North Dakota’s Career Clusters and Pathways

**Agriculture, Food & Natural Resources**

The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.

---

**Agribusiness Systems Pathway:** Agribusiness is the coordination of activities that contribute to the marketing, financing and development of agricultural commodities and resources. It is a high-tech industry that uses innovation to increase efficiency and profitability.

**Animal Systems Pathway:** People in this pathway develop better, more efficient ways of producing and processing meat, poultry, eggs and dairy products. They study genetics, nutrition, reproduction, growth and development of domesticated farm animals.

**Environmental Service Systems Pathway:** Water and air pollution control, recycling, waste disposal and public health issues are concerns within this pathway. Workers analyze scientific data, research environmental projects and develop quality control procedures.

**Food Products and Processing Systems Pathway:** This pathway includes the discovery of new food sources, and the processing, packaging and food storage based on industry and government regulations.

**Natural Resources Systems Pathway:** People working in this pathway develop, maintain, manage and protect the natural environment. This includes forest and rangelands, minerals and water, and wildlife habitats.

**Plant Systems Pathway:** Helping producers of food, feed and fiber crops feed a growing population while conserving natural resources and maintaining the environment is a top priority in this pathway. Individuals also develop ways to improve the nutritional value of crops and the quality of seeds.

**Power, Structural and Technical Systems Pathway:** This pathway is focused on the knowledge of engineering, hydraulics, pneumatics, electronics, power, structures, and controls within the field of agriculture. Workers design agricultural structures as well as machinery and equipment.

---

**Architecture & Construction**

Designing, planning, managing, building and maintaining the built environment.

---

**Construction Pathway:** Workers in this pathway build and remodel houses, apartments, industrial buildings, warehouses, office buildings, churches, schools and recreational facilities. This pathway includes the builders of highways, bridges, airports, power plants, refineries and mills.

**Design/Pre-Construction Pathway:** Employees in design/pre-construction create our future! They turn a concept into a set of plans. Their plans guide other construction professionals as they continue the building process.

**Maintenance/Operations Pathway:** Employees in maintenance/operations determine the optimal placement of machines in a plant, assemble machinery, install machinery and perform preventive maintenance. They maintain the smooth operation of refineries, power plants, chemical plants and mills.

Find more Career Cluster Information at [https://careertech.org](https://careertech.org)
Arts, A/V Technology & Communications

Designing, producing, exhibiting, performing, writing, and publishing multimedia content including visual and performing arts and design, journalism, and entertainment services.

A/V Technology & Film Pathway: Individuals present sound, video and data in such venues as corporate boardrooms, hotels, convention centers, theme parks, stadiums and museums. The major activity sectors are service firms such as AV dealers, rental companies, and communications products.

Journalism and Broadcasting Pathway: News reporters and correspondents gather information and write stories that inform us about events. Broadcast and sound technicians install, repair, and operate the electronic equipment used to record and transmit radio and television programs.

Performing Arts Pathway: Theatrical production companies coordinate all aspects a play or theater event. Lighting and stage crews handle the technical aspects of productions. Dance studios provide places for dancers to learn, practice, and perform.

Printing Technology Pathway: Workers transform text and pictures into finished pages and make printing plates of the pages. The printing industry is rapidly moving toward complete “digital imaging,” by which customers’ material received digitally is converted directly into printing plates.

Telecommunications Pathway: Telecommunications specialists focus on the interaction between computer and communications equipment. Telecommunications equipment is computerized and can communicate a variety of information, including data, graphics and video.

Visual Arts Pathway: Visual artists create art to communicate ideas, thoughts or feelings. They use a variety of methods—painting, sculpting, illustrating—and an assortment of materials, including oils, watercolors, acrylics, pastels, pencils, pen and ink, photography, plaster, clay and computers.

Business Management & Administration

Planning, organizing, directing and evaluating business functions essential to efficient and productive business operations.

Administrative Support Pathway: Business operations are facilitated through a variety of administrative and clerical duties including information and communication management, data processing and collection, and project tracking.

Business Information Management Pathway: Business Information Management is an umbrella term covering careers that provide a bridge between business processes/initiatives and Information Technology.

General Management Pathway: This pathway focuses on careers that plan, organize, direct, and evaluate all or part of a business organization through the allocation and use of financial, human, and material resources.

Human Resources Management Pathway: This pathway focuses on the staffing activities that involve planning, recruitment, selection, orientation, training, performance appraisal, compensation, and safety of employees.

Operations Management Pathway: The planning, organizing, coordinating and controlling of the resources needed to produce/provide a business’s goods and/or services.
**Education & Training**
Planning, managing and providing education and training services, and related learning support services.

**Administration and Administrative Support Pathway:** Smooth operation of any education or training institution requires competent administration. Administrators provide direction, leadership and management of educational activities in schools, daycare centers, colleges and universities.

**Professional Support Services Pathway:** This pathway represents a variety of highly specialized occupations that are critical to our education and training systems. Counselors, psychologists, social workers, speech-language pathologists and audiologists assist people with personal and family needs, mental health assistance, educational goals and career decision making.

**Teaching and Training Pathway:** Teachers and trainers must be knowledgeable in their subject area and have the ability to communicate, motivate learners, and understand educational and emotional needs. Teachers must be able to recognize and respond to individual differences and employ different teaching/training methods.

**Finance**
Planning, services for financial and investment planning, banking, insurance, and business financial management.

**Accounting Pathway:** Accounting encompasses careers that record, classify, summarize, analyze, and communicate a business's financial information/business transactions for use in management decision-making. Accounting includes bookkeeping, systems design, analysis, and interpretation of information.

**Banking Services Pathway:** Workers in this pathway accept deposits, lend funds, and extend credit to customers. Other services include cash management, mortgages and other loans, and credit cards. Services are delivered through commercial banks, savings and loans associations, credit unions, and local banks.

**Business Finance Pathway:** The business finance function in a company is to manage policy and strategy for the implementation of capital structure, budgeting, acquisition and investment, financial modeling and planning, funding, dividends, and taxation.

**Insurance Pathway:** The insurance industry, which exists to protect individuals and businesses from financial losses, delivers services that transfer risk from an individual or business to an insurance company.

**Securities and Investments Pathway:** The securities and investments industry consists of brokerage firms, investment banks, and stock exchanges, all of which support the flow of funds from investors to companies and institutions.

Find more Career Cluster Information at [https://careertech.org](https://careertech.org)
**Government & Public Administration**

Planning and performing government functions at the local, state and federal levels, including governance, national security, foreign service, planning, revenue and taxation, and regulations.

**Foreign Service Pathway:** People who work in the Foreign Service pathway serve in embassies, consulates and other diplomatic missions located around the world and in Washington, D.C. Job responsibilities include analyzing political and economic events and helping American citizens abroad.

**Governance Pathway:** This pathway includes the officials elected or appointed to government positions. This pathway includes the President and members of Congress, governors and state legislators, and local elected officials.

**National Security Pathway:** Maintaining strong national security encompasses diverse activities such as commanding a tank, programming computers, operating a nuclear reactor, or repairing and maintaining a helicopter. The military provides training and work experience in these fields and many others.

**Planning Pathway:** People working in this pathway develop long- and short-term land use plans to provide for growth and revitalization of urban, suburban and rural communities, while helping local officials make decisions concerning social, economic and environmental issues.

**Public Management and Administration Pathway:** Government agencies and corporations have rigorous standards for the stewardship of public resources. Public management careers require technical skills and specific knowledge of the regulations that govern public management.

**Regulation Pathway:** Technical knowledge about an industry, the environment or technology is needed for this pathway. This, coupled with an understanding of laws and rules, permit regulators to protect our health, safety and environment as well as ensure the integrity of our financial, transportation and public utility industries.

**Revenue and Taxation Pathway:** Those employed in the Revenue and Taxation pathway ensure that governments obtain revenues from businesses and citizens by collecting tax dollars, reviewing tax returns, conducting audits, and collecting overdue tax dollars.

---

**Health Science**

Planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.

**Biotechnology Research and Development Pathway:** Scientists may study diseases to discover new treatments or invent medical devices through bioscience research and development. These methods may be used to directly assist patients or to improve the accuracy of diagnostic tests.

**Diagnostic Services Pathway:** Tests and evaluations are used to aid in the detection, diagnosis and treatment of diseases, injuries or other physical conditions.

**Health Informatics Pathway:** This pathway includes health care administrators who manage health care agencies as well as those individuals who are responsible for managing all of the patient data and information, financial information, and computer applications related to health care procedures.

**Support Services Pathway:** Careers in this pathway provide a therapeutic environment for the delivery of health care. A full range of career opportunities from entry level to management, including technical and professional careers are available.

**Therapeutic Services Pathway:** The focus of this pathway is primarily on changing the health status of the patient over time. Health professionals in this pathway work directly with patients; they may provide care, treatment, counseling and health education information.

Find more Career Cluster Information at [https://careertech.org](https://careertech.org)
Hospitality & Tourism

The management, marketing and operations of restaurants and other food services, lodging, attractions, recreation events and travel related services.

Lodging Pathway: Employees perform tasks related to the operation of lodging facilities and the care of guests who use these facilities, either through direct guest contact or the provision of background services that enhance the guest experience.

Recreation, Amusements and Attractions Pathway: The work is exciting and diverse, yet can be demanding. Good customer service skills are essential for success. Employees must also understand what makes each operation unique.

Restaurants & Food/Beverage Services Pathway: A variety of tasks are performed to maintain operations and promote guest services in eating and drinking establishments.

Travel and Tourism Pathway: The development, research, promotion and delivery of a traveler's experiences are part of the broad range of jobs. Employees may be involved in developing a heritage area for the enjoyment and education of visitors, planning trips and events or managing a customer’s travel plans.

Human Services

Career pathways related to families and human needs such as counseling and mental health services, family and community services, personal care, and consumer services.

Consumer Services Pathway: People with careers in consumer services assist individuals with decisions and problems relating to finance, real estate, insurance and consumer goods.

Counseling and Mental Health Services Pathway: People with personal, family, educational, mental health, and career decisions are given assistance through counseling and mental health service providers. Care may be provided in hospitals, clinics, schools or private settings.

Early Childhood Development and Services Pathway: Early childhood development workers provide services in childcare centers, nursery schools, preschools, public schools, private households, and before- and after-school programs.

Family and Community Services Pathway: Employees working in this pathway help individuals cope with circumstances of daily living; counsel troubled individuals; train or retrain the unemployed, care for the elderly and the physically and mentally disabled.

Personal Care Services Pathway: Individuals are given assistance with their personal appearance, including styling hair; giving manicures and pedicures; facial treatments; providing makeup analysis; and providing personal fitness training. Also, funeral directors make funeral arrangements for grieving families.
Information Technology

Careers related to the design, development, support and management of hardware, software, multimedia and systems integration services.

Information Support and Services Pathway: Successful IT deployment — implementation of computer systems and software, provision of technical assistance, creation of technical documentation and management of information systems — is critical to the success of most 21st century organizations.

Network Systems Pathway: Network analysis, planning and implementation, design, installation, maintenance and management of network systems are included in this pathway. Individuals with expertise in network systems are in high demand for a variety of positions in organizations of all sizes and types.

Programming and Software Development Pathway: Knowledge of computer operating systems, programming languages and software development is required to design and develop computer systems and software. People with expertise in programming and software development work with cutting-edge technologies to develop tomorrow’s products for use by businesses and consumers.

Web and Digital Communications Pathway: Organizations use digital media for creating, designing and producing interactive multimedia products and services, including development of digitally-generated or computer-enhanced media used in business, training, entertainment, communications and marketing.

Law, Public Safety, Corrections & Security

Planning, managing, and providing legal, public safety, protective services and homeland security, including professional and technical support services.

Correction Services Pathway: Workers in this pathway are responsible for overseeing individuals who have been arrested, convicted of a crime and sentenced to serve time in a jail, reformatory, or penitentiary. While the primary mission of corrections is protection of the public, many in this field are involved with the treatment, education and reintegration of offenders.

Emergency and Fire Management Services Pathway: Every year, fires and other emergencies take thousands of lives and destroy property worth billions of dollars. Firefighters and emergency services workers help protect the public against these dangers by rapidly responding to a variety of emergencies. They are frequently the first emergency personnel at the scene of a traffic accident or medical emergency.

Law Enforcement Services Pathway: People depend on police officers and detectives to protect their lives and property. Law enforcement officers have duties that range from controlling traffic to preventing and investigating crimes. They enforce laws, investigate accidents, present evidence in court, and serve legal documents for the court system.

Legal Services Pathway: The legal system affects nearly every aspect of our society, from buying a home to crossing the street. Workers in the Legal Services pathway form the backbone of this vital system, linking it to society in a variety of ways. They hold positions of great responsibility and are obligated to adhere to a strict code of ethics.

Security and Protective Services Pathway: Security personnel often work in public buildings such as museums and large event facilities. People and packages entering and leaving the building are inspected for safety purposes. In factories, laboratories, government buildings, data processing centers, and military bases, security officers protect information and check the credentials of people and vehicles entering and leaving the premises.

Find more Career Cluster Information at https://careertech.org
**Manufacturing**
Planning, managing and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

**Health, Safety and Environmental Assurance Pathway:** Ensuring that equipment is being used safely in the workplace; planning for safety in new production processes; conducting health, safety and/or environmental incident and hazard investigations.

**Logistics and Inventory Control Pathway:** People with careers in Logistics and Inventory Control work with an inventory of raw materials and finished parts. They move raw materials to the production line, unload trucks with raw materials, wrap pallets of finished products for shipment, and communicate with traffic managers.

**Maintenance, Installation and Repair Pathway:** Employees troubleshoot and repair electrical, electronic and mechanical systems. This includes computer-based inventory control systems, retrieving information histories on each machine from computer records, and recording repair activities on the system to keep accurate records of repairs.

**Manufacturing Production Process Development Pathway:** Employees are responsible for product design and design of the manufacturing process. They work with customers to ensure the product meets or exceeds customer expectations. They also monitor the manufacturing process and the materials used to manufacture the product.

**Production Pathway:** People with careers in production work on the shop floor making parts or assembling them. They work with machines, making or assembling electronic parts, constructing or assembling modular housing, performing welding jobs, or printing various materials.

**Quality Assurance Pathway:** Employees ensure that standards and procedures are adhered to and products or services meet performance requirements. This could include identifying the raw product to ensure it meets specifications, as well as measuring or otherwise testing products and parts to ensure they meet required customer specifications.

**Marketing**
Planning, managing and performing marketing activities to reach organizational objectives.

**Marketing Communications Pathway:** Marketing communications employees plan, coordinate and implement marketing strategies advertising promotion and public relations activities. Because of the importance and high visibility of their jobs, these individuals often are prime candidates for advancement.

**Marketing Management Pathway:** People in marketing management formulate policies and direct the operations of businesses and corporations, nonprofit institutions and other organizations. The owner or chief executive officer may assume all advertising, promotions, marketing, sales and public relations responsibilities.

**Marketing Research Pathway:** Employees in marketing research are concerned with understanding people and organizations. They collect and analyze many different types of information to design new products, to predict future sales and to position their own company’s strategies against those of its competitors.

**Merchandising Pathway:** Employees in buying and merchandising positions get the product into the hands of the customer. This process includes forecasting, planning, buying, displaying, selling and providing customer service.

**Professional Sales Pathway:** Employees in professional sales are involved in the transfer of goods and services in the economy, both to businesses and to individual consumers.
Science, Technology, Engineering & Mathematics
Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.

Engineering and Technology Pathway: For a future in this pathway, students should study and apply principles from advanced mathematics, life sciences, physical science, earth and space science, and technology.

Science and Mathematics Pathway: Those who choose careers in this pathway apply essential mathematics and science content and skills in a real-world context. Science and mathematics occupations include those in physical, environmental and human endeavors.

Transportation, Distribution & Logistics
Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

Facility and Mobile Equipment Maintenance Pathway: The maintenance, repair, and servicing of vehicles and transportation facilities are part of Facility and Mobile Equipment Maintenance. The people in this pathway keep the equipment and machinery running while looking for more efficient, safe, and cost-effective ways to do so.

Health, Safety and Environmental Management Pathway: Assessment and management of risks associated with health, safety, and environmental issues are included in this pathway. The people employed in this important pathway research, plan and carry out activities to make our environment safer and cleaner.

Logistics Planning and Management Services Pathway: Careers in this pathway involve planning, management and control of the distribution of materials, products, and people. These people are responsible for ensuring that cargo arrives at the right location, on time, and in the safest, most economical manner.

Sales and Service Pathway: People employed in the Sales and Service pathway market and sell transportation services to new customers as well as the management of existing customer relationships and customer service. Transportation businesses move passengers and freight to meet customer needs and demands.

Transportation Operations Pathway: These are the people that drive or pilot the vehicles that transport people and freight. Equally important to this pathway are the support people who ensure that any cargo transport is safe, secure, and on time.

Transportation Systems/Infrastructure Planning, Management and Regulation Pathway: Careers in this pathway deal with all aspects of the design and operation of our public transportation systems – road, air, sea and rail. These functions are primarily the responsibility of people who are employed by federal, state and local transportation agencies.

Warehousing and Distribution Center Operations Pathway: The operation of transportation and distribution facilities including ports, terminals, warehouses, and other types of facilities is the focus of this pathway. All cargo needs to be tracked, sorted, labeled, and loaded accurately and safely.