uc3m

COURSE: INTRODUCTION TO QUANTUM COMMUNICATIONS AND COMPUTING		
DEGREE: GICME, GISI, GITT, GIT	**YEAR: 4th**	**TERM: 2nd**

COURSE PLANNING

WEEK	SESSION	DESCRIPTION	GROUP		Indicate if a different lecture room is needed	SESSION WITH 2 LECTURERS	STUDENT'S WORK		
			LARGE	SMALL			DESCRIPTION	CLASS HOURS	OUT-OF-CLASS WORK HOURS
1	1	**Unit 1. Introduction: bits versus qubits** - What is a qubit? - Quantum states	X			NO	Review theory	1,66	3
2	2	**Unit 1. Introduction: bits versus qubits** - Experiments and quantum systems	X			NO	Recommended reading	1,66	4
3	3	**Unit 2. Axioms of quantum mechanics** - Principles of quantum mechanics - Combining systems: quantum entanglement	X			NO	Review the mathematical background in linear algebra	1,66	4
4	4	**Unit 2. Axioms of quantum mechanics** - Experiment: Bell's inequality	X			NO	Recommended reading	1,66	4
5	5	**Unit 2. Axioms of quantum mechanics** - Time and evolution of a system	X			NO	Review theory	1,66	4
6	6	**Unit 2. Axioms of quantum mechanics** - Examples and exercises	X		Computer room	NO	Solve the practical assignment	1,66	4
7	7	**Unit 3. Quantum communications** - Modeling quantum channels	X			NO	Review theory	1,66	4
8	8	**Unit 3. Quantum communications** - Classical versus quantum information	X			NO	Review theory	1,66	4
9	9	**Unit 3. Quantum communications** - Polarization and entanglement	X		Computer room	NO	Solve the practical assignment	1,66	4
10	10	**Unit 3. Quantum communications** - Lab: Secure link Alice-Bob-Eve	X		Computer room	NO	Recommended reading and report delivery	1,66	4
11	11	**Unit 4. Quantum computing** - Resources and tasks - Teleportation	X		Computer room	NO	Solve the practical assignment	1,66	4

12	12	**Unit 4. Quantum computing** - Protocol: entanglement distribution	X		Computer room	NO	Solve the practical assignment	1,66	4
13	13	**Unit 4. Quantum computing** - Protocol: super-dense coding	X		Computer room	NO	Solve the practical assignment	1,66	4
14	14	**Unit 4. Quantum computing** - Quantum computing: state of the art	X			NO	Recommended reading	1,66	4
							Subtotal 1	**23,33**	**55**
		Total 1 *(Hours of student work in weeks 1-14)*						**78,33**	
15		Session recovery, tutor sessions, report deliveries…						1,66	10
							Subtotal 2	**1,66**	**10**
		Total 2 *((Hours of student work in weeks 15-18)*						**11,66**	
TOTAL *(Total 1 + Total 2)*								**90**	