COURSE: PHOTONICS TECHNOLOGY II (6 ECTS)		
MASTER: Master in Photonics Engineering	**YEAR: 2017-2018**	**TERM: 1st**

WEEKLY PLANNING

SESSION	DESCRIPTION	GROUPS (mark X)		Special room for session (computer classroom, audio-visual classroom…)	WEEKLY PROGRAMMING FOR STUDENT		
		LECTURES	SEMINARS/ LAB[1]		DESCRIPTION	CLASS HOURS	HOMEWORK HOURS
1	**1.Introduction**	X			Introduction to the subject.	1,5	6
2	**2.1 Fundamentals of laser amplification I.** Interaction Photons-Atoms. Backbody Radiation Spectrum. Luminescence and Scattering.	X			Previous reading and revision of class materials.	1,5	
3	**2.2 Fundamentals of laser amplification II.** Theory of Laser Amplification. Pumping schemes.	X			Previous reading and revision of class materials.	1,5	
4	**2.3 Fundamentals of laser amplification III.** Common Laser Amplifiers. Gain Saturation.	X			Previous reading and revision of class materials.	1,5	12
5	**3.1 Optical fiber amplifiers I.** Erbium Doped Fiber Amplifiers	X			Previous reading and revision of class materials.	1,5	
6	**3.2 Optical fiber amplifiers II.** Raman Amplifiers.	X			Previous reading and revision of class	1,5	

	Amplifier Noise.				materials.		
7	**Exercises**		x		Revision of theoretical concepts and proposed exercises	1,5	
8	**4.1 Emission characteristics of continuous and pulsed lasers I.** Theory of laser oscillation	X			Revision of previous class materials. Previous reading of lab guide.	1,5	
9	**4.2 Emission characteristics of continuous and pulsed lasers II.** Characteristics of laser output	X			Previous reading and revision of class materials.	1,5	16
10	**4.3 Emission characteristics of continuous and pulsed lasers III.** Common laser materials	X			Previous reading and revision of class materials.	1,5	
11	**4.4 Emission characteristics of continuous and pulsed lasers IV.** Pulsed Lasers. Mode-locked lasers. Second Harmonic Generation and Optical Frequency Conversion.	X			Previous reading and revision of class materials.	1,5	
12	**Exercises**		x		Revision of theoretical concepts and proposed exercises	1,5	
13	**5.1 Optical Semiconductor Sources I.** Semiconductor materials	X			Previous reading and revision of class materials.	1,5	
14	**5.2 Optical Semiconductor Sources II. p-n junctions.** Quantum Wells and Quantum Dots. Gain and recombination in semiconductors	X			Previous reading and revision of class materials.	1,5	
15	**5.3 Optical Semiconductor Sources III.** Light Emitting Devices	X			Previous reading and revision of class materials.	1,5	
16	**5.4 Optical Semiconductor Sources IV.** Semiconductor Optical Amplifiers	X			Previous reading and revision of class materials.	1,5	
17	**5.5 Optical Semiconductor Sources V.** Semiconductor Lasers	X			Previous reading and revision of class materials.	1,5	8

18	**Exercises**		X		Previous reading and revision of class materials.	1,5	
19	**Optoelectronic instruments**: power meter, OTDR, OSA		X		Preparation of the laboratory sessions	1,5	
20	**Laboratory Session P1**: Introduction. P-I characteristics of LEDs and LDs		x		Previous reading and revision of class materials.	1,5	
21	**6.1 Electro-optic devices I.** Electro-optic effect and materials	X			Previous reading and revision of class materials.	1,5	
22	**6.2 Electro-optic devices II.** Optical modulators and Spatial Light Modulators	X			Previous reading and revision of class materials.	1,5	
23	**7. Acousto- and Magento-optic devices.** Acousto-optic effect, materials and devices. Magneto-optic effect and materials. Isolators, Circulators and Switches.	X			Previous reading and revision of class materials.	1,5	
24	**Exercises**		x		Revision of theoretical concepts and proposed exercises	1,5	
25	**Laboratory Session P2**: Characterization of EDFAs		x		The students will perform the measurements and compare them with theoretical predictions	1,5	16
26	**Laboratory Session P3**: Characterization of Spectral Properties of LEDs and Laser Diodes		x		The students will perform the measurements and compare them with theoretical predictions	1,5	
27	**Laboratory Session P4**: Characterization of Modulation Properties of LEDs and Laser Diodes		x		The students will perform the measurements and compare them with theoretical predictions	1,5	
28	**Laboratory Session P5**: Characterization of electro-, acousto-, and magneto-optic devices		x		The students will perform the measurements and compare them with theoretical predictions	1,5	
					Subtotal 1	**42**	**68**
	Total 1 *(Hours of class plus student homework hours between weeks 1-14)*					**110**	

[1] **A maximum of 3-4 lab sessions**

	Tutorials, handing in, etc				Solving any remaining question	20

29	Assessment				Studying the documentation for the final assessment.	3	17
					Subtotal 2	**3**	**37**
					Total 2 *(Hours of class plus student homework hours at week 15)*	**40**	

TOTAL *(Total 1 + Total 2)*	**150**