Field of Study	Subfield	The information below provides a very brief field of study description. While it is our intent to provide general information, please understand that the listing of fields is not exhaustive nor are the definitions encyclopedic. Descriptions are the result of using IIE's internal information as well as researching internet sources.
Aeronautics and Astronomics / Aeronautical Engineering		The science, theory and practice of flight, which includes designing, making, and flying an aircraft.
Agriculture		It is a very broad discipline; frequently study is very applied. However, for this award, programs need to be researched based and theoretical.
	Entomology	Study of insects. Some of the focus areas are biological control and beekeeping.
	Plant Biology	Plant Biology might be grouped into these areas of specialization: cell and developmental biology; environmental and integrative biology; molecular biology, biochemistry, and genomics; and systematics and evolutionary biology. These areas permit students to conduct research on topics such as anatomy, biochemistry, cell biology, cytology, developmental biology, evolutionary biology, genetics, genomics, molecular biology, morphology, paleobotany, pathology, physiology, population biology, systematics, and weed science.
	Plant Pathology	Plant pathology (also **phytopathology**) is the scientific study of plant diseases caused by pathogens (infectious diseases) and environmental conditions (physiological factors). Organisms that cause infectious disease include fungi, oomycetes, bacteria, viruses, viroids, virus-like organisms, phytoplasmas, protozoa, nematodes and parasitic plants. You may specialize in the physiology, biochemistry, and molecular biology of plant pathogens or host-pathogen interactions; the biology and ecology of plant pathogens; epidemiology and modeling of plant diseases; and the diagnosis and control of plant diseases, including chemical, biological and integrated methods of control.
	Soil Science	Soil science is the study of soil as a natural resource on the surface of the earth. It involves the study of various aspects of the living soil ecosystems. The focus areas are: Soil physics; Soil chemistry and mineralogy; Soil biochemistry; Soil fertility.
Astronomy		The branch of physics that studies celestial bodies and the universe as a whole. It is the science involving the observation and theories about the solar system, the stars, the galaxies, and the general structure of space. Astronomy also includes cosmology, which is the study of the structure, origin, and

		evolution of the universe.
Biology		Biology is the science of life. Biological sciences are generally divided into the study of animals and plants. Biology is concerned with the characteristics and behaviors of organisms, how species and individuals come into existence, and the interactions they have with each other and with their environment.
	Anatomy	The study of the structure and organization of living things. It can be divided into animal anatomy (zootomy) and plant anatomy (phytotomy).
	Biochemistry	The study of the chemistry of life, a bridge between biology and chemistry that studies how complex chemical reactions and chemical structures give rise to life. It is a hybrid branch of chemistry which specializes in the chemical processes and chemical transformations in living organisms.
	Biotechnology	A form of applied biology that utilizes living organisms to make or modify products, run processes or improve plants and animals. Biotechnology focuses on the study of microbes, genetic engineering, and the sequencing of DNA.
	Botany	The scientific study of plant life. Botany is also sometimes referred to as plant science or plant biology.
	Cell Biology	The study of cells, which includes their physiological properties, their structure, the organelles they contain,interactions with their environment, their life cycle, division and death. This is done both on a microscopic and molecular level. Cell biology research covers single-celled organisms like bacteria and the many specialized cells in multi-cellular organisms like humans
	Ecology	The study of the distribution and abundance of living organisms and how the distribution and abundance are affected by interactions between the organisms and their environment. The environment of an organism includes both physical properties, which can be described as the sum of local abiotic factors such as solar insulation, climate and geology, as well as the other organisms that share its habitat.
	Evolutionary Biology	The study of the origin and descent of species, as well as their change, multiplication, and diversity over time.
	Genetics	The science of genes, heredity, and variation of organisms.
	Immunology	The study of the immune system in all organisms. Immunology deals with the physiological functioning of the immune system in states of both health and disease; malfunctions of the immune system in immunological disorders (autoimmune diseases, hypersensitivities, immune deficiency, allograft rejection); and the physical, chemical and physiological characteristics of the components of the immune system.

	Marine Biology	The study of the plants, animals and other organisms that live in the ocean.
	Microbiology	The study of microorganisms, which are unicellular or cell-cluster microscopic organisms. This includes eukaryotes (with a nucleus) such as fungi and protists, and prokaryotes (without a nucleus) such as bacteria and viruses.
	Molecular Biology	The study of biology at a molecular level, namely, the interactions between the various systems of a cell, including the interrelationship of DNA, RNA and protein synthesis and learning how these interactions are regulated.
	Parasitology	The study of parasites, their hosts, and the relationship between them.
	Photobiology	The scientific study of the effects of light on living organisms.
	Physiology	The study of the mechanical, physical, and biochemical functions of living organisms.
	Virology	The study of biological viruses; including, their structure and classification, their ways to infect and exploit cells to reproduce and cause disease, the techniques to isolate and culture them, and their potential uses in research and therapy.
	Zoology	The study of animals.
Biomedical Engineering		The discipline concerned with the development and manufacturing of prostheses, medical devices, diagnostic devices, drugs and other therapies. It is a field that combines the expertise of engineering with medical needs for the progress of health care. This field is more concerned with biological, safety and regulatory issues than other forms of engineering.
Chemistry		The branch of the natural sciences dealing with the composition of substances, their properties, reactions and effects upon one another.
	Environmental Chemistry	The study of the sources, reactions, transport, effect

	Organic Chemistry	The study of the structures, synthesis, and reactions of carbon-containing compounds.
	Physical Chemistry	The branch of chemistry dealing with the physical properties of chemical substances.
	Synthetic Chemistry	A branch of chemistry that focuses on the deliberate manufacture of pure compounds of defined structure and/or the development of new chemical reactions for this purpose.
	Theoretical Chemistry	Theoretical chemistry is the use of non-experimental reasoning to explain or predict chemical phenomena. In recent years, it has consisted primarily of quantum chemistry, i.e., the application of quantum mechanics to problems in chemistry.
Computer Science		The systematic study of computing systems and computation. The body of knowledge resulting from this discipline contains theories for understanding computing systems and methods; design methodology, algorithms, and tools; methods for the testing of concepts; methods of analysis and verification; and knowledge representation and implementation.
	Artificial Intelligence	AI is a complex, highly interdisciplinary branch of computer science that attempts to incorporate the principles of human intelligence and reasoning into computing systems. AI research is concerned with modeling all facets of human intelligence, but most often the research involves creating computer systems that have the ability to plan (automated deduction), adapt to different situations (machine learning), acquire human-like senses (machine vision and natural-language processing), and effect changes to the environment (robotics).
	Cognitive Science	A branch of computer science that is concerned with understanding, simulating, and enhancing both natural and artificial intelligence. Highly interdisciplinary in nature, cognitive science draws from research in artificial intelligence, psychology, anthropology, linguistics, philosophy, neuroscience, and engineering.
	Computer Engineering	A broad discipline that incorporates the fields of computer science and electrical engineering. Computer engineering emphasizes the theory, design, and development of computers and computer-related technology including both hardware and software.
	Computer Graphics	This specialization, which is related to graphic design and the visual arts, combines video and computer technologies to produce two-, three-, and four-dimensional graphic images (such as those seen in video games and computer- animated films) using computers.
	Computer Networks	The study of the principles of communication between computers. Computer networking emphasizes the design of local area networks (LANs), which connect computers within a small geographical area, and wide area networks (WANs), which use telephone lines or radio waves to connect computers thousands of miles apart.

	Computer Programming	One of the most open-ended and commonly pursued specializations, computer programming involves the study of how to instruct computers to perform certain tasks and how to write detailed instructions that list the steps a computer must follow in order to solve a problem. Such study also involves testing computer programs for problems ("debugging" them).
	Data Processing	A broad, often confusing term used to describe a wide range of fields involving the study of how data is stored in computers (for example, stacks, queues, and files) and how data can be processed to solve accounting and management problems. In most cases, data processing courses and programs are offered through business rather than computer science departments.
	Database Systems	The study of systems, known as databases, that can efficiently store, process, and retrieve substantial quantities of information.
	Neural Networks	The study of computer systems modeled after the biological nervous system. Neural networks are designed to imitate the workings of the human brain and are used in areas such as voice and pattern recognition and speech synthesis.
	Robotics	A branch of computer science that applies artificial intelligence and engineering concepts to create and program mechanical devices (robots) that are able to perform a variety of tasks including some previously performed by humans. Sometimes offered as a specialization in Electrical Engineering.
	Software Engineering	A still-evolving discipline based on computer science, computer technology, management, and engineering economics. It is concerned with the cost- effective development and modification of computer software components, software engineering may use computer-aided software engineering (CASE) to reduce the time required by programmers to generate new programs and revise old ones.
	Systems Analysis	A branch of computer science that involves the analysis of existing computer systems and the design of new systems that meet the specific information needs of an organization.
	Telecommunications Engineering	A specialization that joins computer technology with information processing and distribution. Telecommunications engineering involves the analysis and design of all systems that receive, transmit, and deliver information.
Energy		A highly interdisciplinary field that combines engineering, chemistry, physics, environmental science and public policy in order to develop and improve the operation and design of energy systems.
Engineering		The practical application of science to commerce or industry; the discipline dealing with the art or science of applying scientific knowledge to practical problems.
	Aerospace Engineering	The branch of engineering concerning aircraft, spacecraft and related topics. It is often called aeronautical engineering, particularly when referring solely to aircraft, and astronautical engineering,

		when referring to spacecraft.
	Chemical Engineering	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. The chemical engineer must be familiar with both chemistry and mechanical engineering.
	Civil Engineering	The field of engineering that includes the planning, designing, construction, and maintenance of structures and altering geography to suit human needs. Some of the numerous subdivisions are transportation (e.g., railroad facilities and highways); hydraulics (e.g., river control, irrigation, swamp draining, water supply, and sewage disposal, wastewater management); structures (e.g., buildings, bridges, and tunnels) and construction management.
	Electrical Engineering	The practical applications of the theory of electricity; the branch of engineering science that studies the uses of electricity and the equipment for power generation and distribution and the control of machines and communication. Some of the subfields are power, control systems, electronics and telecommunications, digital signal processing and networking.
	Environmental Engineering	Environmental Engineering is a relatively new branch of the profession of engineering that has developed from traditional branches of engineering in response to demands from our modern society. Environmental Engineering offers careers that cover a broad range of activities including the planning, design and maintenance of both public and private developments. In particular, environmental engineers are responsible for control and treatment of waste products, water supply and wastewater treatment systems, assessment of impacts on the environment and management of large ecosystems.
	Mechanical Engineering	Mechanical engineering is the application of physical principles to the creation of useful devices, objects and machines. Mechanical engineers use principles such as heat, force, and the conservation of mass and energy to analyze static and dynamic physical systems, in contributing to the design of things such as automobiles, aircraft, and other vehicles, heating and cooling systems, household appliances, industrial equipment and machinery, weapons systems, etc.
	Ocean Engineering	Ocean engineering is a multidisciplinary field of technology applied to the ocean environment. It is a combination of the classical engineering disciplines such as civil, mechanical and electrical engineering with naval architecture and applied ocean sciences. Students who wish to specialize in specific Ocean Engineering programs may pursue in-depth studies in the areas of acoustics, vibrations and signal processing, materials and corrosion, marine structures and geotechnic, marine hydrodynamics or automated undersea vehicles.
	Petroleum Engineering	Engineering that involves the extraction, purification, production and utilization of petroleum and natural gas; Petroleum Engineering is involved in the exploration and production activities of petroleum at the upstream end of the energy sector. The diverse topics covered by petroleum engineering are closely related to the earth sciences. Petroleum engineering topics include geology, geochemistry, geophysics,

		oil drilling, well logging, well completion, oil and gas production, reservoir development, and pipelining.
Earth and Atmospheric Sciences, Meteorology		The comprehensive study of the physics, chemistry, and dynamics of the earth's atmosphere, from the earth's surface to several hundred kilometers; this usually includes atmospheric chemistry, aeronomy, magnetospheric physics, and solar influences on the entire region. Meteorology is the scientific study of the atmosphere that focuses on weather processes and forecasting. Meteorological phenomena are observable weather events which illuminate and are explained by the science of meteorology. Those events are bound by the variables that exist in Earth's atmosphere. They are temperature, pressure, water vapor, and the gradients and interactions of each variable, and how they change in time.
Environmental Science		The systematic, scientific study of our environment as well as our role in it. Environmental science is the science of the interactions between the physical, chemical, and biological components of the environment, including their effects on all types of organisms but more often refers to human impact on the environment.
Geology		Geology is the science and study of the Earth, its composition, structure, physical properties, history, and the processes that shape it. It is one of the Earth sciences. It is the science devoted to the study of the structure and evolution of the earth's crust; the forces acting to deform the outer layers of the Earth and create ocean basins and continents; the processes that modify the Earth's surface.
Information Sciences/ Engineering		Information Science or Informatics is the science of information. It is often, though not exclusively, studied as a branch of computer science and information technology and is related to database, ontology and software engineering. See more under Computer Science.
Material Science/ Engineering		Materials science is a multidisciplinary field focusing on functional solids, whether the function served is structural, electronic, thermal, chemical, magnetic, optical, or some combination of these. It uses those parts of chemistry and physics that deal with the properties of materials, but also includes a distinctive set of scientific techniques that probe materials structure.
Mathematics		A science (or group of related sciences) dealing with the logic of quantity and shape and arrangement.
	Actuarial Science	Actuarial science applies mathematical and statistical methods to finance and insurance, particularly to the assessment of risk
	Algebra	Algebra is a branch of mathematics which may be roughly characterized as a generalization and extension of arithmetic, in which symbols are employed to denote operations, and letters to represent number and quantity.
	Algebraic Geometry	A branch of mathematics which can be seen as the study of solution sets of systems of polynomials.
	Applied Mathematics	A branch of mathematics that concerns itself with the mathematical techniques typically used in the

		application of mathematical knowledge to other domains such as the physical, biological or sociological world.
	Combinatorics	Combinatorics is a branch of mathematics that studies finite collections of objects that satisfy specified criteria. In particular, it is concerned with "counting" the objects in those collections (enumerative combinatorics) and with deciding whether certain "optimal" objects exist (extremal combinatorics) and which "algebraic" structures these objects have (algebraic combinatorics).
	Differential Equations	The study of equations in which the derivatives of a function appear as variables.
	Financial Mathematics	Mathematical finance is the branch of applied mathematics concerned with the financial markets.
	Geometry and Topology	A branch of mathematics that refers to spatial relationships such as adjacency and connectivity. This branch of geometric mathematics is concerned with order, contiguity, and relative position, rather than actual linear dimensions.
	Logic	A subfield of mathematics that is concerned with formal systems in relation to the way that they encode intuitive concepts of mathematical objects such as sets and numbers, proofs, and computation.
	Mathematical Physics	This scientific discipline is concerned with the interface of math and physics. This is a very broad area that includes research aimed at studying and solving problems inspired by physics within a mathematically framework and results from physics being used to help prove facts in abstract mathematics. Common specialties include: dynamical systems, hamiltonian mechanics, and quantum field theory.
	Number Theory	The branch of pure mathematics concerned with the properties of numbers in general, and integers in particular.
	Statistics	A mathematical science pertaining to collection, analysis, interpretation, and presentation of quantitative data as well as drawing valid conclusions and making reasonable decisions on the basis of such analysis.
Neurosciences		The field of study that deals with the structure, function, development, genetics, biochemistry, physiology, pharmacology, and pathology of the nervous system, consisting of the nerve pathways that run throughout the body. The study of behavior and learning is also a division of neuroscience.
Oceanography		Oceanography or marine science is the study of the Earth's oceans and seas. Oceanographers study a wide range of topics such as plate tectonics to ocean currents to marine organisms. These diverse topics reflect multiple disciplines that oceanographers blend to help us understand Earth's interdependencies: biology, chemistry, geology, meteorology and physics.

	Chemical oceanography	The study of the chemistry of the ocean.
	Marine biology/biological oceanography	The study of the plants and animals (biota) of the oceans and their ecological interaction.
	Marine geology/geological oceanography	The study of the geology of the ocean floor including plate tectonics.
	Meteorological oceanography	The study of the interactions between our atmosphere and the ocean's hydrosphere.
	Physical oceanography	The study of the ocean's physical attributes (such as its temperature-salinity structure, waves, tides and currents).
Physics		The science of matter and energy and their interactions. It is the branch of science that describes matter, energy, space and time at its most fundamental level. The goal of physics is to find the most basic laws that govern the universe. All subfields of Physics can be divided into theoretical or experimental.
	Astrophysics	The alliance of physics and astronomy where physics is applied to the stars, stellar systems and interstellar material.
	Atomic, Molecular and Optical Physics	Atomic physics is the branch of physics that studies the internal structure of atomic nuclei. Molecular physics is the study of the physical properties of molecules and of the chemical bonds between atoms that bind them into molecules. Optical physics is the study of the behavior and properties of light and the interaction of light with matter. These three branches are often grouped together as one research area at universities.
	Biophysics	The application of physical principles and methods to the study of the structures of living organisms and the mechanics of life processes.
	Condensed Matter Physics	The field of physics that deals with the macroscopic physical properties of matter. This branch is concerned with condensed phases; the most familiar examples being solids and liquids.
	High Energy Physics	The branch of physics that studies subatomic particles and their interactions.
	Nuclear Physics	A branch of physics that includes the study of the nuclei of atoms, their interactions with each other,

		and with constituent particles.
	Quantum Physics	A branch of science that deals with discrete, indivisible units of energy called quanta as described by the Quantum Theory. This branch of physics deals with incredible small particles such as electrons, protons and neutrons.
Planetary Science		Planetary science, also known as planetology or planetary astronomy, is the science of planets and the solar system. Planetary science may be considered a part of the Earth sciences, or more logically, as its parent field. Research tends to be done by a combination of astronomy, space exploration (particularly unmanned space missions), and comparative, experimental and meteorite work based on Earth.
Public Health		The science of maintaining, protecting and improving the health of communities through disease and injury prevention research.
	Biostatistics	The use of statistical methodology for analyzing health related data.
	Epidemiology	The study of patterns of disease and injury in human populations and the application of this study to the control of health problems.