Coorstek DMRSEF Categories

ANIMAL SCIENCES: This category includes all aspects of animals and animal life, animal life cycles, and animal interactions with one another or with their environment. Examples of investigations included in this category would involve the study of the structure, physiology, development, and classification of animals, animal ecology, animal husbandry, entomology, ichthyology, ornithology, and herpetology, as well as the study of animals at the cellular and molecular level which would include cytology, histology, and cellular physiology.

Subcategories:

Animal Behavior	Genetics	Cellular Studies	Nutrition & Growth
Development	Physiology	Ecology	Systematics & Evolution

BEHAVIORAL SCIENCES: 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:

Cognitive Psychology	Clinical & Developmental Psychology
Neuroscience	Physiological Psychology

BIOLOGICAL SCIENCES:

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

Subcategories:

Analytical Biochemistry	General Biochemistry
Medicinal Biochemistry	Structural Biochemistry

CELLULAR AND MOLECULAR BIOLOGY: This is an interdisciplinary field that studies the structure, function, intracellular pathways, and formation of cells. Studies involve understanding life and cellular processes specifically at the molecular level.

Subcategories:

Cell Physiology	Cellular Immunology	Genetics
Molecular Biology	Neurobiology	

MEDICINE & HEALTH SCIENCES:

BIOMEDICAL AND HEALTH SCIENCES-This category focuses on studies specifically designed to address issues of human health and disease. It includes studies on the diagnosis, treatment, prevention or epidemiology of disease and other damage to the human body or mental systems. Includes studies of normal functioning and may investigate internal as well as external factors such as feedback mechanisms, stress or environmental impact on human health and disease.

Subcategories:

Pathophysiology	Cell, Organ, and Systems Physiology	Nutrition and Natural Products
Immunology	Genetics and Molecular Biology of Disease	

TRANSLATIONAL MEDICAL SCIENCE-Projects that aim to improve human health and longevity by translating novel discoveries in the biomedical sciences into effective activities and tools for clinical and public health use. Bi-directional in concept, projects can be those developed through basic research moving toward clinical testing (bench-to-bedside) or projects that provide feedback about the applications of new treatments and how they can be improved (beside-to-bench).

Subcategories:

Disease Detection and Diagnosis	Disease Prevention	Pre-Clinical Studies
Disease Treatment and Therapies	Drug Identification and Testing	

CHEMISTRY: Studies exploring the science of the composition, structure, properties, and reactions of matter not involving biochemical systems.

Subcategories:

Analytical Chemistry	Computational Chemistry	Organic Chemistry	Physical Chemistry
Inorganic Chemistry	Materials Chemistry	Physical Chemistry	Environmental Chemistry

COMPUTER SCIENCES AND MATHMATICS:

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS: Studies that primarily focus on the discipline and techniques of computer science and mathematics as they relate to biological systems. This includes the development and application of data-analytical and theoretical methods, mathematical modeling and computational simulation techniques to the study of biological, behavior, and social systems.

Subcategories:

Computational Biomodeling	Computational Epidemiology	Computational Evolutionary Biology
Computational Neuroscience	Computational Pharmacology	Genomics

EMBEDDED SYSTEMS: Studies involving electrical systems in which information is conveyed via signals and waveforms for purposes of enhancing communications, control and/or sensing.

Subcategories:

Circuits	Internet of Things	Networking and Data Communications	
Optics	Microcontrollers	Sensors	Signal Processing

MATHEMATICS: 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.

Subcategories:

Algebra	Geometry and Topology	Combinatorics, Graph Theory, and Game Theory
Analysis	Probability and Statistics	Number Theory

SYSTEMS SOFTWARE: The study or development of software, information processes or methodologies to demonstrate, analyze, or control a process/solution.

Subcategories:

Algorithms	Cybersecurity	Human/Machine Interface	Databases
Mobile Apps	Online Learning	Languages and Operating Systems	

ROBOTICS AND INTELLIGENT MACHINES: Studies in which the use of machine intelligence is paramount to reducing the reliance on human intervention.

Subcategories:

Biomechanics	Cognitive Systems	Control Theory
Machine Learning	Robot Kinematic	

EARTH AND ENVIRONMENTAL SCIENCES: Studies of the environment and its effect on organisms/systems, including investigations of biological processes such as growth and life span, as well as studies of Earth systems and their evolution.

Subcategories:

Atmospheric Science	Climate Science	Geosciences
Water Science	Environmental Effects on Ecosystem	

ENERGY:

CHEMICAL: Studies involving biological and chemical processes of renewable energy sources, clean transport, and alternative fuels.

Subcategories:

Alternative Fuels	Solar Materials	Computational Energy Science
Fossil Fuel Energy	Microbial Fuel Cells	Fuel Cells and Battery Development

PHYSICAL: Studies of renewable energy structures/processes including energy production and efficiency.

Subcategories:

Hydro Power	Nuclear Power	Solar
Sustainable Design	Thermal Power	Wind

ENGINEERING:

BIOMEDICAL ENGINEERING: Projects that involve the application of engineering principles and design concepts to medicine and biology for healthcare purposes including diagnosis, monitoring and therapy. Prominent biomedical engineering applications include the development of biocompatible prostheses, various diagnostic and therapeutic medical devices ranging from clinical equipment to micro-implants, common imaging equipment such as MRIs and EEGs, regenerative tissue growth, pharmaceutical drugs and therapeutic biologicals.

Subcategories:

Biomaterials	Biomedical Devices	Regenerative Medicine	
Biomechanics	Biomedical Imaging	Cell and Tissue Engineering	Synthetic Biology

ENGINEERING MECHANICS: Studies that focus on the science and engineering that involve movement or structure. The movement can be by the apparatus or the movement can affect the apparatus.

Subcategories:

Naval Systems	Computational Mechanics	Aerospace and Aeronautical Engineering
Control Theory	Ground Vehicle Systems	Industrial Engineering-Processing
Civil Engineering	Mechanical Engineering	

ENVIRONMENTAL ENGINEERING: Studies that engineer or develop processes and infrastructure to solve environmental problems in the supply of water, the disposal of waste, or the control of pollution.

Subcategories:

Bioremediation	Recycling and Waste Management	Land Reclamation
Pollution Control	Water Resources Management	

MATERIALS SCIENCE: The study of the characteristics and uses of various materials with improvements to their design which may add to their advanced engineering performance.

Subcategories:

Biomaterials	Ceramic and Glasses	Electronic, Optical, and Magnetic Materials	
Nanomaterials	Computation and Theory	Composite Materials	Polymers

MICROBIOLOGY: The study of micro-organisms, including bacteria, viruses, fungi, prokaryotes, and simple eukaryotes as well as antimicrobial and antibiotic substances.

Subcategories:

Antimicrobial and Antibiotics	Applied Microbiology	Bacteriology
Environmental Microbiology	Microbial Genetics	Virology

PHYSICS AND ASTRONOMY: 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:

Biological Physics	Atomic, Molecular, and Optical Physics	Astronomy and Cosmology
Theoretical Physics	Computational Physics and Astrophysics	Nuclear and Particle Physics
Instrumentation	Condensed Matter and Materials	Mechanics
Quantum Computation	Magnetics, Electromagnetics and Plasmas	Optics, Lasers, and Masers

PLANT SCIENCES: Studies of plants and how they live, including structure, physiology, development, and classification. Includes plant cultivation, development, ecology, genetics and plant breeding, pathology, physiology, systematics and evolution.

Subcategories:

Agriculture and Agronomy	Ecology	Genetics and Breeding
Growth and Development	Pathology	Plant Physiology

SOCIAL SCIENCES: Sociology and Social Psychology (SOC): 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.