COURSE: ADVANCED SEMICONDUCTOR LASERS (3 ECTS)		
MASTER: Master in Photonics Engineering	**YEAR: 2020-2021**	**TERM: 2nd**

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	INTRODUCTION of the subject. **Review of semiconductor laser fundamentals I.** p-n junctions. Gain in bulk and QWs. Vertical and lateral waveguides.	x			Introduction to the subject.	1,5	4
2	**Review of semiconductor laser fundamentals II.** Fabry-Perot lasers. Threshold condition. Emission characteristics.	x			Previous reading and revision of class materials..	1,5	
3	**Single-frequency laser diodes I.** Bragg Gratings. DBR lasers	x			Previous reading and revision of class materials.	1,5	10
4	**Single-frequency laser diodes II.** Distribute feedback lasers	x			Previous reading and revision of class materials.	1,5	
5	**Single-frequency laser diodes III.** Discrete mode lasers.	x			Previous reading and revision of class materials.	1,5	

6	**Single-frequency laser diodes IV.** Vertical Cavity Surface Emitting lasers.	x			Previous reading and revision of class materials.	1,5	20
7	**Tunable laser diodes I.** External cavity lasers.	x			Previous reading and revision of class materials.	1,5	
8	**Tunable laser diodes II.** Multisection DBR lasers.	X			Previous reading and revision of class materials.	1,5	
9	**Laboratory Session**: Characterization of emission linewidth		x		The students will perform the measurements and compare them with theoretical predictions	1,5	
10	**Narrow Linewidth lasers.** Noise in laser diodes. Emission linewidth.	x			Previous reading and revision of class materials.	1,5	
11	**Laboratory Session:** Characterization of emission linewidth		x		The students will perform the measurements and compare them with theoretical predictions	1,5	
12	**High Power laser diodes I.** Broad Area Lasers. Laser bars. Laser stacks.	x			Previous reading and revision of class materials.	1,5	
13	**High Power laser diodes II.** Tapered lasers. Master Oscillator Power Amplifiers.	x			Presentation and discussion of the student's works.	1,5	
14	**Applications of advanced semiconductor lasers.** Performances and numerical examples		x		Selection of lasers for application examples and discussion	1,5	
					Subtotal 1	**21**	**34**
					Total 1 *(Hours of class plus student homework hours between weeks 1-7)*	**55**	

[1] **A maximum of 1-2 lab sessions**

	Tutorials, handing in, etc				Solving any remaining question	10	
15	Assessment				Studying the documentation for the final assessment.	3	7
					Subtotal 2	**3**	**17**
					Total 2 *(Hours of class plus student homework hours at week 8)*	**20**	

TOTAL *(Total 1 + Total 2)*	**75**