	Laboratory practice 6: Elective, part 2			1,6	2
Subtotal 3					16	13
Total 3 (Hours of class plus student homework hours of ten sessions laboratories)					29	
TOTAL B (Total 3)					29	
TOTAL (Total A + Total B. Maximum 180 hours)					140	

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