

## HIGH-DEMAND/CRITICAL OCCUPATIONS

*Aerospace Engineering ∞ Budget Analyst ∞ Computer Engineering ∞ Computer Systems Analyst ∞ Financial Management ∞ Industrial Engineering ∞ Information Technology ∞ Logistics ∞ Network/Computer Systems ∞ Nuclear Engineering ∞ Occupational Therapy ∞ Personnel Management ∞ Physical Therapy ∞ Software Engineering ∞ Technical Writing*

Many workers are going to be needed in these occupations over the next few years. It is not too late to begin preparing now for one of these exciting careers. Most of these careers require a 4-year college degree. NACC offers courses to fulfill the requirements of the first two years, and then students transfer to a 4-year college to obtain a bachelor's degree or higher degree that will qualify them for one of these occupations. Please consult the Transfer Guide section in the NACC Catalog for more details.

**You may prepare for a high demand/critical occupation by pursuing a particular Transfer Guide at NACC. These are in the Mathematics Division. Contact Greg Millican (millicang@nacc.edu) for more information. Office: MT225, phone extension 2263.**

### Aerospace Engineering Degree Requirement: B.S.

**Aerospace engineers** design, develop, and test aircraft, spacecraft, and missiles and supervise the manufacture of these products. Those who work with aircraft are called aeronautical engineers, and those working specifically with spacecraft are astronautical engineers. Aerospace engineers develop new technologies for use in aviation, defense systems, and space exploration, often specializing in areas such as structural design, guidance, navigation and control, instrumentation and communication, or production methods. They also may specialize in a particular type of aerospace product, such as commercial aircraft, military fighter jets, helicopters, spacecraft, or missiles and rockets, and may become experts in aerodynamics, thermodynamics, celestial mechanics, propulsion, acoustics, or guidance and control systems. **NACC Transfer Guide: Engineering—Aerospace**

### Computer Engineering Degree Requirement: B.S.

**Computer hardware engineers** research, design, develop, test, and oversee the manufacture and installation of computer hardware. Hardware includes computer chips, circuit boards, computer systems, and related equipment such as keyboards, modems, and printers. The work of computer hardware engineers is very similar to that of electronics engineers in that they may design and test circuits and other electronic components, but computer hardware engineers do that work only as it relates to computers and computer-related equipment. The rapid advances in computer technology are largely a result of the research, development, and design efforts of these engineers. **NACC Transfer Guide: Engineering—Computer**

### Electrical Engineering Degree Requirement: B.S.

**Electrical engineers** design, develop, test, and supervise the manufacture of electrical equipment. Some of this equipment includes electric motors; machinery controls, lighting, and wiring in buildings; automobiles; aircraft; radar and navigation systems; and power generation, control, and transmission devices used by electric utilities. Although the terms electrical and electronics engineering often are used interchangeably in academia and industry, electrical engineers have traditionally focused on the generation and supply of power, whereas electronics engineers have worked on applications of electricity to control systems or signal processing. Electrical engineers specialize in areas such as power systems engineering or electrical equipment manufacturing. **NACC Transfer Guide: Engineering—Electronics**

### Electronics Engineering Degree Requirement: B.S.

**Electronics engineers**, except computer are responsible for a wide range of technologies, from portable music players to the global positioning system (GPS), which can continuously provide the location, for example, of a vehicle. Electronics engineers design, develop, test, and supervise the manufacture of electronic equipment such as broadcast and communications systems. Many electronics engineers also work in areas closely related to computers. However, engineers whose work is related exclusively to computer hardware are considered computer hardware engineers. Electronics engineers specialize in areas such as communications, signal processing, and control systems or have a specialty within one of these areas—control systems or aviation electronics, for example. **NACC Transfer Guide: Engineering—Electrical**

### Industrial Engineering Degree Requirement: B.S.

**Industrial engineers** determine the most effective ways to use the basic factors of production—people, machines, materials, information, and energy—to make a product or provide a service. They are primarily concerned with increasing productivity through the management of people, methods of business organization, and technology. To maximize efficiency, industrial engineers carefully study the product requirements and design manufacturing and information systems to meet those requirements with the help of mathematical methods and models. They develop management control systems to aid in financial planning and cost analysis, and design production planning and control systems to coordinate activities and ensure product quality. They also design or improve systems for the physical distribution of goods and services and determine the most efficient plant locations. Industrial engineers develop wage and salary administration systems and job evaluation programs. Many industrial engineers move into management positions because the work is closely related to the work of managers. **NACC Transfer Guide: Engineering—Industrial**

### Veterinary Medicine Degree Requirement: D.V.M.

Doctors of Veterinary medicine (DVM's) are dedicated to animal welfare. Veterinary doctors diagnose and treat diseases

and injuries in animals. They also prevent the spread of disease from and animals to humans. Veterinarians treat animals such as cats, dogs, and birds; domestic animals such as horses, cattle, and sheep; wild animals; or marine life. Veterinarians sometimes work in public health to supervise the care of laboratory animals. **NACC Transfer Guide: Any program to obtain an adequate science and math background. See the Advisor.**

**\*Note: General Engineering is designated as a high demand job. A student interested in engineering may choose from a Transfer Guide listed above or from: Chemical Engineering, Civil Engineering, Computer Engineering, Computer Engineering with a Computer Science Option, Materials Engineering, Mechanical Engineering, or Textile Chemistry.**

**The following Transfer Guides at NACC lead to college majors that prepare the student for other high demand/critical occupations. These transfer programs are available in the Division of Natural Sciences. Contact Rodney Land ([landr@nacc.edu](mailto:landr@nacc.edu)) for more information. Office: MT223, phone extension 2270.**

### **Majors Requiring a Bachelors, Masters or Doctoral Degree**

#### **Chemical Engineering**

Chemical engineers apply the principles of chemistry to solve problems involving the production or use of chemicals and biochemicals. They design equipment and processes for large scale chemical manufacturing, plan and test methods of manufacturing products and treating by products, and supervise production. Chemical engineers also work in a variety of manufacturing industries other than chemical manufacturing, such as those producing energy, electronics, food, clothing, and paper. They also work in health care, biotechnology and business services. They must be aware of all aspects of chemicals manufacturing and how the manufacturing process affects the environment and the safety of workers and consumers. NACC offers a two year program to prepare students to transfer to a four year school in chemical engineering. A B.S. degree is required for entry level chemical engineering jobs. **NACC Transfer Guide: Engineering—Chemical**

#### **Environmental Science**

Environmental science and protection technicians perform laboratory and field tests to monitor environmental resources and determine the contaminants and sources of pollution in the environment. They may collect samples for testing or be involved in abating and controlling sources of environmental pollution. Some are responsible for waste management operations to control and manage hazardous materials. To prepare for a four year curriculum in environmental science a two year program in biology or chemistry would be appropriate. **NACC Transfer Guide: Biology, Chemistry or Environmental Science**

#### **Occupational Therapy**

Occupational therapists help patients improve their ability to perform tasks in living and working environments. They work with individuals who suffer from a mentally, physically, developmentally, or emotionally disabling condition. Occupational therapists use treatments to develop, recover, or maintain the daily living and work skills of their patients. The therapist helps clients not only to improve their basic motor functions and reasoning abilities, but also to compensate for permanent loss of function. The goal is to help clients have independent, productive, and satisfying lives. Occupational therapists help clients to perform all types of activities, from using a computer to caring for daily needs such as dressing, cooking, and eating. Physical exercises may be used to increase strength and dexterity, while other activities may be chosen to improve visual acuity or the ability to discern patterns. For example, a client with short-term memory loss might be encouraged to make lists to aid recall, and a person with coordination problems might be assigned exercises to improve hand-eye coordination. Occupational therapists also use computer programs to help clients improve decision-making, abstract-reasoning, problem-solving, and perceptual skills, as well as memory, sequencing, and coordination—all of which are important for independent living. **NACC Transfer Guide: Pre-Occupational Therapy**

#### **Physical Therapy**

Physical therapists provide services that help restore function, improve mobility, relieve pain, and prevent or limit permanent physical disabilities of patients suffering from injuries or disease. They restore, maintain, and promote overall fitness and health. Their patients include accident victims and individuals with disabling conditions such as low-back pain, arthritis, heart disease, fractures, head injuries, and cerebral palsy. Therapists examine patients' medical histories and then test and measure the patients' strength, range of motion, balance and coordination, posture, muscle performance, respiration, and motor function. Physical therapists develop plans describing a treatment strategy and its anticipated outcome. Most Physical Therapy programs now require three years of professional school after completing a BS degree in an area that includes the following courses: English Composition - ENG 101, 102 (6 hrs), Psychology, PSY 200, 210 (6 hrs) Pre-calculus with Trigonometry, MTH 113 (3 hrs), Statistics, MTH 265 (3 hrs) Physics, PHY 201 & 202 (8 hrs), General Chemistry for science majors with labs, CHM 111 & 112 (8 hrs) Biology including Human or Mammalian Physiology\* - BIO 103, 104, 201, 202 (16 hrs). The BS degree could be in a number of areas but the above courses must be included in order to apply to PT school. **NACC Transfer Guide: Any of the Sciences or Pre-Physical Therapy**

#### **Radiological Science Protection**

The Radiation Protection program is in compliance with federal, state, and company regulations in the areas of monitoring personal internal and external radiation exposure, radioactive waste packaging and shipment, radioactive source control, and

instrumentation. The primary duties in Radiological Protection are to be responsible for the maintenance and coordination of the Radiation Protection programs including: Unconditional Release, Radioactive Source Control, RP Instrumentation, and Radioactive Material Controls; to participate in Business Planning, Budget, and Business Performance review regarding site and Fleet; ensure consistent and effective work force practices through assigned supervisors/functions; maintain the internal and external dosimetry program and records; be responsible for the management of the Radioactive Waste Shipping Program. To apply for a position in Radiological Science one should have Bachelor's degree in Health Physics or equivalent B.S. Degree. NACC offers a two year program in Radiological Science that would prepare for transfer to a 4 year program. **NACC Transfer Guide: Radiologic Sciences**

**The following Transfer Guides at NACC lead to college majors that prepare the student for other high demand/critical occupations. These Transfer Guides are available in the Division of Business and Computer Science. Contact Hayley Johnson ([johnsonh@nacc.edu](mailto:johnsonh@nacc.edu)) for more information. Office: 109-C Business Education Building, phone extension 2247.**

**Budget Analyst Degree Requirement: B.S.**

Efficiently distributing limited financial resources is an important challenge in all organizations. In most large and complex organizations, this task would be nearly impossible without budget analysts. These workers develop, analyze, and execute budgets, which are used to allocate current resources and estimate future financial needs. Budget analysts work in private industry, nonprofit organizations, and the public sector. In private sector firms, a budget analyst's main responsibility is to examine the budget and seek new ways to improve efficiency and increase profits. In nonprofit and governmental organizations, which usually are not concerned with profits, analysts try to find the most efficient way to distribute funds and other resources among various departments and programs. **NACC Transfer Guide: Business**

**Financial Management Degree Requirement: B.S.**

Almost every firm, government agency, and other types of organizations have one or more financial managers. Financial managers oversee the preparation of financial reports, direct investment activities, and implement cash management strategies. Managers also develop strategies and implement the long-term goals of their organization. The duties of financial managers vary with their specific titles, which include controller, treasurer or finance officer, credit manager, cash manager, risk and insurance manager, and manager of international banking. *Controllers* direct the preparation of financial reports, such as income statements, balance sheets, and analyses of future earnings or expenses, that summarize and forecast the organization's financial position. Controllers also are in charge of preparing special reports required by regulatory authorities. Often, controllers oversee the accounting, audit,

and budget departments. *Treasurers* and *finance officers* direct the organization's budgets to meet its financial goals. They oversee the investment of funds, manage associated risks, supervise cash management activities, execute capital-raising strategies to support a firm's expansion, and deal with mergers and acquisitions. *Credit* managers oversee the firm's issuance of credit, establishing credit-rating criteria, determining credit ceilings, and monitoring the collections of past-due accounts. **NACC Transfer Guide: Business**

**Information Technology Degree Requirement: B.S.**

Information systems managers plan, coordinate, and direct research and facilitate the computer-related activities of firms. They help determine both technical and business goals in consultation with top management and make detailed plans for the accomplishment of these goals. This requires a strong understanding of both technology and business practices. Computer and information systems managers direct the work of systems analysts, computer programmers, support specialists, and other computer-related workers. They plan and coordinate activities such as installation and upgrading of hardware and software, programming and systems design, development of computer networks, and implementation of Internet and intranet sites. They are increasingly involved with the upkeep, maintenance, and security of networks. They analyze the computer and information needs of their organizations from an operational and strategic perspective and determine immediate and long-range personnel and equipment requirements. They assign and review the work of their subordinates and stay abreast of the latest technology to ensure the organization does not lag behind competitors. **NACC Transfer Guide: Computer Science/Business**

**Logistics Degree Requirement: B.S.**

Trucking and warehousing firms provide logistical services encompassing the entire transportation process. Firms that offer these services are called third-party logistics providers. Logistical services manage all aspects of the movement of goods between producers and consumers. Among their value-added services are sorting bulk goods into customized lots, packaging and repackaging goods, controlling and managing inventory, order entering and fulfillment, labeling, performing light assembly, and marking prices. Some full-service companies even perform warranty repair work and serve as local parts distributors for manufacturers. Some of these services, such as maintaining and retrieving computerized inventory information on the location, age, and quantity of goods available, have helped to improve the efficiency of relationships between manufacturers and customers. **NACC Transfer Guide: Computer Science/Business**

**Network/Computer Systems Degree Requirement: B.S.**

All organizations today rely on computer and information technology to conduct business and operate more efficiently. Often, however, these institutions do not have the internal resources to effectively implement new technologies or satisfy

their changing needs. When faced with such limitations, organizations turn to the computer systems design and related services industry to meet their specialized needs. Services provided by this industry include custom computer programming services; computer systems design services; computer facilities management services, including computer systems or data processing facilities support services; and other computer-related services such as disaster recovery and software installation. **NACC Transfer Guide: Computer Science**

**Personnel Management Degree Requirement: B.S.**

Every organization wants to attract the most qualified employees and match them to jobs for which they are best suited. However, many enterprises are too large to permit close contact between top management and employees. Human resources, training, and labor relations managers and specialists provide this connection. In the past, these workers performed the administrative function of an organization, such as handling employee benefits questions or recruiting, interviewing, and hiring new staff in accordance with policies established by top management. Today's human resources workers manage these tasks, but, increasingly, they also consult with top executives regarding strategic planning. They have moved from behind-the-scenes staff work to leading the company in suggesting and changing policies. In an effort to enhance morale and productivity, limit job turnover, and help organizations increase performance and improve business results, these workers also help their firms effectively use employee skills, provide training and development opportunities to improve those skills, and increase employees' satisfaction with their jobs and working conditions. Although some jobs in the human resources field require only limited contact with people outside the human resources office, dealing with people is an important part of the job. **NACC Transfer Guide: Business**

**Majors Requiring an Associates Degree**

- Diagnostic Imaging**
- Medical Sonography**
- Occupational Therapy Assistant**
- Physical Therapy Assistant**
- Radiologic Technologist**

**Contact Dr. Sharon Totten (tottens@nacc.edu) for more information. Office: 100 Wallace Administration Building (WA), phone ext. 2245.**

The sources for the identification of high demand-critical occupations are the following: Alabama Workforce Report III, Center for Business and Economic Research, Culverhouse College of Commerce, University of Alabama, August 2008. BRAC Workforce Analysis, Center for Management of Science and Technology, UA Huntsville, May 2008. Tennessee Valley Authority, [www.tva.gov/Occupational](http://www.tva.gov/Occupational) Outlook Handbook, U. S. Bureau of Labor Statistics, 2008.

This list of high demand careers is not exhaustive. There are other occupational areas that are expected to grow faster than the average. Go to <http://www.bls.gov/search/oooh.htm/> to research specific occupations and their job prospects or visit the College and Career Planning Center in the Wallace Administration Building.

**Nursing is another high-demand/critical occupation. NACC offers programs leading to the LPN and RN. For more information contact Mrs. Jane Hopson, Director of Nursing (hopsonj@nacc.edu) Office: 221 Health Education Building, phone extension 2316.**



**TRANSFER GUIDES: ASSOCIATE IN ARTS DEGREE AND ASSOCIATE IN SCIENCE DEGREE**

Students should be reminded that most all required courses can be completed at Northeast for practically all programs of study listed on the STARS website. Our listing of programs of study is simply a compilation of some of the more popular options. Following is a comprehensive list of majors from the STARS program.

Advertising (UA only)	Family and Consumer Sciences (JSU only)	Music Education: Middle/High School
Agribusiness Economics (AA&MU only)	Family and Consumer Sciences (UM only)	Nuclear Medicine Technology (UAB only)
Agricultural Economics (AU only)	Fisheries Science (AU only)	Nursing
Agriscience Education (AU only)	Food and Nutrition (UA only)	Nutrition (AU only)
Agronomy and Soils (AU only)	Foreign Language	Philosophy
Animal/Dairy Science	Forest Management/Forest Science (AA&MU only)	Physical Education
Anthropology	Forestry (AU only)	Physics
Apparel and Textiles (UA only)	French Education: Middle/High School	Physics Education: Middle/High School
Apparel Merchandising, Design, & Production Management (AU only)	General Science Education: Middle/High School	Political Science
Applied Mathematics (AU only)	General Studies in Human Environmental Sciences (UA only)	Poultry Science (AU only)
Architecture (AU only)	Geography	Pre-Dentistry
Art Education	Geography Education: Middle/High School	Pre-Law
Art History, B.A.	Geology	Pre-Medicine
Art Studio, B.A.	German Education: Middle/High School	Pre-Occupational Therapy
Art Studio, B.F.A.	Graphic Design (AU only)	Pre-Optometry
Athletic Training	Health Education: Middle/High School	Pre-Pharmacy
Behavioral Science	Health Information Management (UAB only)	Pre-Physical Therapy
Biology	Health Science (Athens only)	Pre-Veterinary Medicine
Biology Education: Middle/High School	Health Sciences (UAB only)	Psychology
Biomedical Sciences (USA only)	Health Services Administration (AU only)	Public Administration (AU only)
Building Science (AU only)	Health, PE & Recreation (UNA only)	Public Relations
Business (All Business Majors)	History	Public Safety & Health Administration (Athens only)
Business Education: Middle/High School	History Education: Middle/High School	Radiologic Sciences (USA only)
Career Technical Education (Athens only)	Horticulture (AU only)	Recreation Leadership (JSU only)
Chemistry	Hotel & Restaurant Management (AU only)	Rehabilitation, non-certification (Troy only)
Chemistry Education: Middle/High School	Human Development and Family Studies (AU only)	Religious Studies
Clinical Lab Sciences/Medical Tech	Human Development and Family Studies (UA only)	Respiratory Therapy/Cardio Science
Communication Studies or Speech	Human Environmental Sciences (UNA only)	Restaurant and Hospitality Management (UA only)
Computer Science	Human Services (Troy only)	Social Science
Consumer Sciences (UA only)	Industrial Design (AU only)	Social Studies Education: Middle/High School
Criminal Justice	Industrial Hygiene (UNA only)	Social Work
Dance (UA only)	Information Systems (USA only)	Sociology
Economics, B.A.	Information Technology (USA only)	Spanish Education: Middle/High School
Elementary or Early Childhood Education	Interdisciplinary Arts (UWA only)	Special Education
Emergency Management (JSU only)	Interior Architecture (AU only)	Speech Pathology
Engineering—Aerospace	International Studies	Sport & Fitness Management (Troy only)
Engineering—Biomedical (UAB only)	Interpreter Training (Troy only)	Surveying and Geomatic Science (Troy only)
Engineering—Biosystems (AU only)	Journalism	Technology, Industrial Technology or Engineering Technology
Engineering—Chemical	Laboratory Technology (AU only)	Telecommunication and Film or Broadcasting
Engineering—Civil	Math Education: Middle/High School	Textile Management and Technology (AU only)
Engineering—Computer Engineering	Mathematics	Theatre
Engineering—Computer Science	Meteorology (USA only)	Wildlife Sciences (AU only)
Engineering—Electrical	Music	
Engineering—Industrial		
Engineering—Materials		
Engineering—Mechanical		
English		
English/Language Arts Education: Middle/High School		
Environmental Science		
Environmental Science (AU only)		
Exercise Science and Wellness (JSU only)		