



Sapienza University of Rome  
Faculty of Mathematical, Physical and Natural Sciences

**Courses taught in English**  
version 1.0 – a. y. 2023/2024

**DISCLAIMERS:**

This document changes regularly to adapt to changes in the teaching catalog, hence:

- Always double-check the official study plan of each course (all links to which are listed in the document) which contains also all exams descriptions.
- Check the following page to make sure that this version of the document is as recent as possible: [web.uniroma1.it/fac\\_smfn/incomings](http://web.uniroma1.it/fac_smfn/incomings)
- Always ask your academic coordinators about the relevance of exams and programs.
- If you still have questions about specific courses – after reading the exam description – you can ask to our faculty's coordinators and supervisors: [web.uniroma1.it/fac\\_smfn/facsmfn/international/coordinators-and-academic-supervisors](http://web.uniroma1.it/fac_smfn/facsmfn/international/coordinators-and-academic-supervisors)

**RULES FOR YOUR LEARNING AGREEMENT:**

- 1) You can choose teachings of this faculty from as many different degree programs as you want, even some from bachelor's degrees and some from master's degrees.
- 2) If you want to include teachings from other faculties in your Learning Agreement, the latter must not exceed 50% of the total number of ECTS.

**MSc Physics – Fisica (year 2023/2024)**Course Code: 32384 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10599908	INTRODUCTION TO QUANTUM FIELD THEORY	6	1
1055344	CONDENSED MATTER PHYSICS	6	1
1055349	PHYSICS LABORATORY I	6	1
10599951	GROUP THEORY IN MATHEMATICAL PHYSICS	6	1
1055356	COMPUTING METHODS FOR PHYSICS	6	1
10606101	GENERAL RELATIVITY	6	1
1055358	QUANTUM FIELD THEORY	6	1
10606105	PHENOMENOLOGY OF THE STANDARD MODEL	6	1
10592577	COLLIDER PARTICLE PHYSICS	6	1
10599909	NEUTRINOS AND DARK MATTER	6	1
1055363	EXPERIMENTAL GRAVITATION	6	1
1044548	MEDICAL APPLICATIONS OF PHYSICS	6	1
1055362	ASTROPARTICLE PHYSICS	6	1
10592578	SOLID STATE SENSORS	6	1
10593225	STATISTICAL MECHANICS AND CRITICAL PHENOMENA	6	1
10592732	SOFT AND BIOLOGICAL MATTER	6	1
10592734	NONLINEAR AND QUANTUM OPTICS	6	1
10592567	MANY BODY PHYSICS	6	1
10596040	PHYSICS OF SOLIDS	6	1
10592568	PHYSICS OF COMPLEX SYSTEMS	6	1
1055353	SURFACE PHYSICS AND NANOSTRUCTURES	6	1
10592570	SUPERCONDUCTIVITY AND SUPERFLUIDITY	6	1
10592733	QUANTUM INFORMATION AND COMPUTATION	6	1
1044544	STATISTICAL MECHANICS OF DISORDERED SYSTEMS	6	1
10606100	THEORY OF STOCHASTIC PROCESSES	6	1
10593051	COMPUTATIONAL BIOPHYSICS	6	1
10606103	THEORY OF FUNDAMENTAL INTERACTIONS	6	2
10592564	PARTICLE PHYSICS	6	2
10589922	PHYSICS LABORATORY II	9	2
10596041	CONDENSED MATTER PHYSICS II	6	2
10592572	THEORETICAL BIOPHYSICS	6	2
1055361	BIOPHYSICS	6	2
10592574	NEURAL NETWORKS	6	2
10606102	GRAVITATIONAL WAVES, COMPACT STARS, AND BLACK HOLES	6	2
1044601	PHYSICAL COSMOLOGY	6	2

10606104	STRONG INTERACTIONS AND QCD	6	2
10592576	DETECTORS AND ACCELERATORS IN PARTICLE PHYSICS	6	2
1055355	METHODS IN EXPERIMENTAL PARTICLE PHYSICS	6	2
1055354	NUCLEAR PHYSICS	6	2
1051393	PLASMA PHYSICS AND NUCLEAR FUSION	6	2
1042011	ACCELERATOR PHYSICS AND RELATIVISTIC ELECTRODYNAMICS	6	2
1041749	LASER FUNDAMENTALS	6	2
1042012	OPTICS	6	2
10611918	ADVANCED MACHINE LEARNING FOR PHYSICS	6	2
1044819	PHYSICS OF LIQUIDS	6	2
10592565	PHOTONICS	6	2
1055684	SPECTROSCOPY METHODS AND NANOPHOTONICS	6	2
1055351	COMPUTER ARCHITECTURE FOR PHYSICS	6	2
1055348	MATHEMATICAL PHYSICS	6	2
10592735	NONLINEAR WAVES AND SOLITONS	6	2
1044546	MOLECULAR BIOLOGY	6	2

### **MSc Exploration Geology – Geologia di esplorazione (year 2023/2024)**

Course Code: 30862 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10589732	GEOLOGY OF DIAMONDS	6	1
10600015	EARTHQUAKE PHYSICS	6	2

### **MSc Genetics and Molecular Biology – Genetica e Biologia Molecolare (year 2023/2024)**

Course Code: 28700 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
1051853	CELL CYCLE	6	1
1051858	GENE THERAPY	6	1
1051864	MOLECULAR METHODS	6	1
1051860	METHODS IN HUMAN GENETICS	6	1
10592823	MOLECULAR MECHANISM OF PLANT DEVELOPMENT	6	1
1051866	PHARMACOLOGY IN DRUG DISCOVERY	6	1
1051862	MOLECULAR AND CELLULAR PHYSIOLOGY	6	1
1051865	MOLECULAR ONCOLOGY	6	1

1051862	PSYCHOBIOLOGY WITH ELEMENTS OF PSYCHOPHARMACOLOGY	6	2
1051868	STRUCTURE, BIOSYNTHESIS AND ANALYSIS OF PROTEINS	6	2
1051859	HUMAN GENETICS	6	2
1051861	INTRACELLULAR TRAFFICKING	6	2
1051863	MOLECULAR BIOLOGY OF STEM CELLS	6	2
1051931	DATA ANALYSIS	6	2
10589662	COMPUTATION METHODS IN BIOLOGY	6	2
10598569	BIOCHEMICAL BIOTECHNOLOGIES I	6	2
10611803	PROGRAMMING AND MACHINE LEARNING FOR BIOLOGICAL DATA	6	2

### **MSc Biochemistry – Biochimica (year 2023/2024)**

Course Code: 31179 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10598561	BIOORGANIC CHEMISTRY	6	1
10598562	CELLULAR BIOCHEMISTRY	12	1
10598564	STRUCTURE AND FUNCTION OF MACROMOLECULES	9	1
10598565	MICROORGANISM AND PLANT BIOCHEMISTRY	6	1
10598570	BIOCHEMICAL BIOTECHNOLOGIES II	6	1
10598571	ETHICAL AND REGULATORY ASPECTS OF SCIENTIFIC RESEARCH	6	1
10598572	BIOPHYSICAL CHEMISTRY	6	1
10598577	ENZYME KINETICS	6	1
10598575	NANOTECHNOLOGIES	6	1
10598578	MEDICINAL CHEMISTRY	6	1
10598573	BIOCHEMICAL AND MOLECULAR DIAGNOSTIC	6	1
10598579	NUTRITIONAL BIOCHEMISTRY AND FOOD BIOTECHNOLOGY	6	1
10598581	SUSTAINABLE CROP PROTECTION	6	1
10598580	BIOTECHNOLOGY APPLIED TO ENVIRONMENTAL REMEDIATION	6	1
10598566	PHYSIOPATHOLOGY AND PHARMACOLOGY	9	2
10598567	BIOINFORMATICS AND DATA HANDLING	9	2
10598568	BIOCHEMICAL METHODOLOGIES	9	2
10598569	BIOCHEMICAL BIOTECHNOLOGIES I	6	2

**MSc Mathematics – Matematica (year 2023/2024)**Course Code: 30056 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10605831	ADVANCED TOPICS IN ANALYSIS	6	1
10605830	FOURIER ANALYSIS	6	1
10605751	STOCHASTIC CALCULUS AND APPLICATIONS	6	1
10605832	ADVANCED TOPICS IN GEOMETRY	6	1
1047622	CRYPTOGRAPHY	6	1

**MSc Archeological Materials Science – Scienza dei Materiali Archeologici (year 2023/2024)**Course Code: 30388 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10592319	MEGALITHIC CULTURE	6	1
10596380	ENVIRONMENTAL AND EXPERIMENTAL ARCHAEOLOGY	9	1
10596472	BIOLOGICAL AND PHYSICAL METHODS IN ARCHAEOLOGICAL MATERIALS SCIENCE	9	1
10592327	ROMAN ARCHAEOLOGY	6	1
10596292	BASIC ASPECTS OF SCIENCE APPLIED TO ARCHAEOOMETRY	6	2
10596404	EXCAVATION METHODS CULTURE AND CONTEXTS IN ARCHAEOLOGY	6	1
10596378	DIGITAL TECHNIQUES AND LABORATORY PRACTICE IN ARCHAEOLOGICAL MATERIALS SCIENCE	6	2
10596294	PREVENTIVE CONSERVATION OF ARCHAEOLOGICAL SITES	6	2
10596381	SMART MATERIALS FOR CONSERVATION IN ARCHAEOLOGY	6	1
10592329	HUMAN BIOARCHAEOLOGY	6	1
10596382	GIS AND STATISTICAL TOOLS IN ARCHAEOLOGICAL SCIENCES	6	1
AAF1920	LINGUISTIC SKILLS APPLIED TO ARCHAEOOMETRY	3	2
10592321	GREEK ARCHAEOLOGY	6	2
10596476	ADVANCED SCIENTIFIC METHODS IN ARCHAEOOMETRY	9	2
10596293	ARCHMAT SUMMER SCHOOL	6	2

**MSc Applied Mathematics – Matematica applicata (year 2023/2024)**Course Code: 30860 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10605751	STOCHASTIC CALCULUS AND APPLICATIONS	6	1
10605830	FOURIER ANALYSIS	6	1
10605832	ADVANCED TOPICS IN GEOMETRY	6	1
10605752	MATHEMATICAL MODELS FOR NEURAL NETWORKS	6	1
10605831	ADVANCED TOPICS IN ANALYSIS	6	1
10605748	COMBINATORICS	6	1
1047622	CRYPTOGRAPHY	6	1
10605747	COMPUTATIONAL MATHEMATICS	6	2

**MSc Biotechnology and Genomics for the industry and the environment –  
Biotecnologie e Genomica per l'industria e l'ambiente (year 2023/2024)**Course Code: 32383 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10611995	FOOD SYSTEM RE-THINKING	6	1
10611947	NANOBIOTECHNOLOGY	6	2
10611980	AGRICULTURAL GENETIC AND PLANT BREEDING	6	2
10611979	PHYTOPATHOLOGICAL BIOTECHNOLOGY	6	2
10612050	PLANTS SOLUTIONS FOR CLIMATE CHANGE	6	2

**MSc Astronomy and Astrophysics – Astronomia e Astrofisica (year 2023/2024)**Course Code: 30060 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10606101	GENERAL RELATIVITY	6	1
1051847	ASTROPHYSICS LABORATORY	6	1
1044551	OBSERVATIONAL COSMOLOGY	6	1
1044550	METHODS OF SPACE ASTROPHYSICS	6	1
10611919	COMPUTING METHODS FOR ASTROPHYSICS	6	1
1055362	ASTROPARTICLE PHYSICS	6	1
1055363	EXPERIMENTAL GRAVITATION	6	1
1044601	PHYSICAL COSMOLOGY	6	2
1044553	THEORETICAL ASTROPHYSICS	6	2
10606102	GRAVITATIONAL WAVES COMPACT STARS AND BLACK HOLES	6	2
10606347	HIGH ENERGY ASTROPHYSICS	6	2

10589158	PLANETS AND EXOPLANETS	6	2
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**MSc Science and Technology for the Conservation of Cultural Heritage – Scienze e Tecnologie per la Conservazione dei Beni Culturali** (year 2023/2024)

Course Code: 28702 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10600330	PLANT BIOLOGY AND CONSERVATION FOR CULTURAL HERITAGE	9	1
10600331	APPLIED GEOSCIENCES AND BIOCONSERVATION LABORATORY	9	1
1055897	ORGANIC CHEMISTRY AND DYES	6	1
10589750	GEOMATERIALS FOR CULTURAL HERITAGE	6	1
1052224	THE BIOARCHAEOLOGY OF FOOD	6	1
10600287	CLIMATE RISK ASSESSMENT OF CULTURAL HERITAGE	6	1
1052225	INTRODUCTION TO THESIS AND PRACTICAL SEMINARS	6	1
10600329	ARCHAEOOMETRY AND LABORATORY OF ARCHAEOOMETRY	6	1
10606866	HUMAN PALAEOBIOLOGY AND BIOARCHEOLOGY	6	1
AAF1782	ENGLISH-ITALIAN FOR CULTURAL HERITAGE	3	2
10596265	ADVANCED CHEMICAL METHODS IN ARCHAEOLOGICAL MATERIALS SCIENCE	6	2
10596273	ADVANCED PHYSICAL METHODS APPLIED TO CULTURAL HERITAGE	6	2
10596255	ADVANCED BIOLOGICAL METHODS APPLIED TO CULTURAL HERITAGE	6	2
1051833	GEOPHYSICS APPLIED TO CULTURAL HERITAGE	6	2
1051834	EXPERIMENT AND EXPERIENCE IN ARCHAEOLOGY	6	2
10589715	STONE TOOL TECHNOLOGY LABORATORY	6	2

**MSc Biology and Cellular Technologies – Biologia e Tecnologie Cellulari** (year 2023/2024)

Course Code: 30052 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
10600068	MOLECULAR PLANT PATHOLOGY: THE MAIN STRATEGIES OF INTEGRATED PEST MANAGEMENT	6	1
10606402	THE SCIENTIFIC METHOD AND ITS APPLICATIONS IN BIOLOGY	6	1
10600071	MOLECULAR DYNAMICS IN PLANT-MICROBE INTERACTIONS: THE STUDY OF PLANT-MICROBE INTERACTIONS TO DEVELOP BIOTECHNOLOGICAL	6	2

	APPROACHES FOR CROP IMPROVEMENT		
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### MSc Neurobiology - Neurobiologia (year 2023/2024)

Course Code: 28701 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
1052232	NEUROPHARMACOLOGY OF MOTIVATIONAL PROCESSES	6	1
10598575	NANOTECHNOLOGIES	6	1
1055713	NEUROBIOLOGY OF MEMORY	6	2
1051931	DATA ANALYSIS	6	2
10611804	EVOLUTIONARY ORIGINS OF HUMAN BEHAVIOR:A COMPARATIVE PERSPECTIVE	6	2
10611803	PROGRAMMING AND MACHINE LEARNING FOR BIOLOGICAL DATA	6	2
10592808	NEUROPSYCHOPHARMACOLOGY	6	2
10592805	PSYCHOBIOLOGY WITH ELEMENTS OF PSYCHOPHARMACOLOGY	6	2

### BCs Bioinformatics - Bioinformatica (year 2023/2024)

Course Code: 30422 – Double check on the [study plan](#)

Cod	Name	ECTS	Semester
1049371	PRINCIPLES OF MATHEMATICS I	6	1
1049372	ORGANIC AND INORGANIC CHEMISTRY I	6	1
1049253	PRINCIPLES OF COMPUTER SCIENCE I	6	1
1049373	BIOLOGY OF THE CELL I	6	1
10596081	PRINCIPLES OF PHYSICS	6	1
1052115	GENETICS AND COMPUTATIONAL GENOMICS	6	1
1049261	PRINCIPLES OF COMPUTER SCIENCE II	6	1
1049256	MICROBIOLOGY	6	1
1049375	MOLECULAR BIOLOGY I	6	1
1049377	BIOCHEMISTRY I	6	1
1049266	BIOINFORMATICS II	6	1
1049265	BIOETHICS	6	1
1049258	MOLECULAR BIOLOGY AND GENOMICS	6	1
1049270	COMPLEX BIOMOLECULAR NETWORKS	6	1
1049271	PLANT FUNCTIONAL GENOMICS	6	1
1049272	PRINCIPLES OF GENERAL PATHOLOGY	6	1
1049273	OPTIMIZATION METHODS FOR COMPUTATIONAL	6	1



	BIOLOGY		
1049285	BIOINFORMATICS IN PLANT PATHOLOGY	6	1
1049371	PRINCIPLES OF MATHEMATICS II	6	2
1049372	ORGANIC AND INORGANIC CHEMISTRY II	6	2
1049376	INTRODUCTION TO BIOMEDICAL STATISTICS	12	2
1049373	BIOLOGY OF THE CELL I	6	2
1049375	MOLECULAR BIOLOGY II	6	2
1049377	BIOCHEMISTRY II	6	2
1049260	IMMUNOLOGY AND MOLECULAR PATHOLOGIES	6	2
1049264	PHARMACEUTICAL CHEMISTRY	6	2
10592707	BIOINFORMATICS I	6	2
1049268	SIGNAL PROCESSING AND INFORMATION THEORY	6	2
1049269	ALGORITHMS	6	2