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	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	Introduction to omic technologies II. Gene Ontology. Exercises.	X		Computer room		1.5	1.5
2	3	Genomics I. Instrumentation. Sanger sequencing. NGS I, common characteristics to all NGS.	X				1.5	1.5
2	4	Genomics II. Instrumentation. NGS II. Massive parallel sequencing methodologies (different platforms).	X				1.5	1.5
3	5	Genomics III. Analysis of sequencing data quality. Read length, coverage, allignment (FastQC).	X		Computer room		1.5	1.5
3	6	Genomics IV. Genomic databases exercises.	X		Computer room		1.5	1.5

4	7	Visit to a Sequencing center (CBM)	**X**				1.5	1.5
4	8	Visit to a Sequencing center (CBM)	**X**				1.5	1.5
5	9	Metagenomics seminar	**X**				1.5	1.5
5	10	Functional genomics I. Instrumentation. One/two cannel microarrays, genotyping, CGH. Real time qPCR. Massive RNA sequencing (RNA-Seq).	**X**				1.5	1.5
6	11	Functional genomics II. Transcriptomic data quality analysis (arrayQualitymetrics)	**X**		Computer room		1.5	1.5
6	12	Functional genomics III. Genomic/Transcriptomic data analysis exercises.	**X**		Computer room		1.5	1.5
7	13	Continuous evaluation exam	**X**				1.5	1.5
7	14	Proteomics I. Separation techniques in proteomics and metabolomics: chromatography, bidimensional and capillary electrophoresis, flow cytometry	**X**				1.5	1.5
8	15	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	Metabolomics II. MS data quality analysis in metabolomics.	**X**		Computer room		1.5	1.5
9	17	Proteomics III. MS data quality analysis in proteomics.	**X**		Computer room		1.5	1.5
9	18	Metabolomics III. Instrumentation. Nuclear Magnetic Resonance (NMR). Quantitative measurements	**X**				1.5	1.5
10	19	Metabolomics IV. Quality data analysis in NMR	**X**				1.5	1.5
10	20	Foodomics seminar	**X**				1.5	1.5
11	21	Fluxomics seminar	**X**				1.5	1.5
11	22	Interactomics. Omic data integration (multi-omics). What is all these data for. Conclusions.	**X**				1.5	1.5
12	23	Project presentations/Experimental design of omic solutions to biomedical problems	**X**				1	3.5
12	24	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