

**MASTER'S DEGREE IN STATISTICS AND OPERATIONS RESEARCH
(MESIO UPC-UB)
Curriculum (effective since 2013)**

MESIO UPC-UB is aimed at:

- **Graduates of the Degree in Statistics**, both to guide their future work with companies or institutions that need professionals in statistics and operations research and those with interests in a scientific / academic preparation for a PhD program.
- **Graduates of other disciplines** (mainly Economics and Social Sciences, Engineering, Mathematics, Computer Sciences, Biology and Health Sciences) providing skills and basic knowledge of the discipline that enable them to use the tools and quantitative techniques in statistics and operations research in their profession, each within its scope.

The MESIO UPC-UB distinguishes two pathways from the start of the studies:

- The **Pathway 1** is basically designed for students that come from the Statistics and Mathematics Grades.
- The **Pathway 2** is contemplated for the other students.

The MESIO UPC-UB is a master of 90 credits* (ECTS) distributed in the following way:

- 10 compulsory credits
- 10 compulsory credits pathway 1 or 10 compulsory credits pathway 2
- 40 optional credits
- 30 master's thesis credits

** 1 credit corresponds to 25 hours of student involvement (approximately). All courses are 5 credits (125 hours dedication), with a duration of one semester (3 hours per week of teaching).*

The elective part of the Master is divided into 4 blocks:

Common training	2 subjects
Fundamentals in Statistics	6 subjects
Fundamentals in Operation Research	4 subjects
Specialties:	
• BUSINESS AND SOCIAL STATISTICS	8 subjects
• BIOSTATISTICS AND BIOINFORMATICS	7 subjects
• OPERATIONS RESEARCH	2 subjects
• DATA SIENCE	2 subjects

The attached table shows the subjects that are usually taught and the corresponding semester of instruction. For more detail, visit www.fme.upc.edu

TABLE OF MESIO UPC-UB MODULES, MATERIALS AND SUBJECTS

MODULES			MATERIAALS AND SUBJECTSS				
MODULE ACRONIM	MODULE NAME	CREDITS	MATERIAL CODE	MATERIAL NAME	CREDITS	SUBJECTS	SEMESTER
FOBLIG	COMPULSORY TRAINING	10	FO01	SOFTWARE AND TOOLS OF STATISTICS AND OPERATIONS RESEARCH	10	Software for Statistics and Optimization	Q1
						Models and Methods of Oerations Research	Q2
	COMPULSORY TRAINING PATHWAY 1	10	FO05	PROBABILITY AND STOCHASTIC PROCESSES	5	Probability and Stochastic Processes	Q1
						FO03	ADVANCED STATISTICAL INFERENCE
	COMPULSORY TRAINING PATHWAY 2	10	FO02	FUNDAMENTALS OF STATISTICAL INFERENCE	5	Foundations of Statistical Inference	Q1
FO04						MULTIVARIANTE ANALYSIS	5
FCOM	COMMON TRAINING	10	FC01	MATHEMATICS	5	Mathematics	Q1
			FC02	SIMULATION	5	Simulation	Q1
FEST	FUNDAMENTALS OF STATISTICS	25	FE01	APPLIED MODELLING	10	Lifetime Data Analysis	Q1
						Time Series	Q2
			FE02	ADVANCED MODELLING	15	Bayesian Analysis	Q2
						Linear Model and Generalized Linear Model	Q2
					Longitudinal Data Analysis	Q2	
FIO	FUNDAMENTALS OF OPERATIONS RESEARCH	15	FIO01	FUNDAMENTALS OF OPERATIONS RESEARCH	5	Continuous optimization	Q1
			FIO02	MODELS AND ADVANCED ALGORITHMS	10	Stochastic optimization	Q2
						Large scale optimization	Q2

EMP	BUSINESS AND SOCIAL STATISTICS	40	E01	QUANTIFICATION AND RISK ANALYSIS	10	Actuarial Statistics	Q2
						Risk Quantification	Q1
			E02	QUANTITATIVE MANAGEMENT METHODS	15	Quantitative Marketing Techniques	Q1
						Statistics for Business Management	Q1
						Simulation for Business Decision Making	Q2
			E03	ECONOMIC AND SOCIAL STATISTICS	10	Social Indicators	Q2
						Econometric Analysis	Q1
			E04	FINANCIAL STATISTICS	5	Financial Statistics	Q2
BIO	BIOSTATISTICS AND BIOINFORMATICS	35	B01	ADVANCED TOPICS IN BIOSTATISTICS	15	Clinical Trials	Q1
						Advanced Experimental Design in Clinical Research	Q2
						Advanced Topics in Survival Analysis	Q2
			B02	BIOINFORMATICS	10	Foundations of Bioinformatics	Q1
						Omics Data analysis	Q2
			B03	ADVANCED TOPICS IN EPIDEMIOLOGY	10	Epidemiology	Q2
Spatial Epidemiology	Q1						
IO	APPLICATIONS OF OPERATIONS RESEARCH	10	IO01	APPLICATIONS OF OPERATIONS RESEARCH	10	Discrete Network Models	Q1
						Optimization in Data Science	Q2
DS	DATA SCIENCE	10	DS01	DATA SCIENCE	10	Statistical Learning	Q1
						Statistical Programming and Data Bases	Q2
TFM	MASTER THESIS	30	OB	TFM	30	Master Thesis	Q3