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)