What can I do with a major in science and technology?

Education Level Key: C = Certificate, D = Diploma, A = Associate Degree, B = Bachelor's, M = Master's, P = PhD.

AEROSPACE/AVIATION

Aerospace Engineering (B) – design, develop, test, and help produce commercial and military aircrafts, missiles and spacecraft. The also work on designing and developing hydrofoil ships (deep diving vessels) and vehicles for high speed ground transportation.

Air Traffic Control (C, A) – responsible for the safe and efficient flow of air traffic. They direct pilots, using information received from various sources, the use of radar, radios, and computers. They give take-off clearance, taxiing instructions, operate runway systems, and provide information on weather and suggested routes.

Aviation – Professional Flight (varies) – a pilot is at the controls of a plane and responsible for a safe and efficient flight.

Aviation Management/Administration (C, A, B) – establish and enforce aviation policy, negotiate leases with airport users, and develop and manage aviation maintenance programs. They supervise, and train personnel, maintain needs, and prepare budgets.

Avionics (D) – develop, install, test, and repair communications, navigation, and radar systems in general aviation and air carrier aircraft. Technicians calibrate installed or repaired equipment to specifications and adjust radio frequencies.

AGRICULTURE

Agriculture Industries and Marketing (B) – includes manufacturing of farm equipment, structures, plant and animal protection products, and fertilizers; producers of seeds, animal feed; and the assemblers, processors, manufacturers, and distributors of farm products. There are opportunities in agribusiness, government, education, communication, and natural resource management.

Animal and Plant Systems (B) – with this background, one may work as managers and technical advisors in areas of farm animal and poultry production; crop, vegetable, and fruit production and improvement; environmental horticulture; or the identification and control of insects, weeds, and diseases that affect crops.

Biosystems and Agriculture Engineering (B, M, P) – employ mathematics and science, plus creativity and design to produce something new. They create solutions to meet the needs of people in relation to health, safety, environmental, political, and social concerns.

Food Science (B) – apply scientific principles of chemistry, physics, economics, microbiology, nutrition, management, and marketing to the manufacture, distribution, marketing, and consumer aspects of food. Career may include production management, research and development, marketing, management, technical sales and promotion, and quality control management.

Horticulture Technology (C, D, A) – this line of work includes identifying, growing, and using plants. This may involve specializing in greenhouse or nursery production, landscaping, indoor "plantscaping" or floral design. Horticulturists understand the use of soil, pesticides, fertilizers, irrigation systems, propagation methods, and other tools for growing plants.

Science in Agriculture (B) – with a background in biological/physical sciences, mathematics and applications to food and agriculture, they work with environmental, resource, and technological issues, usually in the area of research.

ARCHITECTURE

Architectural Drafting (D, A) – prepare accurate and detailed scale drawings to construct buildings from rough sketches, specifications, and calculations made by architects. They may also make engineering computations involving strength of materials.

Architectural Technology (C, D, A) – play a supporting role in architectural or construction firms. Their duties may include designing, drafting, estimating, building models, writing specifications, and preparing contract documents.

Architecture (B, M) – They use the knowledge of fine arts, construction materials and methods, engineering, and architectural techniques to design structures. Their work includes consulting with clients to determine needs, preparing information on design, specifications, materials, equipment, cost, building time, and planning layout. They may also prepare manuals, studies, and reports.

BIOMEDICAL

Biomedical Engineer (B, M) – use engineering principles to solve medical problems. They conduct research to test and modify known theories and develop new theories of life systems, and design life support apparatus utilizing principles of engineering and bio-behavioral sciences (artificial hearts, pacemakers, lasers for surgery, etc.)
Biomedical Equipment Technician (C, D A) – handles the installation, operation, repair, maintenance, and calibration of electronic equipment. The technician demonstrates the use of the equipment to other staff and health science students.

CHEMICAL ENGINEERING/TECHNOLOGY

Chemical Engineering (B, M, P) – involves the development of processes and equipment for the manufacture of chemical products or for industries that are based on some chemical or physical transformation of matter. Chemical engineers may work in the metallurgical industry, food processing, environmental protection and industrial waste disposal, energy production, biomedical engineering, and the manufacturing of fertilizers, paints, ceramics, semiconductors, polymer fibers, films, coatings, textiles, paper, explosives, rubber, solvents, plastics, agriculture chemicals, pharmaceuticals, batteries, and other products.

Chemical Laboratory Technology (D, A) – work with chemists and chemical engineers in labs or plants to develop, sell, or utilize products and equipment. The technician may direct the routine analysis of the supplies and products of a chemical plant, or carry out tests on new products or processes. They may also set up equipment, prepare solutions according to formulas, conduct tests, measure reactions, and record data.

CIVIL ENGINEERING/SURVEYING

Civil Engineering (B, M, P) – plan, design, and supervise the construction and maintenance of a wide variety of structures: buildings, tunnels, bridges, highways, transit systems, dams, airports, irrigation projects, canals, space satellites and launching facilities, offshore structures, treatment and distribution facilities for water, and collection and treatment facilities for waste. Civil engineers work on solving problems facing communities worldwide, including pollution, air and automobile traffic congestion, energy needs, flood and earthquake preparation, and urban decay.

Civil Engineering Technology (D, A) – work with civil engineers performing various tasks required for a construction project, including collecting and analyzing site data; surveying and mapping land areas, drawing construction plans; calculating loads and stresses; supervising and inspecting construction activities. May also estimate costs and outline material specifications.

Surveying (D, A) – establish official land boundaries, completing land valuations, measuring mineral and construction sites, and collecting information for maps and charts. Survey technicians adjust and operate electronic distance-measuring devices and surveying instruments used to measure horizontal and vertical angles. They also make notes and draw sketches and enter survey data into a computer.

COMPUTER SCIENCE & TECHNOLOGY

Computer Engineering (B, M, P) – involves the theory, architecture, design, and application of digital computers and their use as information processing, control, and communication systems. The computer engineer understands the principles of mathematics, engineering, and computer science; and is knowledgeable about circuits, networks, and electronics. The computer engineer may set up mathematical models of systems to solve problems, and convert the mathematical equations into computer equations.

Computer Operations (C, D, A) – oversee the operation of computer hardware systems. They work from instructions provided by the computer programmer. Operators set controls to run computer programs, including loading paper, disks, or tapes into the computer; watch for and respond to computer and error messages; solve error problems; and maintain records of the operation.

Computer Programming (C, D, A) – The programmer analyzes the problem, selects the best means of solving it, breaks it down into logical, step-by-step process, and encodes the instruction in computer language. They then test the programs, and prepare instruction and user manuals for computer operators who run the programs.

Computer Science/Information Systems (B, M) – concerned with the study of the hardware and software aspects of high speed computing devices and with applying these devices to solve a variety of technological and business problems. Individuals may work as a systems analyst or application programmers.

ELECTRICAL ENGINEERING AND TECHNOLOGY

Electrical/Electronics Engineering (B) – design, develop, test, and maintain electrical and electronic systems and equipment. They may specialize in the areas of control and communications engineering bioengineering, computer engineering, digital circuits and systems, energy conversion and power systems, microelectronic devices and circuits design, and physical electronics. In addition to working in design and testing, electrical engineers may work in marketing and sales, manufacturing, management, or education.

Electro-Mechanical Engineering Technology (D, A) – skilled in testing, calibration, maintenance, troubleshooting, repair, installation, assembly, and sales of electrical and mechanical systems. Systems include electronic, electrical, mechanical, hydraulic, pneumatic, digital, and servomechanism devices, and may exist in industrial settings, communications, or computer businesses.

Electronic Engineering Technology (A, B) – understand electronics theory and design, and applications to digital and analog circuits and systems. They have hands-on technical skills, and apply scientific and engineering knowledge and methods in support of engineering activities. Areas include: computers, medical electronics, automation and robotics, radar, and communications.

Electronics/Electrical Technology (D, A) - have an understanding of how electronic components, circuits, and systems work, and apply this knowledge to the installation, maintenance, diagnosis, and repair of specialized electronic equipment. May work in the following specialized areas: consumer electronics, computers, aircraft electronics, broadcasting, biomedical equipment, audio-visual equipment, cable TV, industrial electronics, telecommunications, marine navigation equipment, musical instrument repair, radar equipment, office equipment, quality control and others.

ENVIRONMENT

Environmental Studies & Natural Resources (B) – interdisciplinary in nature and provide a background for understanding environmental relationships and issues, the interactions between human activity and the natural world, and possible solutions to environment problems. Graduates work in leadership roles with industry, government, and public concern groups.

Environmental Technology (D, A) – This line of work involves prevention and control of environmental pollution. Their work may involve water purification; sewage collection, treatment, and disposal; industrial wastewater treatment; or evaluation of air, water, soil, or food samples.

Fisheries and Wildlife (B, M) – with an understanding of biology, zoology, and other sciences related to natural resources, individuals apply this knowledge to the conservation and management of fish and wildlife.

Forest Products (B) – work in the development, production, marketing, and use of the materials produced in forests, everything from paper, wood-based panels, and furniture to chemicals made from wood. They may work with the sales, marketing, and distribution of forest products at the wholesale or retail level, including lumber, plywood, fiberboard, particleboard, and new composite products

Forest Resources (B) – this would involve the ability to plan, implement, and research the management, protection, and sustainable use of forest and related resources including timber, water, wildlife, recreation, and aesthetics.

Recreation Resources Management (B) – comprehensive planning and management of land and water for recreation with emphasis on natural and managed non-urban areas; for administration of natural resource-oriented recreation programs in public and private sectors. An emphasis can be placed on understanding social science aspects of natural resources use, and developing skills in communication and planning.

Urban Forestry (B, M) – plan and manage vegetation and associated natural resources in and near urban and rural communities. This typically includes considerations of forest, water, wildlife, and recreational and aesthetic values.

GEOLOGICAL

Geological Engineer (B) – applies science and engineering principles to the planning, analysis, design, construction, and operation of facilities on and under the earth's surface.

Geologist (M, P) – investigates foundations for all types of structures, including dams, bridges, buildings, and roads; analyze and design underground excavations, such as mining excavations and underground storage facilities and buildings; analyze and design surface excavations; including road cuts, surface mines, and quarries, pipelines, and earthen dams; investigate and develop water resources; develop remedial measures for environmental contamination; evaluate natural hazards (floods, landslides, and earthquakes) and geological resources (minerals, geothermal energy resources, and potable water).

LANDSCAPE DESIGN

Landscape Architecture (M) – design, plan, and manage land. Design outdoor areas with the goal of making them attractive and functional, while considering the natural features of the site (e.g. soil type, topographical conditions, amount of sunlight). They may also develop a policy for a region, or analyze the environmental impact of a proposed development.

Landscape Technology (C, D, A) – select, plant, and maintain trees, shrubs, and flowers for use around homes, commercial buildings, streets, roadsides, parks and arboretums, golf courses, institutions, and other public areas.

MANUFACTURING AND INDUSTRIAL ENGINEERING

Industrial Engineering (B) – determine the most effective ways of using the basic components of production, which include personnel, machines, and materials. Industrial engineers design plant facilities, human-machine systems, information systems, production and materials-handling system, and computer-controlled systems. Their goals are to meet the needs and abilities of the industries and workers using a system in a cost-effective manner

Industrial Technology (D, A B) – coordinate production activities for the efficient use of personnel and materials. They may be involved in planning the layout of machinery, equipment, and personnel; guiding workflow and material handling; ensuring industrial safety; and determining wage rates through time and motion studies.

Manufacturing Engineering Technology (A, B) – organize equipment, materials, and personnel for efficient, safe, and high-quality production of goods. They apply technology to new and existing products or equipment; modify designs in manufacturing; work in scheduling, operations control, quality control, and productivity, and testing; supervise production, manage and training personnel; and work in marketing, sales and field service.

Mechanical Engineering Technology (A, B) – involves the design and control of manufacturing processes, machinery and systems; energy conversion; transfer and utilization of heat; computer-controlled automation; and optimization of processes and products as they relate to function, people, and cost. Mechanical engineering technologists design components and products, refining the design for success in actual production. They determine accurate dimensions, manufacturing procedures, production schedules, and costs. They also work in testing, maintenance, field service, and sales.

Quality Control Technology (A) – Quality control technicians determine the quality and safety of manufactured or processed items by using instruments, which combine mechanical, electrical, and optical testing and measuring functions. They collect, interpret, and record data in graphs, charts, and reports, so they can evaluate production or processing procedures. Testing is done to discover imperfections; determine structure, composition, or characteristics; or measure geometric properties without changing the material tested. They may make recommendations on how to reduce costs, increase productivity, and improve product quality.

MATERIALS

Materials Engineering (B) – deal with problems and issues concerning the properties of materials, including metals, plastics, and ceramics. Almost all manufacturing involves materials of some kind, either in goods being produced or the equipment needed to produce them. Materials engineers are often challenged to select a particular combination of materials to do a specific job, or to develop new materials to meet needs. Examples of projects include: creating new alloys with better fatigue, fracture, or corrosion properties for aircraft; developing high strength steels and ceramics for more efficient automobile engines; and selecting corrosion resistant alloys to contain chemical reactions in the chemical industry; developing new semiconductor materials for electronic circuits.

MECHANICAL ENGINEERING AND TECHNOLOGY

Automotive Engineer Technology (D, A, B) – involves the design, development, testing, manufacturing, and maintenance of vehicles and their parts for use in transportation systems.

Drafting and Design Technology (A) – drafters make precise drawings of anything that is manufactured or built, showing exact dimensions and specifications of each part. They work from rough sketches, specifications, and calculations of scientists, engineers, or architects, translating them into working plans used by the skilled craftsperson to make the product or construct the building. Drafters may also calculate the strength, quality, and cost of materials. Drafters may use traditional tools, such as drawing boards, compasses, triangles, and protractors, or may use computer-aided design (CAD) systems.

Fluid Power Technology (D, A) – involves using pumped or compressed liquid (hydraulics) or air (pneumatics) to drive mechanical devices and equipment. Fluid power technicians design, manufacture, test, install, operate, service, and sell fluid power systems and components. They may work with pumps, motors, cylinders, compressors, and valves on equipment such as industrial machines; airplanes, ships, other vehicles, and robotics.

Robotics/Automated Systems Technology (A) – Robotics or automated systems technicians install, program, and maintain robot system for a variety of industrial uses. They also assist in the design, development, production, and testing of automated systems. The technician applies knowledge of computer programming, mechanical and electrical devices, and manufacturing processes. Technicians work in robot manufacturing, robot research and development, and in-plant applications engineering.

Mechanical Drafting and Design Technology (C, D, A) – Working from the rough sketches, specifications, and calculations of engineers, drafters make precise drawings, showing exact dimensions and specifications of each part. They assist in the designing and perfecting of machines, mechanical processes, and materials. They may also calculate the strength, quality, and cost of materials. Drafters may use tools, such as drawing boards, compasses, triangles, and protractors, or may use computer-aided design (CAD) systems.

Mechanical Engineering (B) – is concerned with mechanical design, energy conversion, fuel and combustion technologies, heat transfer, materials, noise control and acoustics, manufacturing processes, rail transportation, automatic control, product safety and reliability, solar energy, and technological impacts on society. Mechanical engineers are involved in the design, analysis, testing, production, and utilization of all types of mechanical equipment. They study how materials react when forces are applied to them, including the motion of solids, liquids, and gases, and heating and cooling of object and machines. Using this information, they design computers, power plants, robotic systems, automobiles, space vehicles, airplanes, furnaces, air conditioners, jet engines, medical equipment, and submarines. Anything that is mechanical or must interact with another machine or human being is within the scope of mechanical engineering.

Mechanical Engineering Technology (A, B) – The field of mechanical engineering involves the design and control of manufacturing processes, machinery, and systems; energy conversion; transfer and utilization of heat; computer-controlled automation; and optimization of processes and product as they relate to function, people, and cost. Mechanical engineering technologists design components and products, refining the design for success in actual production. They determine accurate dimensions, manufacturing procedures, production schedules, and costs. They also work in testing, maintenance, field service, and sales.

METALLURGY

Metallurgical/Powder Metal Technology (D, A) – Metallurgical technicians work as laboratory assistants, technicians in research and development, or assistants to metallurgical engineers. Their work involves using microscopic, x-ray, photographic, and other techniques to test metal samples for impurities and defects, or to determine strength, elasticity, and other properties. Technicians may polish, etch, photograph, and mount samples, or use magnetic and pressure devices.

SCIENCE AND MATHEMATICS

Biologist (B, M, P) – biology is the study of living organisms. Some areas of career options include agriculture, environmental biology, research, health careers, education, forensic science, and information systems.

Chemistry (B, M, P) – chemistry deals with matter – what substances are made of, their properties, and how they interact. Chemistry is central to research in important new areas, such as superconductivity, biotechnology, polymers, and new materials for electronics. Chemists synthesize new materials and learn to use known materials in new ways. For example, a chemist may be the first to prepare a new compound with an important property such as high heat stability, to unravel the structure of a complex molecule in a cancer cell. Chemists engage in a variety of activities, from collecting field samples to writing for journals, and have varying levels of responsibility as managers, lab supervisors, researchers, or technicians. Chemists are often employed in non-traditional roles such as technical librarians, patent lawyers, and teachers.

Mathematics (B, M, P) – There are several types of careers in business, industry, government, and education for individuals with mathematics degrees. Three major areas of employment are: 1) actuarial and statistics professions, 2) computers and industrials applied mathematics, and 3) teaching. Actuaries are experts in the design, financing, and operations of life, health, and casualty insurance and pension plans. They use math skills to evaluate the financial risks that companies take in offering various insurance and pension plans to determine appropriate prices. Other areas of employment for those with a background in probability and statistics are marketing research, quality control, social science research, and health statistics. There are positions in the computer field for math majors that are distinct from computer science majors. An example is a numerical simulation of aerodynamic properties of airplane wings.

Physics (B, M, P) – Most modern technology is based on physics. Physics involves describing how the physical world works – its most fundamental properties. Physicists examine the relationships among space, time, matter, and energy. Many physicists work in laboratories, or in development and design; they may be involved in the areas of acoustics, astrophysics, biophysics and medicine, chemical physics, geophysics, low temperature physics (including superconductivity and superfluidity), atomic and nuclear physics, optics, particle physics, condensed matter physics, vacuum physics, mechanics, electricity and magnetism, and thermodynamics. Physicists may also teach at the high school or college level.