GAMU Keywords

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   Lie groups, Lie algebras

PE1_6   Geometry and global analysis

PE1_7   Topology

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   Theory of fundamental interactions

PE2_2   Phenomenology of fundamental interactions

PE2_3   Experimental particle physics with accelerators

PE2_4   Experimental particle physics without accelerators

PE2_5   Classical and quantum physics of gravitational interactions

PE2_6   Nuclear, hadron and heavy ion physics

PE2_7   Nuclear and particle astrophysics

PE2_8   Gas and plasma physics

PE2_9   Electromagnetism

PE2_10   Atomic, molecular physics

PE2_11   Ultra-cold atoms and molecules

PE2_12   Optics, non-linear optics and nano-optics

PE2_13   Quantum optics and quantum information

PE2_14   Lasers, ultra-short lasers and laser physics

PE2_15   Thermodynamics

PE2_16   Non-linear physics

PE2_17   Metrology and measurement

PE2_18   Equilibrium and non-equilibrium statistical mechanics: steady states and dynamics

PE3   Condensed Matter Physics

Structure, electronic properties, fluids, nanosciences, biological physics

PE3_1   Structure of solids, material growth and characterisation

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

PE3_5   Physical properties of semiconductors and insulators

PE3_6   Macroscopic quantum phenomena, e.g. superconducvity, superfluidity, quantum Hall effect

PE3_7   Spintronics

PE3_8   Magnetism and strongly correlated systems

PE3_9   Condensed matter – beam interactions (photons, electrons, etc.)

PE3_10   Nanophysics, e.g. nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics

PE3_11   Mesoscopic quantum physics and solid-state quantum technologies

PE3_12   Molecular electronics

PE3_13   Structure and dynamics of disordered systems, e.g. soft matter (gels, colloids, liquid crystals), granular matter, liquids, glasses, defects

PE3_14   Fluid dynamics (physics)

PE3_15   Statistical physics: phase transitions, condensed matter systems, models of complex systems, interdisciplinary applications

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

New materials and new synthetic approaches, structure-properties relations, solid state chemistry, molecular architecture, organic chemistry

PE5_1   Structural properties of materials

PE5_2   Solid state materials chemistry

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 synthesis

PE5_8   Intelligent materials synthesis – self assembled materials

PE5_9   Coordination chemistry

PE5_10   Colloid chemistry

PE5_11   Biological chemistry and chemical biology

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   Medicinal chemistry

PE6   Computer Science and Informatics

Informatics and information systems, computer science, scientific computing, intelligent systems

PE6_1   Computer architecture, embedded systems, operating systems

PE6_2   Distributed systems, parallel computing, sensor networks, cyber-physical systems

PE6_3   Software engineering, programming languages and systems

PE6_4   Theoretical computer science, formal methods, automata

PE6_5   Security, privacy, cryptology, quantum cryptography

PE6_6   Algorithms and complexity, distributed, parallel and network algorithms, algorithmic game theory

PE6_7   Artificial intelligence, intelligent systems, natural language processing

PE6_8   Computer graphics, computer vision, multimedia, computer games

PE6_9   Human computer interaction and interface, visualisation

PE6_10   Web and information systems, data management 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, bio-inspired computing, and natural computing

PE6_14   Quantum computing (formal methods, algorithms and other computer science aspects)

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 systems, wireless technology, high-frequency technology

PE7_7   Signal processing

PE7_8   Networks, e.g. communication networks and nodes, Internet of Things, sensor networks, networks of robots

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, applications

PE8   Products and Processes Engineering

Product and process design, chemical, civil, environmental, mechanical, vehicle engineering, energy processes and relevant computational methods

PE8_1   Aerospace engineering

PE8_2   Chemical engineering, technical chemistry

PE8_3   Civil engineering, architecture, offshore construction, lightweight construction, geotechnics

PE8_4   Computational engineering

PE8_5   Fluid mechanics

PE8_6   Energy processes engineering

PE8_7   Mechanical engineering

PE8_8   Propulsion engineering, e.g. hydraulic, turbo, piston, hybrid engines

PE8_9   Production technology, process engineering

PE8_10   Manufacturing engineering and industrial design

PE8_11   Environmental engineering, e.g. sustainable design, waste and water treatment, recycling, regeneration or recovery of compounds, carbon capture & storage

PE8_12   Naval/marine engineering

PE8_13   Industrial bioengineering

PE8_14   Automotive and rail engineering; multi-/inter-modal transport engineering

PE9   Universe Sciences

Astro-physics/-chemistry/-biology; solar system; planetary systems; stellar, galactic and extragalactic astronomy; cosmology; space sciences; astronomical instrumentation and data

PE9_1   Solar physics – the Sun and the heliosphere

PE9_2   Solar system science

PE9_3   Exoplanetary science, formation and characterization of extrasolar planets

PE9_4   Astrobiology

PE9_5   Interstellar medium and star formation

PE9_6   Stars – stellar physics, stellar systems

PE9_7   The Milky Way

PE9_8   Galaxies – formation, evolution, clusters

PE9_9   Cosmology and large-scale structure, dark matter, dark energy

PE9_10   Relativistic astrophysics and compact objects

PE9_11   Gravitational wave astronomy

PE9_12   High-energy and particle astronomy

PE9_13   Astronomical instrumentation and data, e.g. telescopes, detectors, techniques, archives, analyses

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, geodynamics

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, cosmochemistry, crystal chemistry, isotope geochemistry, thermodynamics

PE10_12 Sedimentology, soil science, palaeontology, earth evolution

PE10_13 Physical geography, geomorphology

PE10_14 Earth observations from space/remote sensing

PE10_15 Geomagnetism, palaeomagnetism

PE10_16 Ozone, upper atmosphere, ionosphere

PE10_17 Hydrology, hydrogeology, engineering and environmental geology, water and soil pollution

PE10_18 Cryosphere, dynamics of snow and ice cover, sea ice, permafrosts and ice sheets

PE10_19 Planetary geology and geophysics

PE10_20 Geohazards

PE10_21 Earth system modelling and interactions

PE11   Materials Engineering

Advanced materials development: performance enhancement, modelling, large-scale preparation, modification, tailoring, optimisation, novel and combined use of materials, etc.

PE11_1 Engineering of biomaterials, biomimetic, bioinspired and bio-enabled materials

PE11_2 Engineering of metals and alloys

PE11_3 Engineering of ceramics and glasses

PE11_4 Engineering of polymers and plastics

PE11_5 Engineering of composites and hybrid materials

PE11_6 Engineering of carbon materials

PE11_7 Engineering of metal oxides

PE11_8 Engineering of alternative established or emergent materials

PE11_9 Nanomaterials engineering, e.g. nanoparticles, nanoporous materials, 1D & 2D nanomaterials

PE11_10 Soft materials engineering, e.g. gels, foams, colloids

PE11_11 Porous materials engineering, e.g. covalent-organic, metal-organic, porous aromatic frameworks

PE11_12 Semi-conducting and magnetic materials engineering

PE11_13 Metamaterials engineering

PE11_14 Computational methods for materials engineering

Life Sciences

LS1   Molecules of Life: Biological Mechanisms, Structures and Functions

For all organisms: Molecular biology, biochemistry, structural biology, molecular biophysics, synthetic and chemical biology, drug design, innovative methods and modelling

LS1_1 Macromolecular complexes including interactions involving nucleic acids, proteins, lipids and carbohydrates

LS1_2 Biochemistry

LS1_3   DNA and RNA biology

LS1_4   Protein biology

LS1_5   Lipid biology

LS1_6   Glycobiology

LS1_7   Molecular biophysics, biomechanics, bioenergetics

LS1_8   Structural biology

LS1_9   Molecular mechanisms of signalling processes

LS1_10   Synthetic biology

LS1_11   Chemical biology

LS1_12   Protein design

LS1_13   Early translational research and drug design

LS1_14   Innovative methods and modelling in molecular, structural and synthetic biology

LS2   Integrative Biology: from Genes and Genomes to Systems

For all organisms: Genetics, epigenetics, genomics and other 'omics studies, bioinformatics, systems biology, genetic diseases, gene editing, innovative methods and modelling, 'omics for personalised medicine

LS2_1   Genetics

LS2_2   Gene editing

LS2_3   Epigenetics

LS2_4   Gene regulation

LS2_5   Genomics

LS2_6   Metagenomics

LS2_7   Transcriptomics

LS2_8   Proteomics

LS2_9   Metabolomics

LS2_10   Glycomics/Lipidomics

LS2_11   Bioinformatics and computational biology

LS2_12   Biostatistics

LS2_13   Systems biology

LS2_14   Genetic diseases

LS2_15   Integrative biology for personalised medicine

LS2_16   Innovative methods and modelling in integrative biology

LS3   Cellular, Developmental and Regenerative Biology

For all organisms: Structure and function of the cell, cell-cell communication, embryogenesis, tissue differentiation, organogenesis, growth, development, evolution of development, organoids, stem cells, regeneration, therapeutic approaches

LS3_1   Cell cycle, cell division and growth

LS3_2   Cell senescence, cell death, autophagy, cell ageing

LS3_3   Cell behaviour, including control of cell shape, cell migration

LS3_4   Cell junctions, cell adhesion, the extracellular matrix, cell communication

LS3_5   Cell signalling and signal transduction, exosome biology

LS3_6   Organelle biology and trafficking

LS3_7   Mechanobiology of cells, tissues and organs

LS3_8   Embryogenesis, pattern formation, morphogenesis

LS3_9   Cell differentiation, formation of tissues and organs

LS3_10   Developmental genetics

LS3_11   Evolution of developmental strategies

LS3_12   Organoids

LS3_13   Stem cells

LS3_14   Regeneration

LS3_15   Development of cell-based therapeutic approaches for tissue regeneration

LS3_16   Functional imaging of cells and tissues

LS3_17   Theoretical modelling in cellular, developmental and regenerative biology

LS4   Physiology in Health, Disease and Ageing

Organ and tissue physiology, comparative physiology, physiology of ageing, pathophysiology, inter-organ and tissue communication, endocrinology, nutrition, metabolism, interaction with the microbiome, non-communicable diseases including cancer (and except disorders of the nervous system and immunity-related diseases)

LS4_1   Organ and tissue physiology and pathophysiology

LS4_2   Comparative physiology

LS4_3   Physiology of ageing

LS4_4   Endocrinology

LS4_5   Non-hormonal mechanisms of inter-organ and tissue communication

LS4_6   Microbiome and host physiology

LS4_7   Nutrition and exercise physiology

LS4_8   Impact of stress (including environmental stress) on physiology

LS4_9   Metabolism and metabolic disorders, including diabetes and obesity

LS4_10   The cardiovascular system and cardiovascular diseases

LS4_11   Haematopoiesis and blood diseases

LS4_12   Cancer

LS4_13   Other non-communicable diseases (except disorders of the nervous system and immunity-related diseases)

LS5   Neuroscience and Disorders of the Nervous System

Nervous system development, homeostasis and ageing, nervous system function and dysfunction, systems neuroscience and modelling, biological basis of cognitive processes and of behaviour, neurological and mental disorders

LS5_1   Neuronal cells

LS5_2   Glial cells and neuronal-glial communication

LS5_3   Neural development and related disorders

LS5_4   Neural stem cells

LS5_5   Neural networks and plasticity

LS5_6   Neurovascular biology and blood-brain barrier

LS5_7   Sensory systems, sensation and perception, including pain

LS5_8   Neural basis of behaviour

LS5_9   Neural basis of cognition

LS5_10   Ageing of the nervous system

LS5_11   Neurological and neurodegenerative disorders

LS5_12   Mental disorders

LS5_13   Nervous system injuries and trauma, stroke

LS5_14   Repair and regeneration of the nervous system

LS5_15   Neuroimmunology, neuroinflammation

LS5_16   Systems and computational neuroscience

LS5_17   Imaging in neuroscience

LS5_18   Innovative methods and tools for neuroscience

LS6   Immunity, Infection and Immunotherapy

The immune system, related disorders and their mechanisms, biology of infectious agents and infection, biological basis of prevention and treatment of infectious diseases, innovative immunological tools and approaches, including therapies

LS6_1   Innate immunity

LS6_2   Adaptive immunity

LS6_3   Regulation of the immune response

LS6_4   Immune-related diseases

LS6_5   Biology of pathogens (e.g. bacteria, viruses, parasites, fungi)

LS6_6   Infectious diseases

LS6_7   Mechanisms of infection

LS6_8   Biological basis of prevention and treatment of infection

LS6_9   Antimicrobials, antimicrobial resistance

LS6_10   Vaccine development

LS6_11   Innovative immunological tools and approaches, including therapies

LS7   Prevention, Diagnosis and Treatment of Human Diseases

Medical technologies and tools for prevention, diagnosis and treatment of human diseases, therapeutic approaches and interventions, pharmacology, preventative medicine, epidemiology and public health, digital medicine

LS7_1   Medical imaging for prevention, diagnosis and monitoring of diseases

LS7_2   Medical technologies and tools (including genetic tools and biomarkers) for prevention, diagnosis, monitoring and treatment of diseases

LS7_3   Nanomedicine

LS7_4   Regenerative medicine

LS7_5   Applied gene, cell and immune therapies

LS7_6   Other medical therapeutic interventions, including transplantation

LS7_7   Pharmacology and toxicology

LS7_8   Effectiveness of interventions, including resistance to therapies

LS7_9   Public health and epidemiology

LS7_10   Preventative and prognostic medicine

LS7_11   Environmental health, occupational medicine

LS7_12   Health care, including care for the ageing population

LS7_13   Palliative medicine

LS7_14   Digital medicine, e-medicine, medical applications of artificial intelligence

LS7_15   Medical ethics

LS8   Environmental Biology, Ecology and Evolution

For all organisms: Ecology, biodiversity, environmental change, evolutionary biology, behavioural ecology, microbial ecology, marine biology, ecophysiology, theoretical developments and modelling

LS8_1   Ecosystem and community ecology, macroecology

LS8_2   Biodiversity

LS8_3   Conservation biology

LS8_4   Population biology, population dynamics, population genetics

LS8_5   Biological aspects of environmental change, including climate change

LS8_6   Evolutionary ecology

LS8_7   Evolutionary genetics

LS8_8   Phylogenetics, systematics, comparative biology

LS8_9   Macroevolution and paleobiology

LS8_10   Ecology and evolution of species interactions

LS8_11   Behavioural ecology and evolution

LS8_12   Microbial ecology and evolution

LS8_13   Marine biology and ecology

LS8_14   Ecophysiology, from organisms to ecosystems

LS8_15   Theoretical developments and modelling in environmental biology, ecology, and evolution

LS9   Biotechnology and Biosystems Engineering

Biotechnology using all organisms, biotechnology for environment and food applications, applied plant and animal sciences, bioengineering and synthetic biology, biomass and biofuels, biohazards

LS9_1   Bioengineering for synthetic and chemical biology

LS9_2   Applied genetics, gene editing and transgenic organisms

LS9_3   Bioengineering of cells, tissues, organs and organisms

LS9_4   Microbial biotechnology and bioengineering

LS9_5   Food biotechnology and bioengineering

LS9_6   Marine biotechnology and bioengineering

LS9_7   Environmental biotechnology and bioengineering

LS9_8   Applied plant sciences, plant breeding, agroecology and soil biology

LS9_9   Plant pathology and pest resistance LS9_10   Veterinary and applied animal sciences

LS9_11   Biomass production and utilisation, biofuels

LS9_12   Ecotoxicology, biohazards and biosafety

Social Sciences and Humanities

SH1 Individuals, Markets and Organisations

Economics, finance, management

SH1_1 Macroeconomics; monetary economics; economic growth

SH1_2 International trade; international management; international business; spatial economics

SH1_3 Development economics; structural change; political economy of development

SH1_4 Finance; asset pricing; international finance; market microstructure

SH1_5 Corporate finance; banking and financial intermediation; accounting; auditing; insurance

SH1_6 Econometrics; operations research

SH1_7 Behavioural economics; experimental economics; neuro-economics

SH1_8 Microeconomic theory; game theory; decision theory

SH1_9 Industrial organisation; entrepreneurship; R&D and innovation

SH1_10 Management; strategy; organisational behaviour

SH1_11 Human resource management; operations management, marketing

SH1_12 Environmental economics; resource and energy economics; agricultural economics

SH1_13 Labour and demographic economics

SH1_14 Health economics; economics of education

SH1_15 Public economics; political economics; law and economics

SH1_16 Historical economics; quantitative economic history; institutional economics; economic systems

SH2 Institutions, Governance and Legal Systems

Political science, international relations, law

SH2_1 Political systems, governance

SH2_2 Democratisation and social movements

SH2_3 Conflict resolution, war, peace building, international law

SH2_4 Legal studies, constitutions, human rights, comparative law

SH2_5   International relations, global and transnational governance

SH2_6   Humanitarian assistance and development

SH2_7   Political and legal philosophy

SH2_8   Big data in political and legal studies

SH3   The Social World and Its Diversity

Sociology, social psychology, social anthropology, education sciences, communication studies

SH3_1   Social structure, social mobility, social innovation

SH3_2   Inequalities, discrimination, prejudice

SH3_3   Aggression and violence, antisocial behaviour, crime

SH3_4   Social integration, exclusion, prosocial behaviour

SH3_5   Attitudes and beliefs

SH3_6   Social influence; power and group behaviour

SH3_7   Kinship; diversity and identities, gender, interethnic relations

SH3_8   Social policies, welfare, work and employment

SH3_9   Poverty and poverty alleviation

SH3_10 Religious studies, ritual; symbolic representation

SH3_11 Social aspects of teaching and learning, curriculum studies, education and educational policies

SH3_12 Communication and information, networks, media

SH3_13 Digital social research

SH3_14 Social studies of science and technology

SH4   The Human Mind and Its Complexity

Cognitive science, psychology, linguistics, theoretical philosophy

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; historical linguistics

SH4_11   Pragmatics, sociolinguistics, linguistic anthropology, discourse analysis

SH4_12   Philosophy of mind, philosophy of language

SH4_13   Philosophy of science, epistemology, logic

SH5   Cultures and Cultural Production

Literary studies, cultural studies, study of the arts, philosophy

SH5_1   Classics, ancient literature and art

SH5_2   Theory and history of literature, comparative literature

SH5_3   Philology; text and image studies

SH5_4   Visual and performing arts, film, design and architecture

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   Metaphysics, philosophical anthropology; aesthetics

SH5_10   Ethics and its applications; social philosophy

SH5_11   History of philosophy

SH5_12   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, social archaeology

SH6_3   General archaeology, archaeometry, landscape archaeology

SH6_4   Prehistory, palaeoanthropology, palaeodemography, protohistory, bioarchaeology

SH6_5   Palaeography and codicology

SH6_6   Ancient history

SH6_7   Medieval history

SH6_8   Early modern history

SH6_9   Modern and contemporary history

SH6_10 Colonial and post-colonial history

SH6_11 Global history, transnational history, comparative history, entangled histories

SH6_12 Social and economic history

SH6_13 Gender history, cultural history, history of collective identities and memories, history of religions

SH6_14 History of ideas, intellectual history, history of economic thought

SH6_15 History of science, medicine and technologies

SH7   Human Mobility, Environment, and Space

Human geography, demography, health, sustainability science, territorial planning, spatial analysis

SH7_1   Human, economic and social geography

SH7_2   Migration

SH7_3   Population dynamics: households, family and fertility

SH7_4   Social aspects of health, ageing and society

SH7_5   Sustainability sciences, environment and resources

SH7_6   Environmental and climate change, societal impact and policy

SH7_7   Cities; urban, regional and rural studies

SH7_8   Land use and planning

SH7_9   Energy, transportation and mobility

SH7_10 GIS, spatial analysis; big data in geographical studies