



Recently, the International Science and Engineering Fair (ISEF) has expanded its project categories. These changes may be found on the [ISEF website](#). Due to this, the Alabama Science and Engineering Fair (ASEF) and the North Alabama Regional Science & Engineering Fair (NARSEF) have modified their category structure to better align with the new ISEF categories.

Individual school fairs may still choose to set up categories that work for their programs. However, once fair winners are advanced in STEM Wizard to NARSEF (and subsequently ASEF), students will be required to select from one of the NARSEF/ASEF categories listed below. Teachers and students should review the project category descriptions to ensure that their project fits the description.

NOTE: NARSEF and ASEF Fair Directors reserve the right to reassign projects to different categories to ensure that the project is reviewed and scored by the most appropriate judges possible.

Category Code	NARSEF/ASEF Category	ISEF Category
100	Animal & Plant Sciences	Animal Sciences (ANIM) Plant Sciences (PLNT)
200	Behavioral & Social Sciences	Behavioral and Social Sciences (BEHA)
300	Cell, Molecular, Microbiology & Biochemistry	Microbiology (MCRO) Cellular and Molecular Biology (CELL) Biochemistry (BCHM)
400	Chemistry	Chemistry (CHEM) Materials Science (MATS)
500	Engineering	Engineering Technology: Statics and Dynamics (ETSD)
600	Energy	Energy: Sustainable Materials and Design (EGSD)
700	Earth and Environmental Sciences & Environmental Engineering	Earth and Environmental Sciences (EAEV) Environmental Engineering (ENEV)
800	Biomedical Engineering & Biomedical and Health Sciences	Biomedical and Health Sciences (BMED) Translational Medical Science (TMED) Biomedical Engineering (ENBM)
900	Physics, Astronomy, & Mathematics	Physics and Astronomy (PHYS) Mathematics (MATH)
1100	Robotic Systems & Communication Technology	Robotics and Intelligent Machines (ROBO) Systems Software (SOFT) Embedded Systems (EBED)
1200	Computational and Bioinformatics Sciences	Computational Biology and Bioinformatics (CBIO)

Below are descriptions for each project category:

100 – Animal & Plant Sciences

ANIMAL SCIENCES (Code: ANIM) - 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. Project subcategories could include:

Animal Behavior

Cellular Studies

Development

Ecology
Genetics
Nutrition and Growth
Physiology
Systematics and Evolution

PLANT SCIENCES (Code: PLNT) - 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. Project subcategories could include:

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

200 – Behavioral & Social Sciences

BEHAVIORAL AND SOCIAL SCIENCES (Code: BEHA) - 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. Project subcategories could include:

Clinical & Developmental Psychology
Cognitive Psychology
Neuroscience
Physiological Psychology
Sociology and Social Psychology

300 – Cell, Molecular, Microbiology & Biochemistry

CELLULAR AND MOLECULAR BIOLOGY (Code: CELL) - 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. Project subcategories could include:

Cell Physiology
Cellular Immunology
Genetics
Molecular Biology
Neurobiology

MICROBIOLOGY (Code: MCRO) - The study of micro-organisms, including bacteria, viruses, fungi, prokaryotes, and simple eukaryotes as well as antimicrobial and antibiotic substances. Project subcategories could include:

Cell Physiology
Cellular Immunology
Genetics
Molecular Biology
Neurobiology

BIOCHEMISTRY (Code: BCHM) - 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. Project subcategories could include:

Analytical Biochemistry

General Biochemistry

Medicinal Biochemistry

Structural Biochemistry

400 – Chemistry

CHEMISTRY (Code: CHEM) - Studies exploring the science of the composition, structure, properties, and reactions of matter not involving biochemical systems. Project subcategories could include:

Analytical Chemistry

Computational Chemistry

Environmental Chemistry

Inorganic Chemistry

Materials Chemistry

Organic Chemistry

Physical Chemistry

MATERIALS SCIENCE (Code: MATS) - The study of the integration of various materials forms in systems, devices, and components that rely on their unique and specific properties. It involves their synthesis and processing in the form of nanoparticles, nanofibers, and nanolayered structures, to coatings and laminates, to bulk monolithic, single/poly-crystalline, glassy, soft/hard solid, composite, and cellular structures. It also involves measurements of various properties and characterization of the structure across length scales, in addition to multi-scale modeling and computations for process-structure and structure-property correlations. Project subcategories could include:

Biomaterials

Ceramic and Glasses

Composite Materials

Computation and Theory

Electronic, Optical, and Magnetic Materials

Nanomaterials

Polymers

500 – Engineering

ENGINEERING MECHANICS (Code: ENMC) - 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. Project subcategories could include:

Aerospace and Aeronautical Engineering

Civil Engineering

Computational Mechanics

Control Theory

Ground Vehicle Systems

Industrial Engineering-Processing

Mechanical Engineering

Naval Systems

600 – Energy

ENERGY: SUSTAINABLE MATERIALS & DESIGN (EGSD) - Studies/processes involving the production and/or storage of energy. Project subcategories could include:

Biological Process and Design
Solar Process, Materials, and Design
Energy Storage
Wind and Water Movement Power Generation
Hydrogen Generation and Storage
Thermal Generation and Design
Triboelectricity and Electrolysis

700 – Earth and Environmental Sciences & Environmental Engineering

EARTH AND ENVIRONMENTAL SCIENCES (Code: EAEV) - 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. Project subcategories could include:

Atmospheric Science
Climate Science
Environmental Effects on Ecosystems
Geosciences
Water Science

ENVIRONMENTAL ENGINEERING (Code: ENEV) - 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. Project subcategories could include:

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

800 – Biomedical Engineering & Biomedical and Health Sciences

BIOMEDICAL AND HEALTH SCIENCES (Code: BMED) - 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. Project subcategories could include:

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

Translational Medical Science (Code: TMED) - 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). Project subcategories could include:

Disease Detection and Diagnosis

Disease Prevention

Disease Treatment and Therapies

Drug Identification and Testing

Pre-Clinical Studies

900 – Physics, Astronomy, & Mathematics

PHYSICS AND ASTRONOMY (Code: PHYS) - 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. Project subcategories could include:

Atomic, Molecular, and Optical Physics

Astronomy and Cosmology

Biological Physics

Condensed Matter and Materials

Mechanics

Nuclear and Particle Physics

Theoretical, Computational, and Quantum Physics

MATHEMATICS (Code: MATH) - 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. Project subcategories could include:

Algebra

Analysis

Combinatorics, Graph Theory, and Game Theory

Geometry and Topology

Number Theory

Probability and Statistics

1100 – Robotic Systems and Communication Technology

ROBOTICS AND INTELLIGENT MACHINES (Code: ROBO) - Studies in which the use of machine intelligence is paramount to reducing the reliance on human intervention. Project subcategories could include:

Biomechanics

Cognitive Systems

Control Theory

Machine Learning

Robot Kinematics

SYSTEMS SOFTWARE (Code: SOFT) - The study or development of software, information processes or methodologies to demonstrate, analyze, or control a process/solution. Project subcategories could include:

Algorithms

Cybersecurity

Databases

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

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

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

1200 – Computational and Bioinformatics Sciences

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS (Code: CBIO) - 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, behavioral, and social systems. Project subcategories could include:

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