Universidad Carlos III de Madrid

SUBJECT: Omic Technologies in Biomedicine		
MASTER DEGREE: MASTER IN BIOMEDICAL TECHNOLOGIES MANAGEMENT AND DEVELOPMENT	ECTS: 5.0	QUARTER: 1

TIMETABLE FOR THE SUBJECT

WEEK	SESSION	DESCRIPTION OF EACH SESSION	GROUP (X mark)		Indicate if a different lecture room is needed (computer, audiovisual, etc.)	HOMEWORK PER WEEK		
			1	2		DESCRIPTION	ATTENDING HOURS	HOMEWORK Max. 7H/WEEK
1	1 (16 sept)	Introduction to the course and continuous evaluation work. Introduction to omic technologies I. Definition, general characteristics. Omic approach to the actual challenges in biomedicine.	X				1.5	1.5
1	2 (21 sept)	Introduction to omic technologies II. Gene Ontology. Exercises.	X		Computer practice		1.5	1.5
2	3 (23 sept)	Genomics I. Instrumentation. Sanger sequencing. NGS I, common characteristics to all NGS.	X				1.5	1.5
2	4 (28 sept)	Genomics II. Instrumentation. NGS II. Massive parallel sequencing methodologies (different platforms).	X				1.5	1.5
3	5 (30 sept)	Genomics III. Analysis of sequencing data quality. Read length, coverage, allignment (FastQC).	X		Computer practice		1.5	1.5
3	6 (05 oct)	Genomics. Debate: POC devices for sequencing	X				1.5	1.5

4	7 (07 oct)	Genomics IV. Exercises in genomic databases	**X**		Computer Practice		1.5	1.5
4	8 (14 oct)	Metagenomics seminar	**X**				1.5	1.5
5	9 (19 oct)	Functional genomics I. Instrumentation. One/two cannel microarrays, genotyping, CGH. Real time qPCR. Massive RNA sequencing (RNA-Seq).	**X**				1.5	1.5
5	10 (21 oct)	Functional genomics II. Transcriptomic data quality analysis (arrayQualitymetrics)	**X**		Computer practice		1.5	1.5
6	11 (26 oct)	Functional genomics III. Transcriptomic RNA-Seq data analysis exercises.	**X**		Computer room		1.5	1.5
6	12 (28 oct)	Seminar: Massive Transcriptomic Data Analysis for cancer genes	**X**				1.5	1.5
7	13 (04 nov)	Continuous evaluation exam	**X**				1.5	1.5
7	14 (09 nov)	Proteomics I. Separation techniques in proteomics and metabolomics: chromatography, bidimensional and capillary electrophoresis, flow cytometry	**X**				1.5	1.5
8	15 (11 nov)	Proteomics and Metabolomics II. Instrumentation. Mass spectrometry coupling(LC-MS, GC-MS y CE-MS). Mass spectrometers (MALDI-TOF, FTICR).	**X**				1.5	1.5

8	16 (16 nov)	Metabolomics III. Instrumentation. Nuclear Magnetic Resonance (NMR). Quantitative measurements	**X**				1.5	1.5
9	17 (18 nov)	Metabolomics IV. MS data quality analysis in metabolomics.	**X**		Computer room		1.5	1.5
9	18 (23 nov)	Metabolomics IV. MS data quality analysis in metabolomics.	**X**		Computer room		1.5	1.5
10	19 (25 nov)	Omic data integration (multi-omics). What is all these data for. Conclusions.	**X**				1.5	1.5
10	20 (30 nov)	Foodomics seminar	**X**				1.5	1.5
11	21 (02 dic)	Microbiome seminar	**X**				1.5	1.5
11	22 (09 dic)	Conclusions, and biomedical applications	**X**				1.5	1.5
12	23 (14 dic)	Project presentations/Experimental design of omic solutions to biomedical problems	**X**				1	3.5
12	24 (16 dic)	Project presentations/Experimental design of omic solutions to biomedical problems	**X**				1	3.5

		Exam preparation, tutorships, work group…	**X**					50
TOTAL HOURS							35	90