ALLEGATO 1

Social Sciences and Humanities

**SH1 Individuals, Markets and Organisations:** Economics, finance and management

- **SH1_1** Macroeconomics; monetary economics; economic growth
- **SH1_2** International trade; international business; international management; spatial economics
- **SH1_3** Financial economics; monetary economics
- **SH1_4** Financial economics; banking; corporate finance; international finance; accounting; auditing; insurance
- **SH1_5** Labour and demographic economics; human resource management
- **SH1_6** Econometrics; operations research
- **SH1_7** Behavioural economics; experimental economics; neuro-economics
- **SH1_8** Microeconomics; game theory
- **SH1_9** Industrial organisation; strategy; entrepreneurship
- **SH1_10** Management; marketing; organisational behaviour; operations management
- **SH1_11** Technological change, innovation, research & development
- **SH1_12** Agricultural economics; energy economics; environmental economics
- **SH1_13** Public economics; political economics; law and economics
- **SH1_14** Quantitative economic history; institutional economics; economic systems

**SH2 Institutions, Values, Environment and Space:** Political science, law, sustainability science, geography, regional studies and planning

- **SH2_1** Political systems, governance
- **SH2_2** Democratisation and social movements
- **SH2_3** Conflict resolution, war
- **SH2_4** Legal studies, constitutions, human rights, comparative law
- **SH2_5** International relations, global and transnational governance
- **SH2_6** Sustainability sciences, environment and resources
- **SH2_7** Environmental and climate change, societal impact and policy
- **SH2_8** Energy, transportation and mobility
- **SH2_9** Urban, regional and rural studies
- **SH2_10** Land use and regional planning
- **SH2_11** Human, economic and social geography
- **SH2_12** GIS, spatial analysis; big data in political, geographical and legal studies

**SH3 The Social World, Diversity, Population:** Sociology, social psychology, demography, education, communication

- **SH3_1** Social structure, social mobility
- **SH3_2** Inequalities, discrimination, prejudice, aggression and violence, antisocial behaviour
SH3_3 Social integration, exclusion, prosocial behavior
SH3_4 Attitudes and beliefs
SH3_5 Social influence; power and group behaviour; classroom management
SH3_6 Diversity and identities, gender, interethnic relations
SH3_7 Social policies, welfare
SH3_8 Population dynamics; households, family and fertility
SH3_9 Health, ageing and society
SH3_10 Social aspects of learning, curriculum studies, educational policies
SH3_11 Communication and information, networks, media
SH3_12 Digital social research
SH3_13 Science and technology studies

**SH4 The Human Mind and Its Complexity:** Cognitive science, psychology, linguistics, philosophy of mind

SH4_1 Cognitive basis of human development and education, developmental disorders;
comparative cognition
SH4_2 Personality and social cognition; emotion
SH4_3 Clinical and health psychology
SH4_4 Neuropsychology
SH4_5 Attention, perception, action, consciousness
SH4_6 Learning, memory; cognition in ageing
SH4_7 Reasoning, decision-making; intelligence
SH4_8 Language learning and processing (first and second languages)
SH4_9 Theoretical linguistics; computational linguistics
SH4_10 Language typology
SH4_11 Pragmatics, sociolinguistics, discourse analysis
SH4_12 Philosophy of mind, philosophy of language
SH4_13 Philosophy of science, epistemology, logic

**SH5 Cultures and Cultural Production:** Literature, philology, cultural studies, anthropology, study of the arts, philosophy

SH5_1 Classics, ancient literature and art
SH5_2 Theory and history of literature, comparative literature
SH5_3 Philology and palaeography; historical linguistics
SH5_4 Visual and performing arts, film, design
SH5_5 Music and musicology; history of music
SH5_6 History of art and architecture, arts-based research
SH5_7 Museums, exhibitions, conservation and restoration
SH5_8 Cultural studies, cultural identities and memories, cultural heritage
SH5_9 Social anthropology, religious studies, symbolic representation
SH5_10 Metaphysics, philosophical anthropology; aesthetics
SH5_11 Ethics; social and political philosophy
SH5_12 History of philosophy
SH5_13 Computational Modelling and Digitisation in the Cultural Sphere
**SH6 The Study of the Human Past: Archaeology and History**

SH6_1 Historiography, Theory and methods in history, including the analysis of digital data
SH6_2 Classical archaeology, history of archaeology
SH6_3 General archaeology, archaeometry, landscape archaeology
SH6_4 Prehistory, palaeoanthropology, palaeodemography, protohistory
SH6_5 Ancient history
SH6_6 Medieval history
SH6_7 Early modern history
SH6_8 Modern and contemporary history
SH6_9 Colonial and post-colonial history
SH6_10 Global history, transnational history, comparative history, entangled histories
SH6_11 Social and economic history
SH6_12 Gender history; Cultural History; History of Collective Identities and Memories
SH6_13 History of Ideas, Intellectual History, history of economic thought
SH6_14 History of Science, Medicine and Technologies
Physical Sciences and Engineering

**PE1 Mathematics:** All areas of mathematics, pure and applied, plus mathematical foundations of computer science, mathematical physics and statistics

- PE1_1 Logic and foundations
- PE1_2 Algebra
- PE1_3 Number theory
- PE1_4 Algebraic and complex geometry
- PE1_5 Geometry
- PE1_6 Topology
- PE1_7 Lie groups, Lie algebras
- PE1_8 Analysis
- PE1_9 Operator algebras and functional analysis
- PE1_10 ODE and dynamical systems
- PE1_11 Theoretical aspects of partial differential equations
- PE1_12 Mathematical physics
- PE1_13 Probability
- PE1_14 Statistics
- PE1_15 Discrete mathematics and combinatorics
- PE1_16 Mathematical aspects of computer science
- PE1_17 Numerical analysis
- PE1_18 Scientific computing and data processing
- PE1_19 Control theory and optimisation
- PE1_20 Application of mathematics in sciences
- PE1_21 Application of mathematics in industry and society

**PE2 Fundamental Constituents of Matter:** Particle, nuclear, plasma, atomic, molecular, gas, and optical physics

- PE2_1 Fundamental interactions and fields
- PE2_2 Particle physics
- PE2_3 Nuclear physics
- PE2_4 Nuclear astrophysics
- PE2_5 Gas and plasma physics
- PE2_6 Electromagnetism
- PE2_7 Atomic, molecular physics
- PE2_8 Ultra-cold atoms and molecules
- PE2_9 Optics, non-linear optics and nano-optics
- PE2_10 Quantum optics and quantum information
- PE2_11 Lasers, ultra-short lasers and laser physics
- PE2_12 Acoustics
- PE2_13 Relativity
- PE2_14 Thermodynamics
- PE2_15 Non-linear physics
- PE2_16 General physics
- PE2_17 Metrology and measurement
- PE2_18 Statistical physics (gases)
**PE3 Condensed Matter Physics:** Structure, electronic properties, fluids, nanosciences, biophysics

PE3_1 Structure of solids and liquids
PE3_2 Mechanical and acoustical properties of condensed matter, Lattice dynamics
PE3_3 Transport properties of condensed matter
PE3_4 Electronic properties of materials, surfaces, interfaces, nanostructures, etc.
PE3_5 Semiconductors and insulators: material growth, physical properties
PE3_6 Macroscopic quantum phenomena: superconductivity, superfluidity, etc.
PE3_7 Spintronics
PE3_8 Magnetism and strongly correlated systems
PE3_9 Condensed matter – beam interactions (photons, electrons, etc.)
PE3_10 Nanophysics: nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics, etc.
PE3_11 Mesoscopic physics
PE3_12 Molecular electronics
PE3_13 Structure and dynamics of disordered systems: soft matter (gels, colloids, liquid crystals, etc.), glasses, defects, etc.
PE3_14 Fluid dynamics (physics)
PE3_15 Statistical physics: phase transitions, noise and fluctuations, models of complex systems, etc.
PE3_16 Physics of biological systems

**PE4 Physical and Analytical Chemical Sciences:** Analytical chemistry, chemical theory, physical chemistry/chemical physics

PE4_1 Physical chemistry
PE4_2 Spectroscopic and spectrometric techniques
PE4_3 Molecular architecture and Structure
PE4_4 Surface science and nanostructures
PE4_5 Analytical chemistry
PE4_6 Chemical physics
PE4_7 Chemical instrumentation
PE4_8 Electrochemistry, electrodialysis, microfluidics, sensors
PE4_9 Method development in chemistry
PE4_10 Heterogeneous catalysis
PE4_11 Physical chemistry of biological systems
PE4_12 Chemical reactions: mechanisms, dynamics, kinetics and catalytic reactions
PE4_13 Theoretical and computational chemistry
PE4_14 Radiation and Nuclear chemistry
PE4_15 Photochemistry
PE4_16 Corrosion
PE4_17 Characterisation methods of materials
PE4_18 Environment chemistry
PE5 Synthetic Chemistry and Materials: Materials synthesis, structure-properties relations, functional and advanced materials, molecular architecture, organic chemistry

PE5_1 Structural properties of materials
PE5_2 Solid state materials
PE5_3 Surface modification
PE5_4 Thin films
PE5_5 Ionic liquids
PE5_6 New materials: oxides, alloys, composite, organic-inorganic hybrid, nanoparticles
PE5_7 Biomaterials, biomaterials synthesis
PE5_8 Intelligent materials – self assembled materials
PE5_9 Coordination chemistry
PE5_10 Colloid chemistry
PE5_11 Biological chemistry
PE5_12 Chemistry of condensed matter
PE5_13 Homogeneous catalysis
PE5_14 Macromolecular chemistry
PE5_15 Polymer chemistry
PE5_16 Supramolecular chemistry
PE5_17 Organic chemistry
PE5_18 Molecular chemistry
PE5_19 Combinatorial chemistry

PE6 Computer Science and Informatics: Informatics and information systems, computer science, scientific computing, intelligent systems

PE6_1 Computer architecture, pervasive computing, ubiquitous computing
PE6_2 Computer systems, parallel/distributed systems, sensor networks, embedded systems, cyber-physical systems
PE6_3 Software engineering, operating systems, computer languages
PE6_4 Theoretical computer science, formal methods, and quantum computing
PE6_5 Cryptology, security, privacy, quantum crypto
PE6_6 Algorithms, distributed, parallel and network algorithms, algorithmic game theory
PE6_7 Artificial intelligence, intelligent systems, multi agent systems
PE6_8 Computer graphics, computer vision, multimedia, computer games
PE6_9 Human computer interaction and interface, visualisation and natural language processing
PE6_10 Web and information systems, database systems, information retrieval and digital libraries, data fusion
PE6_11 Machine learning, statistical data processing and applications using signal processing (e.g. speech, image, video)
PE6_12 Scientific computing, simulation and modelling tools
PE6_13 Bioinformatics, biocomputing, and DNA and molecular computation

**PE7 Systems and Communication Engineering:** Electrical, electronic, communication, optical and systems engineering

PE7_1 Control engineering
PE7_2 Electrical engineering: power components and/or systems
PE7_3 Simulation engineering and modelling
PE7_4 (Micro and nano) systems engineering
PE7_5 (Micro and nano) electronic, optoelectronic and photonic components
PE7_6 Communication technology, high-frequency technology
PE7_7 Signal processing
PE7_8 Networks (communication networks, sensor networks, networks of robots, etc.)
PE7_9 Man-machine-interfaces
PE7_10 Robotics
PE7_11 Components and systems for applications (in e.g. medicine, biology, environment)
PE7_12 Electrical energy production, distribution, application

**PE8 Products and Processes Engineering:** Product design, process design and control, construction methods, civil engineering, energy processes, material engineering

PE8_1 Aerospace engineering
PE8_2 Chemical engineering, technical chemistry
PE8_3 Civil engineering, architecture, maritime/hydraulic engineering, geotechnics, waste treatment
PE8_4 Computational engineering
PE8_5 Fluid mechanics, hydraulic-, turbo-, and piston engines
PE8_6 Energy processes engineering
PE8_7 Mechanical and manufacturing engineering (shaping, mounting, joining, separation)
PE8_8 Materials engineering (metals, ceramics, polymers, composites, etc.)
PE8_9 Production technology, process engineering
PE8_10 Industrial design (product design, ergonomics, man-machine interfaces, etc.)
PE8_11 Sustainable design (for recycling, for environment, eco-design)
PE8_12 Lightweight construction, textile technology
PE8_13 Industrial bioengineering
PE9 Universe Sciences: Astro-physics/chemistry/biology; solar system; stellar, galactic and extragalactic astronomy, planetary systems, cosmology, space science, instrumentation

PE9_1 Solar and interplanetary physics
PE9_2 Planetary systems sciences
PE9_3 Interstellar medium
PE9_4 Formation of stars and planets
PE9_5 Astrobiology
PE9_6 Stars and stellar systems
PE9_7 The Galaxy
PE9_8 Formation and evolution of galaxies
PE9_9 Clusters of galaxies and large scale structures
PE9_10 High energy and particles astronomy – X-rays, cosmic rays, gamma rays, neutrinos
PE9_11 Relativistic astrophysics
PE9_12 Dark matter, dark energy
PE9_13 Gravitational astronomy
PE9_14 Cosmology
PE9_15 Space Sciences
PE9_16 Very large data bases: archiving, handling and analysis
PE9_17 Instrumentation - telescopes, detectors and techniques

PE10 Earth System Science: Physical geography, geology, geophysics, atmospheric sciences, oceanography, climatology, cryology, ecology, global environmental change, biogeochemical cycles, natural resources management

PE10_1 Atmospheric chemistry, atmospheric composition, air pollution
PE10_2 Meteorology, atmospheric physics and dynamics
PE10_3 Climatology and climate change
PE10_4 Terrestrial ecology, land cover change
PE10_5 Geology, tectonics, volcanology
PE10_6 Palaeoclimatology, palaeoecology
PE10_7 Physics of earth's interior, seismology, volcanology
PE10_8 Oceanography (physical, chemical, biological, geological)
PE10_9 Biogeochemistry, biogeochemical cycles, environmental chemistry
PE10_10 Mineralogy, petrology, igneous petrology, metamorphic petrology
PE10_11 Geochemistry, crystal chemistry, isotope geochemistry, thermodynamics
PE10_12 Sedimentology, soil science, palaeontology, earth evolution
PE10_13 Physical geography
PE10_14 Earth observations from space/remote sensing
PE10_15 Geomagnetism, palaeomagnetism
PE10_16 Ozone, upper atmosphere, ionosphere
PE10_17 Hydrology, water and soil pollution
PE10_18 Cryosphere, dynamics of snow and ice cover, sea ice, permafrosts and ice sheets
**Life Sciences**

**LS1 Molecular and Structural Biology and Biochemistry:** Molecular synthesis, modification and interaction, biochemistry, biophysics, structural biology, metabolism, signal transduction

- LS1_1 Molecular interactions
- LS1_2 General biochemistry and metabolism
- LS1_3 DNA synthesis, modification, repair, recombination and degradation
- LS1_4 RNA synthesis, processing, modification and degradation
- LS1_5 Protein synthesis, modification and turnover
- LS1_6 Lipid synthesis, modification and turnover
- LS1_7 Carbohydrate synthesis, modification and turnover
- LS1_8 Biophysics (e.g. transport mechanisms, bioenergetics, fluorescence)
- LS1_9 Structural biology (crystallography and EM)
- LS1_10 Structural biology (NMR)
- LS1_11 Biochemistry and molecular mechanisms of signal transduction

**LS2 Genetics, Genomics, Bioinformatics and Systems Biology:** Molecular and population genetics, genomics, transcriptomics, proteomics, metabolomics, bioinformatics, computational biology, biostatistics, biological modelling and simulation, systems biology, genetic epidemiology

- LS2_1 Genomics, comparative genomics, functional genomics
- LS2_2 Transcriptomics
- LS2_3 Proteomics
- LS2_4 Metabolomics
- LS2_5 Glycomics
- LS2_6 Molecular genetics, reverse genetics and RNAi
- LS2_7 Quantitative genetics
- LS2_8 Epigenetics and gene regulation
- LS2_9 Genetic epidemiology
- LS2_10 Bioinformatics
- LS2_11 Computational biology
- LS2_12 Biostatistics
- LS2_13 Systems biology
- LS2_14 Biological systems analysis, modelling and simulation

**LS3 Cellular and Developmental Biology:** Cell biology, cell physiology, signal transduction, organogenesis, developmental genetics, pattern formation in plants and animals, stem cell biology

- LS3_1 Morphology and functional imaging of cells
- LS3_2 Cell biology and molecular transport mechanisms
- LS3_3 Cell cycle and division
- LS3_4 Apoptosis
- LS3_5 Cell differentiation, physiology and dynamics
- LS3_6 Organelle biology
- LS3_7 Cell signalling and cellular interactions
LS3.8 Signal transduction
LS3.9 Development, developmental genetics, pattern formation and embryology in animals
LS3.10 Development, developmental genetics, pattern formation and embryology in plants
LS3.11 Cell genetics
LS3.12 Stem cell biology

**LS4 Physiology, Pathophysiology and Endocrinology:** Organ physiology, pathophysiology, endocrinology, metabolism, ageing, tumorigenesis, cardiovascular disease, metabolic syndrome

LS4.1 Organ physiology and pathophysiology
LS4.2 Comparative physiology and pathophysiology
LS4.3 Endocrinology
LS4.4 Ageing
LS4.5 Metabolism, biological basis of metabolism related disorders
LS4.6 Cancer and its biological basis
LS4.7 Cardiovascular diseases
LS4.8 Non-communicable diseases (except for neural/psychiatric, immunity-related, metabolism-related disorders, cancer and cardiovascular diseases)

**LS5 Neurosciences and Neural Disorders:** Neurobiology, neuroanatomy, neurophysiology, neurochemistry, neuropharmacology, neuroimaging, systems neuroscience, neurological and psychiatric disorders

LS5.1 Neuroanatomy and neurophysiology
LS5.2 Molecular and cellular neuroscience
LS5.3 Neurochemistry and neuropharmacology
LS5.4 Sensory systems (e.g. visual system, auditory system)
LS5.5 Mechanisms of pain
LS5.6 Developmental neurobiology
LS5.7 Cognition (e.g. learning, memory, emotions, speech)
LS5.8 Behavioural neuroscience (e.g. sleep, consciousness, handedness)
LS5.9 Systems neuroscience
LS5.10 Neuroimaging and computational neuroscience
LS5.11 Neurological disorders (e.g. Alzheimer’s disease, Huntington’s disease, Parkinson’s disease)
LS5.12 Psychiatric disorders (e.g. schizophrenia, autism, Tourette’s syndrome, obsessive compulsive disorder, depression, bipolar disorder, attention deficit hyperactivity disorder)
**LS6 Immunity and Infection:** The immune system and related disorders, infectious agents and diseases, prevention and treatment of infection

- LS6_1 Innate immunity and inflammation
- LS6_2 Adaptive immunity
- LS6_3 Phagocytosis and cellular immunity
- LS6_4 Immunosignalling
- LS6_5 Immunological memory and tolerance
- LS6_6 Immunogenetics
- LS6_7 Microbiology
- LS6_8 Virology
- LS6_9 Bacteriology
- LS6_10 Parasitology
- LS6_11 Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide)
- LS6_12 Biological basis of immunity related disorders (e.g. autoimmunity)
- LS6_13 Veterinary medicine and infectious diseases in animals

**LS7 Diagnostic Tools, Therapies and Public Health:** Aetiology, diagnosis and treatment of disease, public health, epidemiology, pharmacology, clinical medicine, regenerative medicine, medical ethics

- LS7_1 Medical engineering and technology
- LS7_2 Diagnostic tools (e.g. genetic, imaging)
- LS7_3 Pharmacology, pharmacogenomics, drug discovery and design, drug therapy
- LS7_4 Analgesia and Surgery
- LS7_5 Toxicology
- LS7_6 Gene therapy, cell therapy, regenerative medicine
- LS7_7 Radiation therapy
- LS7_8 Health services, health care research
- LS7_9 Public health and epidemiology
- LS7_10 Environment and health risks, occupational medicine
- LS7_11 Medical ethics

**LS8 Evolutionary, Population and Environmental Biology:** Evolution, ecology, animal behaviour, population biology, biodiversity, biogeography, marine biology, ecotoxicology, microbial ecology

- LS8_1 Ecology (theoretical and experimental; population, species and community level)
- LS8_2 Population biology, population dynamics, population genetics
- LS8_3 Systems evolution, biological adaptation, phylogenetics, systematics, comparative biology
- LS8_4 Biodiversity, conservation biology, conservation genetics, invasion biology
- LS8_5 Evolutionary biology: evolutionary ecology and genetics, co-evolution
LS8_6 Biogeography, macro-ecology
LS8_7 Animal behaviour
LS8_8 Environmental and marine biology
LS8_9 Environmental toxicology at the population and ecosystems level
LS8_10 Microbial ecology and evolution
LS8_11 Species interactions (e.g. food-webs, symbiosis, parasitism, mutualism)

**LS9 Applied Life Sciences and Non-Medical Biotechnology:** Applied plant and animal sciences; food sciences; forestry; industrial, environmental and non-medical biotechnologies, bioengineering; synthetic and chemical biology; biomimetics; bioremediation

LS9_1 Non-medical biotechnology and genetic engineering (including transgenic organisms, recombinant proteins, biosensors, bioreactors, microbiology)
LS9_2 Synthetic biology, chemical biology and bio-engineering
LS9_3 Animal sciences (including animal husbandry, aquaculture, fisheries, animal welfare)
LS9_4 Plant sciences (including crop production, plant breeding, agroecology, soil biology)
LS9_5 Food sciences (including food technology, nutrition)
LS9_6 Forestry and biomass production (including biofuels)
LS9_7 Environmental biotechnology (including bioremediation, biodegradation)
LS9_8 Biomimetics
LS9_9 Biohazards (including biological containment, biosafety, biosecurity)