

# Strategic Innovation for Sustainable and Smart Ecosystems - 42<sup>nd</sup> cycle

| course                                                                               | SSD        | Type of activity  | language | hrs | credits | year of attendance | final test | optional/<br>mandatory | track       |
|--------------------------------------------------------------------------------------|------------|-------------------|----------|-----|---------|--------------------|------------|------------------------|-------------|
| METODI PER LA RICERCA I/ RESEARCH METHODS I                                          | SPS/09     | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| METODI PER LA RICERCA II/RESEARCH METHODS II                                         | SECS-S/01  | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| METODI PER LA RICERCA III/RESEARCH METHODS III                                       | ING-INF/05 | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| COMPRENDERE L'INNOVAZIONE /UNDERSTANDING INNOVATION                                  | SECS-P/08  | lesson            | English  | 16  | 2       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| GESTIONE DELL'INNOVAZIONE SOSTENIBILE/ MANAGING SUSTAINABLE INNOVATION               | GEO/02     | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| DISUGUAGLIANZA SOCIALE & GIUSTIZIA SOCIALE I/ SOCIAL INEQUALITY & SOCIAL JUSTICE I   | SPS/01     | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| DISUGUAGLIANZA SOCIALE & GIUSTIZIA SOCIALE II/ SOCIAL INEQUALITY & SOCIAL JUSTICE II | SPS/01     | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | mandatory              | all tracks  |
| PUBLIC MANAGEMENT                                                                    | ECON-06    | lesson (seminars) | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | optional               | TRACK 3     |
| INNOVATION MANAGEMENT & ENTREPRENEURSHIP                                             | SECS-P/08  | lesson            | English  | 32  | 4       | 1 <sup>st</sup>    | YES        | optional               | TRACK 3     |
| SOCIAL MEDIA ANALYTICS                                                               | INF/01     | laboratory        | English  | 12  | 1       | 1 <sup>st</sup>    | YES        | optional               | TRACK 1     |
| EXPLAINABLE AI FOR BUSINESS VALUE                                                    | INF/01     | laboratory        | English  | 12  | 1       | 1 <sup>st</sup>    | YES        | optional               | TRACK 1     |
| SCIENTIFIC COMPUTING WITH PYTHON                                                     | ING-INF/01 | lesson            | English  | 16  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 2     |
| INTRODUCTION TO PLASMA BOUNDARY IN FUSION DEVICES                                    | PHYS/01    | lesson            | English  | 16  | 2       | 2 <sup>nd</sup>    | YES        | optional               | TRACK 2     |
| DEEP LEARNING FOR PHYSICISTS                                                         | INFO-01/A  | lesson            | English  | 16  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 2     |
| ADVANCED PLASMA PHYSICS: WAVE IN INHOMOGENEOUS PLASMA AND KINETIC DESCRIPTION        | PHYS/03    | lesson            | English  | 16  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 2     |
| RECENT DEVELOPMENTS IN PLASMA PHYSICS                                                | PHYS-03/A  | lesson (seminars) | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | optional               | TRACK 2     |
| DEEP LEARNING FOR PHYSICISTS B                                                       | INFO-01/A  | lesson            | English  | 16  | 2       | 2 <sup>nd</sup>    | YES        | optional               | TRACK 2     |
| NON LINEAR EXCITATION FOR IMAGING TECHNIQUES                                         | PHYS-03/A  | lesson            | English  | 8   | 1       | 1 <sup>st</sup>    | YES        | optional               | TRACK 2     |
| OPTIMIZATION METHODS                                                                 | INF/01     | lesson/laboratory | English  | 20  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 1 - 2 |
| DESIGN OF EXPERIMENTS                                                                | INF/01     | lesson            | English  | 16  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 1 - 2 |
| EFFICIENT ALGORITHMS                                                                 | INF/01     | lesson            | English  | 16  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 1 - 2 |
| FOUNDATIONAL MODELS                                                                  | INF/01     | lesson/laboratory | English  | 20  | 2       | 1 <sup>st</sup>    | YES        | optional               | TRACK 1 - 2 |

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| MACHINE LEARNING PARADIGMS                                                                                                                        | INF/01                     | lesson/laboratory | English         | 20 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 1 - 2   |
| PERFORMANCE EVALUATION AND DATA CENTRIC AI                                                                                                        | INF/01                     | lesson            | English         | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 1 - 2   |
| PRINCIPLES OF ELECTRON MICROSCOPY AND APPLICATIONS TO NANOMATERIALS RESEARCH                                                                      | FIS/03                     | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| THE ROLE OF INORGANIC SYSTEMS IN FORMULATIONS : CHEMISTRY INSIGHTS AND APPLICATIONS                                                               | CHIM/03                    | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| INTRODUCTION TO MACHINE LEARNING                                                                                                                  | INF/01                     | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 1-2     |
| ADVANCED THERAPIES, PROGNOSTIC AND DIAGNOSTIC BIOMARKERS IN CANCER DISEASES                                                                       | BIO/12                     | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| ENTREPRENEURSHIP, TT, INNOVATION AND IP MANAGEMENT                                                                                                | CHIM/06                    | lesson            | Italian/English | 8  | 1 | 2 <sup>nd</sup> | YES | optional | TRACK 1-2-3-4 |
| DRUG DISCOVERY: FROM BENCH TO MARKET                                                                                                              | CHIM/06                    | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| SOCIAL RESEARCH DESIGN                                                                                                                            | SPS/07                     | lesson            | English         | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| CURRENT DEBATES IN SOCIAL SCIENCE                                                                                                                 | SPS/07                     | lesson            | English         | 32 | 4 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| ANTROPOLOGIA, SOCIETA' CIVILE E MONDO DEL LAVORO                                                                                                  | M-DEA/01                   | lesson            | English         | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| METODOLOGIA DELLA RICERCA ETNOGRAFICA                                                                                                             | M-DEA/01                   | lesson            | English         | 32 | 4 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| PEDAGOGICAL ISSUES IN EDUCATIONAL RESEARCH                                                                                                        | M-PED/02 M-PED/01 M-PED/03 | lesson            | English         | 40 | 5 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| METHODOLOGICAL ISSUES IN EDUCATIONAL RESEARCH                                                                                                     | M-PED/01 M-PED/03          | lesson            | English         | 32 | 4 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| NANOTECNOLOGIE BIOMEDICHE E TERAPIE AVANZATE / BIOMEDICAL NANOTECHNOLOGIES AND ADVANCED THERAPIES                                                 | BIO/10                     | lesson (seminars) | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| NAVIGARE NELLA LETTERATURA SCIENTIFICA: CRITERI CHIAVE PER UNA ANALISI CRITICA / READING OF SCIENTIFIC PAPERS: TOP TIPS FOR A CRITICAL NAVIGATION | BIO/14                     | lesson (seminars) | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 1-2-3-4 |
| PIANIFICAZIONE E CONDUZIONE DI UNO STUDIO CLINICO / PLANNING AND CONDUCTION OF A CLINICAL STUDY                                                   | MED/41                     | lesson (seminars) | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| PATIENT-DERIVED IN VITRO GLIOMA MODELS: FROM PATIENTS TO DISH TO 3D BIOPRINTING TECHNOLOGY.                                                       | MED/03                     | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| THE POLLUTED BRAIN: THE AIR WE BREATHE, THE BRAIN WE HAVE                                                                                         | BIO/09 - FISIOLOGIA        | lesson            | English         | 8  | 1 | 3 <sup>rd</sup> | YES | optional | TRACK 4       |
| THE PRINCIPLE OF 3R IN BIOMEDICAL STUDIES                                                                                                         | BIO/17                     | lesson            | English         | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| IN VIVO IMAGING FOR ANIMAL MODELS OF DISEASE AND PATIENTIS                                                                                        | MED/50                     | lesson            | English         | 8  | 1 | 2 <sup>nd</sup> | YES | optional | TRACK 4       |
| COMMUNICATION OF CLIMATE CHANGE                                                                                                                   | GEO/12                     | lesson            | English         | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| SCANNING AND TRANSMISSION ELECTRON MICROSCOPY, PRINCIPLES AND APPLICATIONS                                                                        | GEO/06                     | lesson            | English         | 28 | 3 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| MACHINE LEARNING FOR MULTIVARIATE DATA ANALYSIS                                                                                                   | CHIM/01                    | lesson            | English         | 20 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| OPEN-SOURCE SOFTWARE FOR SPATIAL DATA ANALYSIS                                                                                                    | GEO/04                     | lesson            | English         | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 2       |

|                                                                  |                                    |                   |         |    |   |                 |     |          |               |
|------------------------------------------------------------------|------------------------------------|-------------------|---------|----|---|-----------------|-----|----------|---------------|
| TIME SERIES ANALYSIS OF ENVIRONMENTAL DATA                       | GEO/05                             | lesson (seminars) | English | 20 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| NMR SPECTROSCOPY APPLICATIONS TO LIGAND-RECEPTOR STUDIES         | CHIM/06                            | laboratory        | English | 20 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 2       |
| LEGAL RESEARCH METHOD                                            | IUS/13 IUS/20                      | lesson            | English | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| METHODS AND TECHNIQUES IN URBAN AND REGIONAL STUDIES             | SPS/08 SPS/10<br>M-GGR/01 M-DEA/01 | lesson            | English | 32 | 4 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| URBAN-REGIONAL ISSUES AND POLICY                                 | SPS/10 SPS/07<br>SPS/08            | lesson            | English | 64 | 8 | 1 <sup>st</sup> | YES | optional | TRACK 3       |
| BASICS OF VR/AR HUMAN-COMPUTER INTERACTIONS                      | M-PSI/01                           | lesson            | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 3-4     |
| NEURAL NETWORKS IN COGNITIVE SCIENCE                             | M-PSI/01                           | lesson            | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 3-4     |
| PSYCHOMETRIC NETWORK ANALYSIS                                    | M-PSI/03                           | lesson            | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 3-4     |
| AMBULATORY ASSESSMENT FOR DATA COLLECTION IN NATURAL ENVIRONMENT | M-PSI/08                           | lesson            | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 3-4     |
| UNDERSTANDING THE UI/UX DESIGN PROCESS                           | M-PSI/02<br>ING/INF/05             | lesson            | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 3-4     |
| INTRODUCTION TO PUBLIC HEALTH                                    | MEDS-24B                           | lesson            | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| PUBLIC HEALTH EPIDMIOLOGY                                        | MEDS-24B                           | lesson            | English | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| SURVIVAL ANALYSIS METHODS FOR CLINICAL RESEARCH                  | MEDS-24/A                          | lesson (seminars) | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| ECONOMIC EVALUATIONS OF HEALTHCARE PROGRAMMES                    | MEDS-24B                           | lesson (seminars) | English | 16 | 2 | 1 <sup>st</sup> | YES | optional | TRACK 4       |
| SYSTEMATIC REVIEWS                                               | MEDS-24B                           | lesson (seminars) | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 1-2-3-4 |
| HEALTH SERVICES ORGANIZATION                                     | MEDS-24B                           | lesson (seminars) | English | 8  | 1 | 2 <sup>nd</sup> | NO  | optional | TRACK 4       |
| BURDEN OF DISEASE                                                | MEDS-24B                           | lesson (seminars) | English | 8  | 1 | 3 <sup>rd</sup> | NO  | optional | TRACK 4       |
| HEALTH ECONOMICS                                                 | GSPS-02/A                          | lesson (seminars) | English | 24 | 3 | 1 <sup>st</sup> | NO  | optional | TRACK 4       |
| STATISTICAL MEHTODS FOR HEALTH SERVICES AND SYSTEMS ASSESSMENT   | STAT-03/B                          | lesson (seminars) | English | 8  | 1 | 1 <sup>st</sup> | YES | optional | TRACK 4       |

TRACK 1 - Innovation of Processes  
 TRACK 2 - Innovation of Products  
 TRACK 3 - Innovation in Society & Organizations  
 TRACK 4 - Innovation and Welfare