Universidad Carlos III de Madrid
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COURSE: Instrumentation and multimodality imaging		
DEGREE: Biomedical Engineering	**YEAR: 2025/2026**	**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	1	Introduction	X					1,6	
1	2	X-Ray production / Interaction of radiation and matter	X					1,6	
2	3	Conventional Radiology	X					1,6	
2	4	Practical session - Spectrum		X				1,6	4
3	5	Special X-ray Systems	X					1,6	
3	6	Practical session – Simulator		X				1,6	4
4	7	Radiation detectors: X-ray and NM I	X					1,6	
4	8	Practical session – Dual Energy		X				**1,6**	4
5	9	Radiation detectors: X-ray and NM II & Computed Tomography	X					1,6	

5	10	Tomographic reconstruction in projective systems	X						
6	11	Radioactivity and Radionuclide production and detection	X					1,6	
6	12	Planar imaging in NM	X					1,6	
7	13	Tomography in NM: PET-SPECT	X					1,6	
7	14	Practical session – Attenuation correction		X				1,6	4
8	15	MRI: Physical principles I	X					1,6	
8	16	MRI: Physical principles II	X					1,6	
9	17	MRI: Instrumentation		X				1,6	4
9	18	MRI: Sequences I	X					1,6	
10	19	MRI: Localization and reconstruction I	X					1,6	
10	20	MRI: Localization and reconstruction II		X				1,6	4
11	21	MRI: Imaging sequences	X					1,6	
11	22	MRI: Practical with real system		X				1,6	
12	23	MRI: Practical session - reconstruction		X				1,6	4
12	24	MRI: Other sequences and artifacts		X				1,6	
13	25	Ultrasound: Physical principles	X					1,6	4
13	26	Ultrasound: Instrumentation		X				1,6	
14	27	Ultrasound systems		X				1,6	
14	28	TUTORSHIP		X				1,6	
			ONLINE				**Subtotal 1**	**44,8**	**32**

Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	76,8

TOTAL A *(Total 1 + Total 2)*	**76,8**

LABORATORIES CLASSES PROGRAMMING (*)						
WEEK	SESSION	DESCRIPTION	LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
				DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
	1	X-ray	BiiG laboratories, 7.2.H31		3	4
	2	CT	BiiG laboratories, 1.0.G14		3	4
	3	MRI	HGGM hospital		3	4
	4	US	BiiG laboratories, 1.0.G13		2	2
				Subtotal 3	**11**	**14**
			Total 3 *(Hours of class plus student homework hours of seven sessions laboratories)*		**25**	
			TOTAL B *(Total 3)*		**25**	
TOTAL *(Total A + Total B. Maximum 180 hours)*					**101,8**	

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