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**Animal Sciences** (AS)

2020 DMRSEF Categories

**Behavioral Science** (BS)

**Biological Sciences** -*Biochemistry* & *Cellular and Molecular Biology* (BIO)

**Engineering**- *Biomedical, Environmental Engineering & Engineering Mechanics (ENG)*

**Chemistry** (CH)

**Computer Sciences** -*Computational Biology, Bioinformatics, Embedded Systems, Mathematics,*

*Robotics, Intelligent Machines & Systems Software (CMP)*

**Earth and Environmental Sciences** (EEV)

**Energy**- *Chemical, Physical* (EGY)

**Materials Science** (MS)

**Medicine & Health Science** -*Biomedical, Health & Translational Medical Science (MED)*

**Microbiology** (MI)

**Physics and Astronomy** (PA)

**Plant Sciences** (PS)

**Social Sciences** (SS)

**ANIMAL SCIENCES (Code: AS)**

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 (Code: BS)**

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

Neuroscience  
Physiological Psychology

**BIOLOGICAL SCIENCES (BIO)**

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.

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.

**BIOCHEMISTRY** Subcategories**:**

Analytical Biochemistry

General Biochemistry  
Medicinal Biochemistry

Structural Biochemistry

**CELLULAR & MOLECULAR BIOLOGY** Subcategories**:**

Cell Physiology

Cellular Immunology

Genetics

Molecular Biology

Neurobiology

**MEDICINE & HEALTH SCIENCES (MED)**

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.

**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).

**BIOMEDICAL AND HEALTH SCIENCES**

Subcategories:

Cell, Organ, and Systems Physiology

Genetics and Molecular Biology of Disease

Immunology

Nutrition and Natural Products

Pathophysiology

**TRANSLATIONAL MEDICAL SCIENCE**

Subcategories:

Disease Detection and Diagnosis

Disease Prevention

Disease Treatment and Therapies

Drug Identification and Testing

Pre-Clinical Studies

**CHEMISTRY (Code: CH)**

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

Subcategories:

Analytical Chemistry

Computational Chemistry

Environmental Chemistry  
Inorganic Chemistry

Materials Chemistry  
Organic Chemistry  
Physical Chemistry

**COMPUTER SCIENCES (CMP)**

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.

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

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.

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

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

**COMPUTATIONAL BIOLOGY & BIOINFORMATICS** Subcategories**:**

Computational Biomodeling

Computational Epidemiology

Computational Evolutionary Biology

Computational Neuroscience

Computational Pharmacology

Genomics

**EMBEDDED SYSTEMS** Subcategories:

Circuits

Internet of Things

Microcontrollers

Networking and Data Communications

Optics

Sensors

Signal Processing

**MATHEMATICS** Subcategories:

Algebra  
Analysis

Combinatorics, Graph Theory, and Game Theory  
Geometry and Topology

Number Theory  
Probability and Statistics

**ROBOTICS AND INTELLIGENT MACHINES** Subcategories:

Biomechanics

Cognitive Systems

Control Theory

Machine Learning

Robot Kinematics

**SYSTEMS SOFTWARE** Subcategories:

Algorithms

Cybersecurity

Databases

Human/Machine Interface

Languages and Operating Systems

Mobile Apps

Online Learning

**EARTH AND ENVIRONMENTAL SCIENCES (Code: EEV)**

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

Environmental Effects on Ecosystems

Geosciences

Water Science

**ENERGY (EGY)**

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

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

**ENERGY: CHEMICAL** Subcategories:

Alternative Fuels

Computational Energy Science

Fossil Fuel Energy

Fuel Cells and Battery Development

Microbial Fuel Cells

Solar Materials

**ENERGY: PHYSICAL** Subcategories:

Hydro Power

Nuclear Power

Solar

Sustainable Design

Thermal Power

Wind

**ENGINEERING (ENG)**

**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.

**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.

**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.

**BIOMEDICAL ENGINEERING** Subcategories:

Biomaterials and Regenerative Medicine

Biomechanics

Biomedical Devices

Biomedical Imaging

Cell and Tissue Engineering

Synthetic Biology

**ENGINEERING MECHANICS** Subcategories:

Aerospace and Aeronautical Engineering

Civil Engineering

Computational Mechanics

Control Theory

Ground Vehicle Systems

Industrial Engineering-Processing  
Mechanical Engineering

Naval Systems

**ENVIRONMENTAL ENGINEERING** Subcategories:

Bioremediation

Land Reclamation

Pollution Control

Recycling and Waste Management

Water Resources Management

**MATERIALS SCIENCE (Code: MS)-**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

Composite Materials

Computation and Theory

Electronic, Optical, and Magnetic Materials

Nanomaterials

Polymers

**MICROBIOLOGY (Code: MI)**

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 (Code: PA)**

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:

Atomic, Molecular, and Optical Physics

Astronomy and Cosmology  
Biological Physics

Computational Physics and Astrophysics

Condensed Matter and Materials  
Instrumentation

Magnetics, Electromagnetics and Plasmas

Mechanics  
Nuclear and Particle Physics  
Optics, Lasers, and Masers

Quantum Computation   
Theoretical Physics

**PLANT SCIENCES (Code: PS)**

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 (SS)**

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.