

2011

COMPETITION

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ANIMAL SCIENCES (Code: AS)

Study of animals and animal life, including the study of the structure, physiology, development, and classification of animals. Animal ecology, physiology, animal husbandry, cytology, histology, entomology, ichthyology, ornithology, herpetology, etc.

Subcategories:

- Development
- Ecology
- Animal Husbandry
- Pathology
- Physiology
- Population Genetics
- Systematics

DEV Development - The study of an organism from an egg to birth or hatching.

ECO Ecology - The science of the interactions and relationships among animals and animals and plants with their environments.

HUS Husbandry - The study and practice of breeding and raising livestock.

PATH Pathology - The study of the nature of animal disease and its causes, processes, development, and consequences.

PHY Physiology - The study of the mechanical, physical, and biochemical functions of living organisms.

POP Population Genetics - The study of genetic composition of populations in order to understand the evolutionary forces that select for particular genes.

SYST Systematics - Systematic classification of organisms and the evolutionary relationships among them; taxonomy.

BEHAVIORAL AND SOCIAL SCIENCES (Code: BE)

The science or study of the thought processes and behavior of humans and other animals in their interactions with the environment studied through observational and experimental methods.

Subcategories:

Clinical & Developmental Psychology
Cognitive Psychology
Physiological Psychology
Sociology

CLIN Clinical and Developmental Psychology - The study and treatment of emotional or behavioral disorders. Developmental psychology is concerned with the study of progressive behavioral changes in an individual from birth until death.

COG Cognitive, Brain and Cognition, Neuro-psychology - The study of cognition, the mental processes that underlie behavior, including thinking, deciding, reasoning, and to some extent motivation and emotion. Neuro-psychology studies the relationship between the nervous system, especially the brain, and cerebral or mental functions such as language, memory, and perception.

PHY Physiological Psychology - The study of the biological and physiological basis of behavior.

SOC Sociology and Social Psychology; Industrial/Organizational Psychology - The study of human social behavior, especially the study of the origins, organization, institutions, and development of human society. Sociology is concerned with all group activities-economic, social, political, and religious.

BIOCHEMISTRY (Code: BI)

The study of the chemical substances and vital processes occurring in living organisms, the processes by which these substances enter into, or are formed in, the organisms and react with each other and the environment.

Subcategories:

- General Biochemistry
- Metabolism
- Structural Biochemistry

GEN General Biochemistry - The study of the chemical processes of living organisms.

META Metabolism - The study of the biochemical modification of chemical compounds in living organisms and cells.

STRU Structural Biochemistry - the study of the structures and physical properties of biological molecules, including proteins, carbohydrates, lipids, and nucleic acids; the mechanisms of enzyme action.

CELLULAR AND MOLECULAR BIOLOGY (Code: CB)

The study of the structure and formation of cells.

Subcategories:

- Cellular Biology
- Cellular and Molecular Genetics
- Immunology
- Molecular Biology

CELL Cellular Biology - The study of the organization and functioning of the individual cell.

GENE Genetics - The study of molecular genetics focusing on the structure and function of genes at a molecular level.

IMM Immunology - The study of the structure and function of the immune system, innate and acquired immunity, and laboratory techniques involving the interaction of antigens with antibodies.

MOLE Molecular Biology - The study of biology at the molecular level. Chiefly concerns itself with understanding the interactions between the various systems of a cell, including the interrelationships of DNA, RNA and protein synthesis and learning how these interactions are regulated.

CHEMISTRY (Code: CH)

The science of the composition, structure, properties, and reactions of matter, especially of atomic and molecular systems.

Subcategories:

Analytical Chemistry
General Chemistry
Inorganic Chemistry
Organic Chemistry
Physical Chemistry

ANAL Analytical Chemistry - The science and art of determining composition of materials in terms of the elements and compounds that they contain.

GEN General Chemistry - The science of the composition, structure, properties, and reactions of matter, especially of atomic and molecular systems.

INOR Inorganic Chemistry - The branch of chemistry that deals with reactions and properties of all chemical elements and their compounds, excluding hydrocarbons but usually including carbides and other simple carbon compounds (such as CO₂, CO and HCN.)

ORGA Organic Chemistry - The study of the hydrocarbons and their derivatives, both naturally occurring and synthetic.

PHY Physical Chemistry - Physical chemistry is concerned with the physical properties of materials, such as their electrical and magnetic behavior and their interaction with electromagnetic fields.

COMPUTER SCIENCE (Code: CS)

The study of information processes, the structures and procedures that represent processes, and their implementation in information processing systems. It includes systems analysis and design, application and system software design, programming, and datacenter operations.

Subcategories:

Algorithms, Data Bases
Artificial Intelligence
Networking and Communications
Computational Science, Computer Graphics
Software Engineering, Programming Languages
Computer System, Operating System

ALGO Algorithms, Data Bases - The study of algorithms and databases. Software developed to manage any form of data including text, images, sound and video.

ARTI Artificial Intelligence - The study of the ability of a computer or other machine to perform those activities that are normally thought to require intelligence, such as solving problems, discriminating among objects, and/or responding to voice commands.

NET Networking and Communications - The study of systems that transmits any combination of voice, video, and/or data among users.

SCIE Computational Science, Computer Graphics - The study of the use of computers to perform research in other fields, such as computer simulations. Also includes the study of computer graphics or the transfer of pictorial data into and out of a computer by various means (analog-to-digital, optical scanning, etc).

SOFT Software Engineering, Programming Languages - The study of software designed to control the hardware of a specific data processing system in order to allow users and application programs to make use of it.

SYST Computer System, Operating System - The study of system software responsible for the direct control and management of hardware and basic system operations of a computer.

EARTH AND PLANETARY SCIENCE (Code: EA)

The study of sciences related to the planet Earth (Geology, mineralogy, physiography, oceanography, meteorology, climatology, speleology, seismology, geography, atmospheric sciences, etc.)

Subcategories:

Climatology, Weather
Geochemistry, Mineralogy
Historical Paleontology
Geophysics
Planetary Science
Tectonics

CLIM Climatology, Meteorology, Weather - the scientific study of the atmosphere that focuses on weather processes and forecasting.

GEO Geochemistry, Mineralogy - The study of the chemical composition of the earth and other planets, chemical processes and reactions that govern the composition of rocks and soils. Mineralogy is focused around the chemistry, crystal structure and physical (including optical) properties of minerals.

HIST Historical Paleontology - The study of life in the geologic past as recorded by fossil remains.

PHY Geophysics - Branch of geology in which the principles and practices of physics are used to study the earth and its environment.

PLAN Planetary Science - The study of planets or planetary systems and the solar system.

TECH Tectonics - The study of the earth's structural features as related to plate structure, plate movement, volcanism, etc.

ENGINEERING: Electrical and Mechanical (Code: EE)

The application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, processes, and systems.

Subcategories:

Electrical Engineering, Computer Engineering, Controls
Mechanical Engineering
Robotics
Thermodynamics, Solar

ELEC Electrical Engineering, Computer Engineering, Controls - Electrical engineering is the branch of engineering that deals with the technology of electricity, especially the design and application of circuitry and equipment for power generation and distribution, machine control, and communications. A computer engineer is an electrical engineer with a focus on digital logic systems or a software architect with a focus on the interaction between software programs and the underlying hardware architecture.

MECH Mechanical Engineering - The branch of engineering that encompasses the generation and application of heat and mechanical power and the design, production, and use of machines and tools.

ROB Robotics - The science or study of the technology associated with the design, fabrication, theory, and application of robots and of general purpose, programmable machine systems.

THRM Thermodynamics, Solar - Thermodynamics involves the physics of the relationships and conversions between heat and other forms of energy. Solar is the technology of obtaining usable energy from the light of the sun.

ENGINEERING: Materials and Bioengineering Code: EN)

The application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical machines and systems.

Subcategories:

Bioengineering
Civil Engineering, Construction Engineering
Chemical Engineering
Industrial Engineering, Processing
Material Science

BIO Bioengineering - Involves the application of engineering principles to the fields of biology and medicine, as in the development of aids or replacements for defective or missing body organs; the development and manufacture of prostheses, medical devices, diagnostic devices, drugs and other therapies as well as the application of engineering principles to basic biological science problems.

CHEM Chemical Engineering - Deals with the design, construction, and operation of plants and machinery for making such products as acids, dyes, drugs, plastics, and synthetic rubber by adapting the chemical reactions discovered by the laboratory chemist to large-scale production.

CIVI Civil Engineering, Construction Engineering - Includes the planning, designing, construction, and maintenance of structures and public works, such as bridges or dams, roads, water supply, sewer, flood control and, traffic.

IND Industrial Engineering, Processing - Concerned with efficient production of industrial goods as affected by elements such as plant and procedural design, the management of materials and energy, and the integration of workers within the overall system. The industrial engineer designs methods, not machinery.

MAT Material Science - A multidisciplinary field relating the performance and function of matter in any and all applications to its micro, nano, and atomic structure, and vice versa. It often involves the study of the characteristics and uses of various materials, such as metals, ceramics, and plastics and their potential engineering applications.

ENERGY & TRANSPORTATION (Code: ET)

The study of renewable energy sources, energy efficiency, clean transport, and alternative fuels.

Subcategories:

Aerospace and Aeronautical Engineering, Aerodynamics
Alternative Fuels
Fossil Fuel Energy
Vehicle Development
Renewable Energies

AERO Aerospace and Aeronautical Engineering, Aerodynamics - The design of aircraft and space vehicles and the direction of the technical phases of their manufacture and operation.

ALT Alternative Fuels - Any method of powering an engine that does not involve petroleum (oil). Some alternative fuels are electricity, methane, hydrogen, natural gas, and wood.

FOS Fossil Fuel Energy - Energy from a hydrocarbon deposit, such as petroleum, coal, or natural gas, derived from living matter of a previous geologic time and used for fuel.

VEH Vehicle Development - Engineering of vehicles that operate using energy other than from fossil fuel.

REN Renewable Energies - Renewable energy sources capture their energy from existing flows of energy, from on-going natural processes such as sunshine, wind, flowing water, biological processes, and geothermal heat flows.

ENVIRONMENTAL MANAGEMENT (Code: EM)

The study of managing mans' interaction with the environment.

Subcategories:

Bioremediation
Ecosystems Management
Environmental Engineering
Land Resource Management, Forestry
Recycling, Waste Management

BIO Bioremediation - Biological remediation of environmental problems using plants. The use of biological agents, such as bacteria or plants, to remove or neutralize contaminants, as in polluted soil or water. Includes phytoremediation, constructed wetlands for wastewater treatment, biodegradation, etc.

ECO Ecosystems Management - The integration of ecological, economic, and social principles to manage biological and physical systems in a manner that safeguards the long-term ecological sustainability, natural diversity, and productivity of the landscape. An ecological approach to managing the environment.

ENG Environmental Engineering - The development of processes and infrastructure for the supply of water, the disposal of waste, and the control of pollution. Includes alternative engineering methodologies to meet society's needs in an environmentally sound and sustainable manner. Preservation of the environment by preventing the contamination of, and facilitating the clean up of, air, water, and land resources.

LAND Land Resource Management and Forestry - A landscape approach to sustainable resource management, coastal management, biological diversity management, land use planning, or forest succession management. It often includes a resource planning component as well as implementation methodologies. An example would be the management of longleaf pine forests including controlled burns to imitate natural processes.

REC Recycling and Waste Management - The extraction and reuse of useful substances from discarded items, garbage, or waste. The process of managing, and disposing of, wastes and hazardous substances through methodologies such as landfills, sewage treatment, composting, waste reduction, etc.

ENVIRONMENTAL SCIENCES (Code: EV)

The analysis of existing conditions of the environment.

Subcategories:

Air Pollution and Air Quality
Soil Contamination and Soil Quality
Water Pollution and Water Quality

AIR Air Pollution and Air Quality - The study of contamination of the air by such things as noxious gases, elements, minerals, chemicals, solid and liquid matter (particulates), etc. Air pollution is the study of such contaminants in concentrations that endanger the health of humans, plants, and/or animals.

SOIL Soil Contamination and Soil Quality - The study of contamination of the soil by such things as noxious elements, minerals, chemicals, solids, liquids, etc. Soil contamination is the study of such contaminants in concentrations that endanger the health of humans, plants, and/or animals.

WATE Water Pollution and Water Quality - The study of contamination of the water by such things as noxious elements, minerals, chemicals, solids, etc. Water pollution is the study of such contaminants in concentrations that endanger the health of humans, plants, and/or animals.

MATHEMATICAL SCIENCES (Code: MA)

The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols. The deductive study of numbers, geometry, and various abstract constructs, or structures. Mathematics is very broadly divided into foundations, algebra, analysis, geometry, and applied mathematics, which includes theoretical computer science.

Subcategories:

- Algebra
- Analysis
- Applied Mathematics
- Geometry
- Probability and Statistics

ALG Algebra - The study of solutions of one or several algebraic equations, involving the polynomial functions of one or several variables. This includes the study of arithmetic and number theory.

ANAL Analysis - The study of mathematical analysis involves the use of infinite processes. The basic branch of analysis is calculus. The general problem of measuring lengths, areas, volumes, and other quantities as limits by means of approximating polygonal figures leads to the integral calculus.

COMP Computer/Applied Mathematics - Branch of mathematics that concerns itself with the mathematical techniques typically used in the application of mathematical knowledge to other domains.

GEO Geometry - The study of the shape, size, and other properties of figures and the nature of space.

STAT Probability and Statistics - Mathematical study of phenomena characterized by randomness or uncertainty and the study of statistical tools used to analyze, interpret and present data.

MEDICINE & HEALTH SCIENCES (Code: ME)

The science of diagnosing, treating, or preventing disease and other damage to the body or mind.

Subcategories:

- Disease Diagnosis and Treatment
- Epidemiology
- Genetics
- Molecular Biology of Diseases
- Physiology and Pathophysiology
- Other

DIS Disease Diagnosis and Treatment - The act or process of identifying or determining the nature and cause of a disease or injury through evaluation of patient history, examination, and review of laboratory data. Administration or application of remedies to a patient or for a disease or injury; medicinal or surgical management; therapy.

EPID Epidemiology - The study of the causes, distribution, and control of disease in populations. Epidemiologists, using sophisticated statistical analyses, field investigations, and complex laboratory techniques, investigate the cause of a disease, its distribution (geographic, ecological, and ethnic), method of spread, and measures for control and prevention.

GENE Genetics - The study of heredity, especially the mechanisms of hereditary transmission and the variation of inherited traits among similar or related organisms.

MOLE Molecular Biology of Diseases - The study of diseases at the molecular level.

PHYS Physiology and Pathophysiology - The science of the mechanical, physical, and biochemical functions of normal tissues or organs. Pathophysiology is the study of the disturbance of normal mechanical, physical, and biochemical functions that a disease causes, or that which causes the disease.

MICROBIOLOGY (Code: MI)

The study of micro-organisms, including bacteria, viruses, prokaryotes, and simple eukaryotes and of antibiotic substances.

Subcategories:

Antibiotics, Antimicrobials
Bacteriology
Microbial Genetics
Virology

ANTI Antibiotics, Antimicrobials - The study of methods of destroying or inhibiting the growth of bacteria or other micro-organisms.

BACT Bacteriology - The study of the anatomy, physiology of bacteria and the diseases they cause.

GENE Genetics - The study of genes, heredity and variations of microorganisms

VIRO Virology - The study the anatomy, physiology of viruses and the diseases they cause.

PHYSICS AND ASTRONOMY (Code: PH)

Physics is the science of matter and energy and of interactions between the two. Astronomy is the study of anything in the universe beyond the Earth.

Subcategories:

Atoms, Molecules, Solids

Astronomy

Biological Physics

Instrumentation and Electronics

Magnetics and Electromagnetics

Nuclear and Particle Physics

Optics, Lasers, Masers

Theoretical Physics, Theoretical or Computational Astronomy

AMS Atoms, Molecules and Solids - The study of matter-matter and light-matter interactions on the scale of single atoms or structures containing a few atoms.

ASTRO Astronomy - The study of matter in outer space, especially the positions, dimensions, distribution, motion, composition, energy, and evolution of celestial bodies and phenomena.

BIO Biological Physics - The study of the physics of biological processes.

INST Instrumentation and Electronics - Instrumentation is the process of developing means of precise measurement of various variables such as flow and pressure while maintaining control of the variables at desired levels of safety and economy. Electronics is the branch of physics that deals with the emission and effects of electrons and with the use of electronic devices.

MAG Magnetics and Electromagnetics - Magnetics is the study of magnets and their effects; electromagnetics is the physics of electricity and magnetism.

NUCL Nuclear and Particle Physics - Nuclear physics is the study of the components, structure, and behavior of the nucleus of the atom. It is especially concerned with the nature of matter and with nuclear energy. Particle physics is the study of the elementary constituents of matter and radiation, and the interactions between them.

OPT Optics, Lasers, and Masers - Optics is the study of light and vision, chiefly the generation, propagation, and detection of electromagnetic radiation having wavelengths greater than x-rays and shorter than microwaves. Lasers are devices that emit highly amplified and coherent radiation of one or more discrete frequencies. Masers are devices for the creation, amplification, and transmission of an intense, highly focused beam of high-frequency radio waves.

THEO Theoretical Physics, Theoretical or Computational Astronomy - Theoretical physics employs mathematical models and abstractions rather than experimental processes. Theoretical physics attempts to understand the natural world by making a model of reality, used for rationalizing, explaining, and predicting physical phenomena. Theoretical or computation astronomy uses these methods in the study of astronomical objects or phenomena.

PLANT SCIENCES (Code: PS)

Study of plant life. Ecology, agronomy, horticulture, forestry, plant taxonomy, physiology, pathology, plant genetics, hydroponics, algae, etc.

Subcategories:

Agriculture/Agronomy
Development
Ecology
Genetics
Photosynthesis
Plant Physiology (Molecular, Cellular, Organismal)
Plant Systematics, Evolution

AGR Agriculture/Agronomy - The application of soil and plant sciences to land management and crop production. Includes soil management, tillage, crop rotation, breeding, weed control, and climate related to crop production.

DEV Development - The study of plant life from egg to germination.

ECO Ecology (plant/animal or plant/plant interactions) - The science of the interactions and relationships between plants and plants and animals within their environment.

PHO Photosynthesis - The study of the process by which plants convert water and carbon dioxide into carbohydrates, using sunlight as the source of energy with the aid of chlorophyll.

PHY Plant Physiology (Molecular, Cellular, Organismal) - The study of the mechanical, physical, and biochemical functions of living organisms/plants.

POP Population Genetics - The study of genetic composition of populations in order to understand the evolutionary forces that select for particular genes.

SYST Plant Systematics and Evolution - Systematic classification of organisms and the evolutionary relationships among them; taxonomy.