






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.

Sample Career Specialties / Occupations	<p>Agricultural Sales • Agricultural Communications Specialists • Business-Educators • Food Scientists • Meat Processors-Toxicologists • Biochemists-Nutritionists-Dieticians • Food Brokers-Food Inspectors • Meat Cutters-Meat Graders • Meat Science Researchers • Food Meal Supervisors • Cheese Makers • Microbiologists • Produce Buyers • Bacteriologists • Food & Drug Inspectors • Bioengineers • Biochemists • Food & Fiber Engineers • Food Processors • Storage Supervisors • Fieldman • Quality Control Specialists</p>	<p>Bioinformatics Specialists • Plant Breeders and Geneticists • Biotechnology Lab Technician • Soil & Water Specialists • Crop Farm Managers • Agricultural Educators • Plant Pathologists • Aquaculturalists • Sales Representatives • Botanists • Tree Surgeons • Education & Extension Specialists • Agricultural Journalists • Commodity Marketing Specialists • Grain Operations Superintendents • Custom Hay/Silage Operators • Forest Geneticists • Golf Course Superintendents • Greenhouse Managers • Growers • Farmers • Ranchers</p>	<p>Agricultural Educators • Livestock producers • AI Technicians-Aquaculturalists • Animal Caretakers-Poultry Managers • Equine Managers-Veterinarians • Veterinary Assistants-Feedlot Specialists • Animal Scientists • Embryo Technologists • Livestock Buyers • Feed Sales Representatives • Vivarian Technicians • Wildlife Biologists • Livestock Geneticists • Animal Nutritionists • Dairy Producers • Livestock Inspectors • Feed Sales Specialists • Animal Health Salespersons • Meat Science Researcher • Reproductive Physiologists • Embryo Transfer Technicians • Pet Shop Operators • USDA Inspectors</p>	<p>Machine Operators • Electronics Systems Technicians • Agricultural Engineers • Agricultural Extension Engineering Specialists • Heavy Equipment Maintenance Technicians • Recycling Technicians • Waste Water Treatment Plant Operators • Equipment/Parts Managers • Welders • Machinists • Communication Technicians • Agricultural Applications Software Developers/Programmers • Database Administrators • Computer Service Technical Support Technicians • Information Lab Specialists • GPS Technicians • Remote Sensing Specialists</p>	<p>Cartographers • Wildlife Managers • Range Technicians • Ecologists • Park Managers • Environmental Interpreters • Fish and Game Officers Loggers • Forest Technicians • Log Graders • Pulp and Paper Manager Soil Geology Technician • Geologists • Mining Engineers Fisheries Technicians • Water Monitoring Technician • Hydrologists • Fish Hatchery Manager Commercial Fishermen • Fishing Vessel Operators • Vessel Crew</p>	<p>Pollution Prevention and Control Managers • Pollution Prevention and Control Technicians • Environmental Sampling and Analysis Scientists/Technicians • Health and Safety Sanitarians • Environmental Compliance Assurance Managers • Hazardous Materials Handlers • Hazardous Materials Technicians / Managers • Water Environment Managers • Water Quality Managers • Waste Water Managers • Toxicologists • Solid Waste Disposers / Recyclers • Solid Waste Technician • Solid Waste Managers • Solid Waste Specialists</p>	<p>Salesperson • Sales Manager • Banker/Loan Officer • Field Representative for Bank, Insurance Company or Government Program • Farm Investment Manager • Agricultural Commodity Broker • Agricultural Economist • Farmer /Rancher/Feedlot Operator • Farm Manager • Livestock Rancher / Breeder • Dairy Herd Supervisor (DHIA) • Agricultural Products Buyer • Animal Health Products Distributor • Livestock Seller • Feed and Supply Store Manager • Produce Commission Agent • Ag Lenders • Agricultural Chemical Dealer • Field Service Representative • Chemical Sales Representative</p>
Pathways	<p>Food Products and Processing Systems (Food Processing and preserving, Packaging, Distribution, Government monitoring & regulation)</p>	<p>Plant Systems (Agronomic, Horticulture, Forestry, Turf, Viticulture, Soils, etc.)</p>	<p>Animal Systems (Large animals, small animals, wildlife animals, and research animals)</p>	<p>Power, Structural & Technical Systems (Power, Structures, Controls, Geospatial Technology, Computer Systems, Electronics, Hydraulics, Pneumatics, etc.)</p>	<p>Natural Resources Systems (Habitat Conservation, Forest Products, Parks and Recreation, Mining, Environmental Services, Fisheries, Soil Conservation, etc.)</p>	<p>Environmental Service Systems (Pollution Prevention, Water & Air Quality, Hazardous Materials, Solid Waste Management, Health & Safety Sanitation, etc.)</p>	<p>Agribusiness Systems (Sales, Service, Farm and Ranch Management, Entrepreneurship, Economics, etc.)</p>
Cluster K&S	<p align="center">Cluster knowledge and skills</p> <p align="center">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology ◆ Systems ◆ Safety, Health and Environment ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills</p>						





Careers in designing, planning, managing, building and maintaining the built environment.

Sample Career Specialties / Occupations	<p>Architect • Architectural and Civil Drafter • Drafter • Regional and Urban Planner/Designer • Industrial Engineer • Materials Engineer • Mechanical Drafter • Environmental Designer • Civil Engineer (structural, geotechnical, transportation, etc.) • Programmer • Mechanical Engineer (HVAC, plumbing, fire protection, etc.) • Electrical Engineer (electronics, security, telecommunications) • Preservationist • Environmental Engineer (hydro engineering, acoustical, etc.) • Landscape Architect • Surveyor • Fire Prevention and Protection Engineer • Cost Estimator • Electrical and Electronic Engineering Technician • Civil Engineering Technician • Environmental Engineering Technician • Surveying and Mapping Technician • Interior Designer • Landscape Designer • Specifications Writer • Building Code Official • Computer Aided Drafter (CAD) • Renderer (traditional and computer) • Modeler (traditional and computer)</p>	<p>General Contractor/Builder • Specialty Contractor • Construction Engineer • Construction Manager • Superintendent • Project Manager • Construction Foreman • Estimator • Project Inspector • Manufacturer's Representative • Sales and Marketing Manager • Equipment and Material Manager • Scheduler • Education and Training Director/Coordinator • Safety Director • Construction Inspector • Subcontractor • Preservationist • Service Contractor • Field Supervisor • Specialty Trades Subcontractor • Mason • Construction Craft Laborer • Iron/Metalworker (structural and reinforcing) • Carpenter • System Installer • Electrician • Boilermaker • Electronic Systems Technician • Sheetmetal Worker • Security and Fire Alarm Systems Installer • Concrete Finisher • Glazier • Tile and Marble Setter • Landscaper/Groundskeeper • Elevator Installer • Roofer • Painter • Explosives Worker • Plasterer/Drywall • Paperhanger • Insulation Worker • Drywall Installer • Plumber • Pipe Fitter • Millwright • Heating, Ventilation, Air Conditioning and Refrigeration Mechanic • Carpet Installer • Electrician • Steamfitter • Terrazo Worker and Finisher</p>	<p>General Maintenance Contractor • Specialty Contractor • Construction Engineer • Construction Manager • Superintendent • Project Manager • Construction Foreman • Estimator • Facilities Engineer • Reliability Engineer • Environmental Engineer • Demolition Engineer • Project Inspector • Operating Engineer • Manufacturer's Representative • Sales and Marketing Manager • Equipment and Material Manager • Scheduler • Maintenance Planner/Scheduler • Maintenance Estimator • Security Controls Manager • Preservationist • Remodeler • Safety Director • Construction Inspector • Subcontractor • Service Contractor • Field Supervisor • Specialty Trades Subcontractor • Mason • Iron/Metalworker (structural and reinforcing) • Carpenter • System Installer • Electrician • Boilermaker • Cost Estimator • Sheetmetal Worker • Security and Fire Alarm System Installer • Concrete Finisher • Glazier • Tile and Marble Setter • Hazardous Materials Remover • Landscaper/Groundskeeper • Elevator Installer • Paperhanger • Insulation Worker • Drywall Installer • Insulation Worker • Plumber • Pipe Fitter • Millwright • Heating, Ventilation, Air Conditioning and Refrigeration Mechanic • Carpet Installer • Electrician • Steamfitter • Terrazo Worker and Finisher • Refractory Technician • Hydro Testing Technician • Thermal Control Technician • Restoration Technician • Wastewater Maintenance Technician • Highway Maintenance Worker</p>
Pathways	<p>Design/Pre-Construction</p> 	<p>Construction</p> 	<p>Maintenance/Operations</p> 
Cluster K&S	<p>Cluster Knowledge and Skills</p> <ul style="list-style-type: none"> ◆ Academics ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 		



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

Sample Career Specialties/Occupations	<ul style="list-style-type: none"> ◆ Video Systems Technicians ◆ Video Graphics, Special Effects, and Animation ◆ Audio-Video Designers and Engineers ◆ Technical Computer Support Technicians, State, Film, Video, and DVD ◆ Audio-Video System Service Technicians ◆ Audio Systems Technicians 	<ul style="list-style-type: none"> ◆ Graphics and Printing Equipment Operators ◆ Lithographers and Platemakers ◆ Computer Typography and Composition Equipment Operators ◆ Desktop Publishing Specialists; Web Page Designers 	<ul style="list-style-type: none"> ◆ Commercial Photographers, Digital, Still, Video, Film ◆ Interior Designers, Commercial/Residential and Home Furnishings coordinators ◆ Graphic Designers, CAD Technicians, and Fashion Illustrators ◆ Textile Designers ◆ Commercial Artists, Illustrators, and Artists, all Media ◆ Curators and Gallery Managers ◆ Fashion Designers 	<ul style="list-style-type: none"> ◆ Production Managers, Digital, Video, Stage ◆ Cinematographers, Film/Video Editors ◆ Dancers ◆ Play Writers, Screen Writers, Screen Editors, Script Writers ◆ Directors and Coaches, Performers, actors, Musicians ◆ Make-Up Artists and Costume Designers ◆ Stagecraft Designers, Lighters, Sets, Sound Effects, Acoustics, Painters ◆ Composers, Conductors, and Music Instructors 	<ul style="list-style-type: none"> ◆ Audio/Video Operations, Control Room Technician ◆ Station Managers and Radio & TV Announcers ◆ Publishers, Editors, and Journalists and Reporters, Print, Broadcast, Other ◆ Broadcast Technicians 	<ul style="list-style-type: none"> ◆ Telecommunication Technicians ◆ Telecommunication Equipment, Cable, Line Repairers/Installers ◆ Telecommunication Computer Programmers, and Systems Analysts
Pathways	Audio and Video Technology and Film	Printing Technology	Visual Arts	Performing Arts	Journalism and Broadcasting	Telecommunications
Occ. Area	<p>Occupational Area Knowledge and Skills</p> <ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 					



Business Management and Administration careers encompass planning, organizing, directing and evaluating business functions essential to efficient and productive business operations. Business Management and Administration career opportunities are available in every sector of the economy.

Sample Career Specialties / Occupations	<p>Entrepreneurs•Chief Executives•General Managers•Accounting Manager•Accounts Payable Manager•Assistant Credit Manager•Billing Manager•Business & Development Manager•Compensation & Benefits Manager•Credit & Collections Manager•Payroll Manager•Risk Manager•Operations Managers• Public Relations Managers• Human Resource Managers• Management Analysts• Facilities Managers• Association Managers •Meeting & Convention Planners• Administrative Services Managers• Sports & Entertainment Managers•Hospital Management•Government Management•Public Organization Management•Manufacturing Management•Purchasing Management• First Line Supervisors•Public Relations Specialists•Senior Managers•Management Trainees•</p>	<p>Accountants*Accounting Clerk*Accounting Supervisor*Adjuster*Adjustment Clerk*Assistant Treasurer*Auditor*Bookkeeper*Budget Analyst*Budget Manager*Billing Supervisor*Cash Manager*Controller*Merg er & Acquisitions Manager*Price Analyst*Top Collections Executive*Top Investment Executive*Treasurer*Chief Financial Officer*Finance Director*Certified Public Accountant*Accounts Receivable Clerk*Cost Accountant*Financial Accountant*Billing Clerk*Payroll Accounting Clerk</p>	<p>Human Resources Managers•International Human Resources Managers•Human Resources Coordinators•Industrial Relations Director•Compensation & Benefits Managers•Employment & Placement Managers•Employee Assistance Plan Managers•Training & Development Managers•Human Resources consultant•Corporate Trainer• Training & Development Specialists•Conciliators/Mediators/Arbitrators• Employer Relations Representatives•Labor & Personnel Relations Specialists•Affirmative Action Coordinators•Equal Employment Opportunity Specialists•OSHA/ADA Compliance Officer•Pay Equity Officers•Interpreters & Translators•Organizational Behaviorists•Occupational Analysts•Compensation, Benefits & Job Analyst Specialists•Human Resources Information Systems Specialists•Meeting & Convention Planners•Employment Interviewers, Private or Public Employment Service•Personnel Recruiters•Human Resources Assistants•Payroll Professional•Assignment Clerks•Identification Clerks•Human Resources Generalist•Human Resources Clerks</p>	<p>Systems Analyst•E-Commerce Analyst• Requirements Specialist•Marketing Analyst•Operations Research Analyst•Business Consultant•Business Analyst•Budget Analyst• Product Manager•Price Analyst</p>	<p>Marketing Manager•Assistant Marketing Manager•Sales Engineer•Sales Manager•Sales Representative•Broker•Agents•Assistant Store Manager•Department Manager•Assistant Department Manager•Salesperson•Customer Service Supervisor•Customer Service Consultant•Counter Person•Customer Service Clerk•Product Manager•Project Manager•Research & Development Manager•Research & Management Supervisor•International Marketing Manager & Supervisor•International Merchandising Manager & Supervisor•Marketing Manager•Property, Real Estate and Association Manager & Supervisor•Small Business Owner & Entrepreneur•E-commerce Manager & Entrepreneur•Wholesale & Retail buyer•International Distribution Manager•Warehouse Manager•Logistics Manager/Supervisor•Logistics Manager/Coordinator•Market Researcher•Marketing Information Manager•Public Relations Specialist•Public Relations Writer•Copywriter•Media coordinator•Art Director•Graphic Designer•Event Manager•Advertising Salesperson•Route Salesperson•Distribution Worker•Wholesale ,Freight, Stocking, Handling, Material Moving and Packing Worker•Traffic, Shipping, & Receiving Clerk•Demonstrators and Product Promoter•Retail Salespeople & Associate•Telemarketer</p>	<p>Administrative Assistant•Executive Assistant•Office Manager•Administrative Support•Medial Front Office Assistant•Information Assistant•Desktop Publisher•Customer Service Assistant•Data Entry Specialists•Receptionist•Communications Equipment Operator•Computer Operator•Court Reporter•Stenographer•Dispatcher•Shipping & Receiving Personnel•Records Processing Occupations including Library Assistant & Order Processor•Word Processor•Typists•Medical Transcriptionist•Legal Secretaries•Paralegals</p>
Pathways	Management	Business Financial Management & Accounting	Human Resources	Business Analysis	Marketing	Administrative & Information Support
Cluster K&S	<p style="text-align: center;">Cluster knowledge and skills</p> <ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 					





Planning, managing and providing education and training services, and related learning support services.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Sample Career Specialties / Occupations</p>	<ul style="list-style-type: none"> •Superintendents, Principals, Administrators •Supervisors and Instructional Coordinators •Education Researchers, Test Measurement Specialists <ul style="list-style-type: none"> •College Presidents, Deans •Curriculum Developers •Instructional Media Designers 	<ul style="list-style-type: none"> •Psychologists- Clinical, Developmental, Social <ul style="list-style-type: none"> •Social Workers •Parent Educators •Counselors •Speech-Language Pathologists and Audiologists 	<ul style="list-style-type: none"> •Preschool, Kindergarten Teachers, Aids <ul style="list-style-type: none"> •Elementary Teachers, Aids •Secondary Teachers, Aids •Special Education Teachers, Aids •College/University Lecturers, Professors <ul style="list-style-type: none"> Human Resource Trainers Physical Trainers Coaches •Child Care Directors •Child Care Workers •Child Life Specialist <ul style="list-style-type: none"> •Nanny •Early Childhood Teachers and Assistants <ul style="list-style-type: none"> •Teacher Aids •Group Workers and Assistants
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Pathways</p>	<p style="text-align: center;">Administration and Administrative Support</p>	<p style="text-align: center;">Professional Support Services</p>	<p style="text-align: center;">Teaching/Training</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Cluster K&S</p>	<p style="text-align: center;">Cluster knowledge and skills</p> <ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 		





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

Sample Career Specialties / Occupations	Personal Financial Advisor•Tax Preparation• Sales Agents, Securities, Commodities•Investment Advisors•Brokerage Clerk (Assistant)•Development Officers	Accountants• Financial Analysts•Treasurers, Controllers and Chief Revenue Agents•Auditor•Economists•Tax Examiners•Collectors•Revenue Agents	Credit Analyst• Loan Officers•Bill and Account Collectors• Tellers•Loan Processors•Customer Service Reps•Data Processors•Accounting•Internal Auditors•Compliance Officers•Title Researchers & Examiners•Abstractors•Credit Report Providers•Repossession Agents•Network Services•Operations Managers•Debt Counselors	Claims Agents, Examiners, and Investigators• Claims Clerks•Insurance Appraisers•Underwriters• Actuaries•Sales Agents•Customer Service Agents•Processing Clerks•Direct Marketing
Pathways	Financial & Investment Planning	Business Financial Management	Banking & Related Services	Insurance Services
Cluster K&S	<p style="text-align: center;">Cluster knowledge and skills</p> <p style="text-align: center;">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills</p>			





Executing governmental functions to include Governance; National Security; Foreign Service; Planning; Revenue and Taxation; Regulation; and Management and Administration at the local, state, and federal levels.

Sample Career Specialties / Occupations	<p>President Vice President Governor Lieutenant Governor Mayor Cabinet Level Secretary (Fed./ State) Representative (Fed/State) Senator (Fed/State) Assistants, Deputies, and Chiefs of Staff Commissioner (County, Parish, City) Commissioner (State Agency) Congressional Aide Legislative Aide Legislative Assistant Specialist Lobbyist Policy Advisor</p>	<p>National Security Advisor Staff or Field Officer</p> <p>Officer/Specialist: Electronic Warfare Operations Combat Operations Infantry Field Artillery Air Defense Artillery Special Forces Armor Munitions Nuclear Weapons Missile and Space Systems Military Intelligence Signals Intelligence</p> <p>Surface Ship Warfare Officer Submarine Officer Combat Control Officer Combat Engineer Combat Aircraft Pilot/Crew Airborne Warning/Control Specialist Intelligence/Counterintelligence Agent/Specialist Intelligence Analyst Cryptographer</p>	<p>Ambassador Foreign Service Officer: Consular Officer Administrative Officer Political Officer Economic Officer</p> <p>Diplomatic Courier</p>	<p>Business/Enterprise Official Chief of Vital Statistics Commissioner Director (Various Agencies) Economic Development Coordinator Federal Aid Coordinator Census Clerk County Director Census Enumerator Planner Program Associate Global Imaging Systems Specialist</p>	<p>Assessor Tax Auditor Internal Revenue Investigator Revenue Agent/Officer Tax Examiner/Assistant/Clerk Inspector General Tax Attorney Tax Policy Analyst</p>	<p>Business Regulation Investigator Chief of Field Operations Code Inspector/Officer Director Equal-Opportunity Officer Inspector Investigator/Examiner Chief Bank Examiner Bank Examiner Aviation Safety Officer Border Inspector Cargo Inspector Election Supervisor Enforcement Specialist Immigration Officer</p>	<p>City Manager City Council City or County Clerk Court Administrator or Clerk</p> <p>Executive Director/Officer/Associate: Foundation Association Charitable Organization Industrial Foundation Chamber of Commerce</p> <p>General Service Officer Management Analysis Officer Program Administration Officer</p>
Pathways	Governance	National Security	Foreign Service	Planning	Revenue and Taxation	Regulation	Public Management and Administration
Cluster K&S	<p align="center">Cluster knowledge and skills</p> <p align="center">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology ◆ Systems ◆ Safety ◆ Health and Environment ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills ◆ Fiscal Responsibilities</p>						





Preparing individuals for employment in career pathways that relate to families and human needs.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Sample Career Specialties / Occupations</p>	<ul style="list-style-type: none"> • Directors, Childcare Facilities • Assistant Directors, Childcare Facilities • Elementary School Counselors • Preschool Teachers • Educators for Parents • Nannies • Teachers' Assistants • Childcare Assistants/Workers 	<ul style="list-style-type: none"> • Clinical and Counseling Psychologists • Industrial-Organizational Psychologists • Sociologists • School Counselors/Psychologists • Substance Abuse and Behavioral Disorder Counselors • Mental Health Counselors • Vocational Rehabilitation Counselors • Career Counselors • Employment Counselors • Residential Advisors • Marriage, Child and Family Counselors 	<ul style="list-style-type: none"> • Community Service Directors • Adult Day Care Coordinators • Coordinators of Volunteers • Licensed Professional Counselors • Religious Leaders • Directors, Religious Activities/Education Programs • Human Services Workers • Social Services Workers • Vocational Rehabilitation Counselors • Employment Counselors • Career Counselors • Vocational Rehabilitation Service Workers • Leisure Activities Coordinators • Dieticians • Geriatric Service Workers • Adult Day Care Workers • Residential Advisors • Emergency and Relief Workers • Community Food Service Workers • Community Housing Service Workers • Social and Human Services Assistants 	<ul style="list-style-type: none"> • Barbers • Cosmetologists, Hairdressers, & Hairstylists • Shampoos • Nail Technicians, Manicurists & Pedicurists • Skin Care Specialists/Estheticians • Electrolysis Technicians • Electrologists • Funeral Directors/Morticians • Embalmers • Funeral Attendants • Personal and Home Care Aides • Companions • Spa Attendants • Personal Trainers • Massage Therapists 	<ul style="list-style-type: none"> • Consumer Credit Counselors • Consumer Affairs Officers • Consumer Advocates • Certified Financial Planners • Insurance Representatives • Bankers • Real Estate Services Representatives • Financial Advisors • Investment Brokers • Employee Benefits Representatives • Hospital Patient Accounts Representatives • Customer Service Representatives • Consumer Research Department Representatives • Consumer Goods or Services Retailing Representatives • Market Researchers • Account Executives • Sales Consultants • Event Specialists • Inside Sales Representatives • Field Merchandising Representatives • Buyers • Small Business Owners
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Pathways</p>	<p>Early Childhood Development & Services</p>	<p>Counseling & Mental Health Services</p>	<p>Family & Community Services</p>	<p>Personal Care Services</p>	<p>Consumer Services</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Cluster K&S</p>	<p style="text-align: center;">Cluster Knowledge and Skills</p> <p style="text-align: center;">♦ Academic Foundations ♦ Communications ♦ Problem Solving and Critical Thinking ♦ Information Technology Applications ♦ Systems ♦ Safety, Health and Environmental ♦ Leadership and Teamwork ♦ Ethics and Legal Responsibilities ♦ Employability and Career Development ♦ Technical Skills</p>				





Health Science Career Cluster

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

Sample Career Specialties/Occupations	<ul style="list-style-type: none"> ◆ Acupuncturist ◆ Anesthesiologist Assistant ◆ Art / Music / Dance Therapist(s) ◆ Athletic Trainer ◆ Audiologist ◆ Certified Nursing Assistant ◆ Chiropractor ◆ Dental Assistant / Hygienist ◆ Dental Lab Technician ◆ Dentist ◆ Dietician ◆ Dosimetrist ◆ EMT ◆ Exercise Physiologist ◆ Home Health Aide ◆ Kinesiotherapist ◆ Licensed Practical Nurse ◆ Massage Therapist ◆ Medical Assistant ◆ Mortician ◆ Occupational Therapist / Asst ◆ Ophthalmic Medical Personnel ◆ Optometrist ◆ Orthotist/Prosthetist ◆ Paramedic ◆ Pharmacist/Pharmacy Tech ◆ Physical Therapist / Assistant ◆ Physician (MD/DO) ◆ Physician's Assistant ◆ Psychologist ◆ Recreation Therapist ◆ Registered Nurse ◆ Respiratory Therapist ◆ Social Worker ◆ Speech Language Pathologist ◆ Surgical Technician ◆ Veterinarian / Vet Tech 	<ul style="list-style-type: none"> ◆ Cardiovascular Technologist ◆ Clinical Lab Technician ◆ Computer Tomography (CT) Technologist ◆ Cytogenetic Technologist ◆ Cytotechnologists ◆ Diagnostic Medical Sonographers ◆ Electrocardiographic (ECG) Technician ◆ Electronic Diagnostic (EEG) Technologist ◆ Exercise Physiologist ◆ Geneticist ◆ Histotechnician ◆ Histotechnologist ◆ Magnetic Resonance (MR) Technologist ◆ Mammographer ◆ Medical Technologist / Clinical Laboratory Scientist ◆ Nuclear Medicine Technologist ◆ Nutritionist ◆ Pathologist ◆ Pathology Assistant ◆ Phlebotomist ◆ Positron Emission Tomography (PET) Technologist ◆ Radiologic Technologist/Radiographer ◆ Radiologist 	<ul style="list-style-type: none"> ◆ Admitting Clerk ◆ Applied Researcher ◆ Community Services Specialists ◆ Data Analyst ◆ Epidemiologist ◆ Ethicist ◆ Health Educator ◆ Health Information Coder ◆ Health Information Services ◆ Healthcare Administrator ◆ Medical Assistant ◆ Medical Biller/Patient Financial Services ◆ Medical Information Technologist ◆ Medical Librarian/Cybrarian ◆ Patient Advocates ◆ Public Health Educator ◆ Reimbursement Specialist (HFMA) ◆ Risk Management ◆ Social Worker ◆ Transcriptionist ◆ Unit Coordinator ◆ Utilization Manager 	<ul style="list-style-type: none"> ◆ Biomedical / Clinical Engineer ◆ Biomedical / Clinical Technician ◆ Central Services ◆ Environmental Health and Safety ◆ Environmental Services ◆ Facilities Manager ◆ Food Service ◆ Hospital Maintenance Engineer ◆ Industrial Hygienist ◆ Materials Management ◆ Transport Technician 	<ul style="list-style-type: none"> ◆ Biochemist ◆ Bioinformatics Associate ◆ Bioinformatics Scientist ◆ Bioinformatics Specialist ◆ Biomedical Chemist ◆ Biostatistician ◆ Cell Biologist ◆ Clinical Trials Research Associate ◆ Clinical Trials Research Coordinator ◆ Geneticist ◆ Lab Assistant-Genetics ◆ Lab Technician ◆ Microbiologist ◆ Molecular Biologist ◆ Pharmaceutical Scientist ◆ Quality Assurance Technician ◆ Quality Control Technician ◆ Regulatory Affairs Specialist ◆ Research Assistant ◆ Research Associate ◆ Research Scientist ◆ Toxicologist
Pathways	Therapeutic Services	Diagnostics Services	Health Informatics	Support Services	Biotechnology Research and Development
Cluster K & S	<p>Cluster Knowledge and Skills</p> <ul style="list-style-type: none"> ◆ Academic Foundation ◆ Communications ◆ Systems ◆ Employability Skills ◆ Legal Responsibilities ◆ Ethics ◆ Safety Practices ◆ Teamwork ◆ Health Maintenance Practices ◆ Technical Skills ◆ Information Technology Applications 				



Hospitality & Tourism encompasses the management, marketing and operations of restaurants and other foodservices, lodging, attractions, recreation events and travel related services.

Sample Career Specialties/Occupations	<p>General Manager, •Food & Beverage Manager•Kitchen Manager•Catering & Banquets Manager•Service Manager• Maitre'd•</p> <p>Restaurant Owner•Baker•Brewer•Caterer•</p> <p>Executive Chef•Cook•Pastry & Specialty Chef• Bartender•Restaurant Server•Banquet Server•Cocktail Server•Banquet Set-Up Employee•Bus Person•Room Service Attendant•Kitchen Steward•Counter Server•Wine Steward•Host</p>	<p>Front Office Manager•Executive Housekeeper•Director of Sales & Marketing•Chief Engineer•Director of Human Resources•Rooms Division Manager•Director of Security•Controller•Food & Beverage Director•Resident Manager•Director of Operations•General Manager•Regional Manager•Quality Assurance Manager•Corporate Management•Lodging Management•Owner/Franchisee</p> <p>Administrative Support•Uniformed Services Support•Communications Supervisor•Front Desk Supervisor•Reservations Supervisor•Laundry Supervisor•Room Supervisor•Bell Captain•Shift Supervisor•Sales Professional•Night Auditor•</p> <p>Front Desk Employee•Valet Attendant•Bell Attendant•Door Attendant•Concierge•PBX Operator•Reservationist•Guestroom Attendant•Public Space Cleaner•Laundry Attendant•House Person•Maintenance Worker•Van Driver</p>	<p>Executive Director•Assistant Director• Director of Tourism Development•Director of Membership Development•Director of Communications•Director of Visitor Services•Director of Sales•Director of Marketing and Advertising• Director of Volunteer Services•Director of Convention and Visitors Bureau•Market Development Manager•Group Sales Manager•Events Manager• Sales Manager•Destination Manager• Convention Services Manager•Heritage Tourism Developer•Travel Agent (Commercial & Vacation)•Event Planner• Meeting Planner•Special Events Producer•Nature Tourism Coordinator•Tour and Travel Coordinator•Tourism Marketing Specialist•Transportation Specialist• Welcome Center Supervisor•Visitor Center Counselor•Tourism Assistant•Executive Assistant•Tour Guide•Tour Operator• Motor Coach Operator•Tour and Ticket Reservationist• Interpreter</p>	<p>Club Manager•Club Assistant Manager•Club Instructor•Club Equipment & Facility Maintenance •Club Scheduler•Club Event Planner•Club Membership Developer•Parks & Gardens Director•Parks & Gardens Activity Coordinator•Parks & Gardens Access Management•Parks & Gardens Safety & Security•Parks & Garden Ranger•Resort Trainer•Resort Instructor•Resort Equipment Maintenance•Resort Scheduler•Gaming & Casino Manager•Gaming & Casino Supervisor•Gaming & Casino Dealer•Gaming & Casino Slot Supervisor and Maintenance•Gaming & Casino Security & Safety•Fairs/Festival Event Planner•Fairs/Festival Set up Supervisor•Fairs/Festival Facility Manager•Fairs/Festival Promotional Developer•Theme Parks/Amusement Parks Resale Department Manager•Theme Parks/Amusement Parks Area Retail Manager•Theme Parks/Amusement Parks Area Ride Operations Manager•Theme Parks/Amusement Parks Group Events Manager•Family Centers Manager•Family Centers Equipment Operator/Maintenance•Historical /Cultural/Architectural Ecological Industrial Sites Guides/Ranger•Historical/Cultural/Architectural Ecological Industrial Sites Exhibit Developer•Museums/Zoos/Aquariums Docent•Museum/Zoos/Aquariums Animal Trainer and Handler•Museums/Zoos/Aquariums Exhibit Developer</p>
Pathways	Restaurants and Food/Beverage Services	Lodging	Travel & Tourism	Recreation, Amusements & Attractions
Cluster K&S	<p align="center">Cluster knowledge and skills</p> <p align="center">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills</p>			





Building Linkages in IT Occupations Framework: For Entry Level, Technical, and Professional Careers Related to the Design, Development, Support and Management of Hardware, Software, Multimedia, and Systems Integration Services.

Sample of Career Specialties / Occupations	<p>Network Design and Administration:</p> <ul style="list-style-type: none"> ❑ Communications Analyst * Data Communications Analyst * Information Systems Administrator * Information Systems Operator * Information Technology Engineer ❑ Network: Administrator * Analyst * Architect * Engineer * Manager * Operations Analyst * Security Analyst * Specialist * Technician * Transport Administrator ❑ PC Support Specialist * Systems Support Lead * Network Engineer ❑ Systems: Administrator * Engineer * Support Lead ❑ Technical Support Specialist * User Support Specialist ❑ Telecommunications Network Technician 	<p>Database Development and Administration:</p> <ul style="list-style-type: none"> ❑ Data: Administrator * Analyst * Architect * Management Associate * Modeler * Modeling Specialist ❑ Database: Administration Associate * Administrator * Analyst * Developer * Manager * Modeler * Security Expert * DSS (Decision Support Services) * Knowledge Architect ❑ Senior: Database Administrator * Systems Analyst ❑ Systems: Administrator * Analyst ❑ Tester <p>Technical Writer:</p> <ul style="list-style-type: none"> ❑ Desktop Publisher * Document Specialist * Documentation Specialist * Editor ❑ Electronic Publications Specialist * Publisher ❑ Instructional Designer, Online Publisher ❑ Technical Communicator * Editor * Publications Manager * Writer <p>Technical Support:</p> <ul style="list-style-type: none"> ❑ Analyst * Call Center Support Representative * Content Manager ❑ Customer: Liaison * Service Representative * Service Professional ❑ Help Desk: Specialist * Technician ❑ Maintenance Technician * PC Support Specialist * PC Systems Coordinator * Product Support Engineer * Sales Support Technician * Systems Analyst ❑ Technical: Account Manager * Support Engineer * Support Representative ❑ Testing Engineer <p>Enterprise Systems Analysis and Integration:</p> <ul style="list-style-type: none"> ❑ Application Integrator * Business Continuity Analyst * Cross-Enterprise Integrator ❑ Data: Systems Designer * Systems Manager * Warehouse Designer ❑ E-Business Specialist * Electronic Transactions Implementer ❑ Information Systems: Architect * Planner ❑ Systems: Analyst * Architect * Integrator 	<p>Digital Media:</p> <ul style="list-style-type: none"> ❑ 2D/3D Artist * Animator * Audio/Video Engineer * Designer * Media Specialist * Media/Instructional Designer ❑ Multimedia: Author * Authoring Specialist * Developer * Specialist ❑ Producer * Production Assistant * Programmer * Streaming Media Specialist * Virtual Reality Specialist ❑ Web: Designer * Producer * Specialist <p>Web Development and Administration:</p> <ul style="list-style-type: none"> ❑ Web: Administrator * Architect * Designer * Page Developer * Producer * Site Developer * Specialist * Webmaster – Level 1 & 2 (c) ❑ Webmaster 	<p>Programming / Software Engineering:</p> <ul style="list-style-type: none"> ❑ Applications: Analyst * Engineer ❑ Business Analyst * Computer Engineer * Data Modeler ❑ Operating System: Designer/Engineer * Programmer Analyst ❑ Program Manager * Programmer * Programmer/Analyst * Project Lead ❑ Software Applications: Specialist * Architect * Design Engineer * Development Engineer * Engineer * QA Specialist * Tester ❑ Systems: Analyst * Administrator ❑ Test Engineer * Tester
Pathways	Network Systems	Information Support and Services	Interactive Media	Programming and Software Development
Cluster K&S	<p style="text-align: center;">Cluster knowledge and skills</p> <ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 			





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

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Sample Career Specialties / Occupations</p>	<p>Warden• Jail Administrator• Mid-level Manager• Program Coordinator and Counselor• Public Information Officer• Correctional Trainer• Case Manager• Community Corrections Practitioner• Probation/ parole officer• Corrections Educator• Corrections Officer• Detention Deputy• Youth Services Worker• Facility Maintenance Workers• Transport Officer• Food Service Staff• Medical Staff• Dietitian• Support Staff</p>	<p>Emergency Management and Response Coordinator •Emergency Planning Manager•EMT•Fire Fighter•Mgr/Supv. Of Fire Fighters•Forest Fire Fighter• Mgr/Supv. of Forest Fire Fighters•Forest Fire Inspector & Investigator•Hazardous Materials Responder•Dispatcher•Training Officer, Grant Writer and Coordinator•Rescue Workers</p>	<p>Security Director•Corporate/Agency Security Director/VP•Corporate Director of Sales•Security Systems Designer/Consultant•Physical Security Specialist Consultant•Information Systems Security Specialist•Computer Forensics specialist•Private/Corporate Investigator•Loss Prevention/Security Manager (e.g. Store, hotel)•Security Trainer/Educator•Security Sales Representative/Manager• Loss Prevention Specialist•Physical Security Assistant•Security Systems Technician (Install/maintain)•Investigative Assistant (private sector) Security Trainer (Basics)•Security Sales Assistant• Transportation Security Supervisor•Information Security Assistant (Document Control)•Personnel Security Assistant•Executive Protection Officer (Private)• Supervisory Security officer (armed, unarmed)•Certified Security Officer (SPO, POST, Arrest Authority)•Armored Car Guard•Control Center Operator (e.g. ADT) (Monitoring Center)• Uniformed Security Officer (Unarmed -- proprietary and contract)•Security Clerk• Transportation Security Technician•Loss Prevention Assistant•Uniformed Security officer (armed)•Computer Security Specialist•Computer Forensics Examiner•Executive Protection Specialist•Gaming Surveillance Specialist•Information Security specialist•Information Technology Security•Armored Car Guards•Industrial Espionage Security•Life Guard, Ski Patrol, •Physical Property Security•Private Security Specialist</p>	<p>Animal Control Officer• Bailiffs•Child Support•Missing Persons•Unemployment Fraud Investigators•Criminal Investigators & Special Agents•Gaming Investigator•Bomb Technician•Game Enforcement Officer•Highway Patrol Pilots•Immigration & Customs Inspectors•Mgr/Supv. Police & Detectives•Police Detectives and Criminal Investigators•Police, Fire & Ambulance Dispatchers•Police & Patrol Officers•Private Detectives & Investigators•Sheriffs & Deputy Sheriffs•Training Officer•Transit & Railroad Police•Park Ranger•Evidence Technician•Federal Marshall</p>	<p>Administrative Law Attorney Case Management Specialist Court Reporter File and Document Manager Information Officer Investigator Judge Law Clerk Legal Assistant Legal Secretary Magistrate Mediator/Arbitrator Negotiator Para legal</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Pathways</p>	<p style="text-align: center;">Correction Services</p>	<p style="text-align: center;">Emergency and Fire Management Services</p>	<p style="text-align: center;">Security & Protective Services</p>	<p style="text-align: center;">Law Enforcement Services</p>	<p style="text-align: center;">Legal Services</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Cluster K&S</p>	<p style="text-align: center;">Cluster knowledge and skills</p> <p style="text-align: center;">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills</p>				





Manufacturing Cluster

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.

Sample Career Specialties/Occupations	<ul style="list-style-type: none"> ◆ Assemblers ◆ Automated Manufacturing Technicians ◆ Bookbinders ◆ Calibration Technicians ◆ Electrical Installers and Repairers ◆ Electromechanical Equipment Assemblers ◆ Extruding and Drawing Machine Setters/Set-Up Operators ◆ Extrusion Machine Operators ◆ Foundry Workers ◆ Grinding, Lapping, and Buffing Machine Operators ◆ Hand Packers and Packagers ◆ Hoist and Winch Operators ◆ Instrument Makers ◆ Large Printing Press Machine Setters and Set-Up Operators ◆ Machine Operators ◆ Managers, Supervisors ◆ Medical Appliance Makers ◆ Milling Machine Setters, Set-Up Operators ◆ Millwrights ◆ Operators, Tenders, Cutters/Brazers, Soldering, Machine Operations ◆ Painters ◆ Pattern & Model Makers ◆ Precision Layout Workers ◆ Precision Optical Goods Workers ◆ Production Associates ◆ Sheet Metal Workers ◆ Solderers and Braziers ◆ Tool and Die Makers ◆ Welders 	<ul style="list-style-type: none"> ◆ Design Engineers ◆ Electrical and Electronic Technicians and Technologists ◆ Electronics Engineers ◆ Engineering and Related Technicians and Technologists ◆ Engineering Technicians ◆ Industrial Engineers ◆ Labor Relations Managers ◆ Manufacturing Engineers ◆ Manufacturing Technicians ◆ Power Generating and Reactor Plant Operators ◆ Precision Inspectors, Testers, and Graders ◆ Process Improvement Technicians ◆ Production Managers ◆ Purchasing Agents ◆ Supervisors 	<ul style="list-style-type: none"> ◆ Biomedical Equipment Technicians ◆ Boilermakers ◆ Communication System Installers/Repairers ◆ Computer Installers/Repairers ◆ Computer Maintenance Technicians ◆ Electrical Equipment Installers/Repairers ◆ Facility Electricians ◆ Industrial Electronic Installers/Repairers ◆ Industrial Facilities Managers ◆ Industrial Machinery Mechanics ◆ Industrial Maintenance Electricians ◆ Industrial Maintenance Mechanics ◆ Industrial Maintenance Technicians ◆ Instrument Calibration and Repairers ◆ Instrument Control Technicians ◆ Job/Fixture Designers ◆ Laser Systems Technicians ◆ Maintenance Repairers ◆ Major Appliance Repairers ◆ Meter Installers/Repairers ◆ Millwrights ◆ Plumbers, Pipe Fitters and Steam Fitters ◆ Security System Installers/Repairers 	<ul style="list-style-type: none"> ◆ Calibration Technicians ◆ Inspectors ◆ Lab Technicians ◆ Process Control Technicians ◆ Quality Control Technicians ◆ Quality Engineers ◆ SPC Coordinators 	<ul style="list-style-type: none"> ◆ Communications, Transportation and Utilities Managers ◆ Dispatchers ◆ Freight, Stock, and Material Movers ◆ Industrial Truck and Tractor Operators ◆ Logistical Engineers ◆ Logisticians ◆ Material Associates ◆ Material Handlers ◆ Material Movers ◆ Process Improvement Technicians ◆ Quality Control Technicians ◆ Traffic Managers ◆ Traffic, Shipping, and Receiving Clerks 	<ul style="list-style-type: none"> ◆ Environmental Engineers ◆ Environmental Specialists ◆ Health and Safety Representatives ◆ Safety Coordinators ◆ Safety Engineers ◆ Safety Team Leaders ◆ Safety Technicians
Path ways	Production	Manufacturing Production Process Development	Maintenance, Installation & Repair	Quality Assurance	Logistics & Inventory Control	Health, Safety and Environmental Assurance
Cluster K & S	<p>Cluster Knowledge and Skills</p> <ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 					



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

Sample Career Specialties / Occupations	<ul style="list-style-type: none"> • Entrepreneurs • Owners • Small Business Owners • Presidents • Chief Executive Officers • Principals • Partners • Proprietors • Franchisees • Independent X's (e.g., distributor) • Customer Service Representatives • Administrative Support Representatives (e.g., human resources, clerical, finance, technical) 	<ul style="list-style-type: none"> • Inbound Call Managers • Channel Sales Managers • Regional Sales Managers • Client Relationship Managers • Business Development Managers • Territory Representatives / Managers • Key Account Managers • National Account Managers • Account Executives • Sales Engineers • Sales Executives • Technical Sales Specialists • Retail Sales Specialists (big ticket) • Outside Sales Representatives • Industrial Sales Representatives • Manufacturer's Representatives • Salespersons • Field Marketing Representatives • Brokers • Agents • Field Representatives • Solutions Advisors • Sales/Marketing Associates • Telemarketers • Customer Service Representatives • Administrative Support Representatives (e.g., human resources, clerical, finance, technical) 	<ul style="list-style-type: none"> • Store Managers • Retail Marketing Coordinators • Merchandising Managers • Merchandise Buyers • Operations Managers • Visual Merchandise Managers • Sales Managers • Department Managers • Sales Associates • Customer Service Representatives • Clerks (e.g., stock, receiving, etc.) • Administrative Support Representatives (e.g., human resources, clerical, finance, technical) 	<ul style="list-style-type: none"> • Advertising Managers • Public Relations Managers • Public Information Directors • Sales Promotion Managers • Co-op Managers • Trade Show Managers • Circulation Managers • Promotions Managers • Art/Graphics Directors • Creative Directors • Account Executives • Account Supervisors • Sales Representatives • Marketing Associates • Media Buyers/Planners • Interactive Media Specialists • Analysts • Contract Administrators • Copywriters • Research Specialists • Research Assistants • Customer Service Representatives • Administrative Support Representatives (e.g., human resources, clerical, finance, technical) 	<ul style="list-style-type: none"> • Database Managers • Research Specialists / Managers • Brand Managers • Marketing Services Managers • Customer Satisfaction Managers • (Research) Project Managers • CRM Managers • Forecasting Managers • Strategic Planners, Marketing • Product Planners • Planning Analysts • Directors of Market Development • Database Analysts • Analysts • Research Associates • Frequency Marketing Specialists • Knowledge Management Specialists • Interviewers • Customer Service Representatives • Administrative Support Representatives (e.g., human resources, clerical, finance, technical) 	<ul style="list-style-type: none"> • Warehouse Managers • Materials Managers • Traffic Managers • Logistics Managers • Transportation Managers • Inventory Managers / Analysts • Logistics Analysts/Engineers • Distribution Coordinators • Shipping / Receiving Administrators • Shipping / Receiving Clerks • Customer Service Representatives • Administrative Support Representatives (e.g., human resources, clerical, finance, technical) 	<ul style="list-style-type: none"> • Fulfillment Managers • E-Merchandising Managers • E-Commerce Directors • Web Site Project Managers • Internet Project Directors • Brand Managers • Forum Managers • Web Masters • Web Designers • Interactive Media Specialists • Internet Sales Engineers • Site Architects • User Interface Designers • On-line Market Researchers • Copywriters-Designers • Account Supervisors • Customer Support Specialists • Customer Service Representatives • Administrative Support Representatives (e.g., human resources, clerical, finance, technical)
	Path-ways	Management and Entrepreneurship	Professional Sales and Marketing	Buying and Merchandising	Marketing Communications and Promotion	Marketing Information Management and Research	Distribution and Logistics
Cluster K&S	<p align="center">Cluster Knowledge and Skills</p> <p align="center">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems</p> <p align="center">◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities</p> <p align="center">◆ Employability and Career Development ◆ Technical Skills</p>						





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.

Sample Career Specialties / Occupations	<p>Aerospace Engineer* Aeronautical Engineer* Agricultural Engineer* Agricultural Technician* Application Engineer* Architectural Engineer* Automotive Engineer* Biomedical Engineer* Biotechnology Engineer* Chemical Engineer* Civil Engineer* Communications Engineer* Computer Engineer* Computer Hardware Engineer* Computer Programmer* Computer Science Technician* Computer Software Engineer* Construction Engineer* Consultant* Development Engineer* Drafter* Electrical Engineer* Electrician* Electronics Technician* Energy Transmission Engineer* Environmental Engineer* Facilities Technician* Fire Protection Engineer* Geothermal Engineer* Hazardous Waste Engineer* Hazardous Waste Technician* Human Factors Engineer * Industrial Engineer* Industrial Engineering Technician* Licensing Engineer* Manufacturing Engineer* Manufacturing Technician* Manufacturing Processes Engineer* Marine Engineer* Materials Engineer* Materials Lab & Supply Technician* Mechanical Engineer* Metallurgic Engineer* Mining Engineer* Naval Engineer* Network Technician* Nuclear Engineer* Ocean Engineer* Operations Research Engineer* Packaging Engineer* Packaging Technician* Petroleum Engineer* Pharmaceutical Engineer* Plastics Engineer* Power Systems Engineer* Product Design Engineer* Project Engineer* Project manager* Prototype Engineer* Quality Engineer* Quality Technician* Radio/TV Broadcast Technician* Radiology Engineer* Researcher* Safety Engineer* Software Engineer* Sound Technician* Structural Engineer* Survey Technician* Systems Design Engineer* Technical Sales Manager* Technical Writer* Telecommunications Engineer* Textile Engineer* Transportation Engineer*</p>	<p>Analytical Chemist* Anthropologist* Applied mathematician* Archeologist* Astronomer* Astrophysicist* Atmospheric scientist* Biologist* Botanist* CAD operator* Cartographer* Chemist* Communications technologist* Conservation scientist* Cosmologist* Cryptographer* Crystallographer* Demographer* Dye chemist* Ecologist* Economist* Electronmicroscopist * Environmental scientist* Expert systems scientist* Geneticist* Geologist* Geophysicist* Geoscientist* Herpetologist* Hydrologist* Ichthyologist* Inorganic chemist* Laboratory Technician * Mammalogist* Marine scientist* Materials analyst* Materials scientist* Mathematician * Mathematics* Metallurgist* Meteorologist* Microbial Physiologist* Mycologist* Nanobiologist* Nuclear chemists* Nuclear technician* Numerical analyst* Nutritionist* Oceanographer* Organic chemist* Ornithologist* Paleontologist* Physicist* Polymer scientist* Programmer* Protein scientist* Protozoologist* Quality-control scientist* Radio chemist* Research chemist* Research Technician* Science Teacher * Lab Technician* Scientific visualization / graphics expert* Spectroscopist* Statistician* Technical writer* Technologist* Toxicologist* Zoologist*</p>
Pathways	<p>Engineering and Technology</p>	<p>Science and Math</p>
Cluster K&S	<p>Cluster knowledge and skills</p> <ul style="list-style-type: none"> ◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environment ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills 	





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

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Sample of Career Specialties / Occupations</p>	<p>Air/Space Transportation: Transportation managers—air * Airplane pilots/copilots * Commercial pilots * Flight engineers * Flight attendants * Dispatchers-air * Traffic managers * Air traffic controllers * Aircraft cargo handling supervisors * Airfield operations specialists * Other airlines operations and support jobs</p> <p>Rail Transportation: Transportation managers—rail * Dispatchers-rail * Traffic managers * Locomotive engineers, * Locomotive firers * Railyard conductors and yardmasters * Railroad brake, signal and switch operators (including train crew members and yard workers) * Railyard engineers, dinky operators, and hostlers * Other railyard and terminal operations and support jobs</p> <p>Water Transportation: Transportation managers—water * Dispatchers—water * Traffic managers * Captains * Mates * Pilots of water vessels * Sailors and marine oilers * Able seamen * Ordinary seamen * Ship and boat captains * Ship engineers * Motorboat operators * Bridge and lock tenders * Other port/harbor/waterway/marina operations and support jobs</p> <p>Road Transportation Transportation managers—road * Dispatchers--Truck/bus/taxi, traffic managers * Truck drivers-heavy * Truck drivers-tractor-trailer * Truck drivers—light or delivery services * Bus drivers-transit and intercity * Bus drivers-school * Taxi drivers and chauffeurs * Truck/bus/taxi terminal operations and support jobs</p> <p>Transit Systems: Transportation managers—mass transit * Dispatchers-bus * Traffic managers * Dispatchers-rail * Traffic managers * Bus drivers—transit and intercity * Subway and streetcar operators * Other terminal operations and support jobs</p>	<p>Logisticians * Logistics managers * Logistics Engineers * Logistics analysts * Logistics consultants * International logistics</p>	<p>Warehouse managers * Storage and distribution managers * Industrial and packaging engineers * Traffic, shipping and receiving clerks * Production, planning, expediting clerks * First-line supervisors/managers of helpers * Laborers, and material movers-hand * First-line supervisors/managers of transportation and material-moving machine and vehicle operators * Laborers and freight, stock and material movers, hand * Car, truck and ship loaders * Packers and packagers-hand * Other packaging/packing/material handling and moving jobs</p>	<p>Facility: Facility maintenance managers and engineers * Industrial equipment mechanics * Industrial electricians, * Electrical/electronic technicians * Other facility/terminal maintenance jobs</p> <p>Mobile Equipment: <u>General</u>—Mobile equipment maintenance managers * Electrical and electronic installers and repairers—transportation equipment * Mobile heavy equipment mechanics <u>Air/Space</u>—Aerospace engineering and operations technicians * Aircraft mechanics and service technicians * Airframe mechanics * Power plant mechanics * Aircraft engine specialists * Aircraft body and bonded structure repairers * Avionics technicians. <u>Water</u>—Motorboat mechanics * Ship mechanics and repairers * Motorboat mechanics * Automotive/truck mechanics and body repairers <u>Rail</u>—Rail car repairers * Signal and track switch repairers * Rail locomotive and car mechanics and repairers <u>Road</u>—Electronic equipment installers and repairers—motor vehicle * Automotive body and related repairers * Automotive glass installers and repairers * Automotive service technicians and mechanics * Automotive master mechanics * Automotive specialty technicians * Bus and truck mechanics and diesel engine specialists * Motorcycle mechanics * Bicycle repairers * Tire repairers and changers</p>	<p><u>General</u>—<u>Intermodal</u>—Urban and regional planners * Civil engineers * Engineering technicians * Surveying and mapping technicians * Government service executives * Environmental compliance inspectors <u>Air/Space</u>—Air traffic controllers * Aviation inspectors <u>Road</u>—Traffic engineers * Traffic technicians * Motor vehicle inspectors * Freight inspectors, <u>Rail</u>—Railroad inspectors <u>Water</u>—Marine cargo inspectors * Vessel traffic control specialists <u>Transit</u>—Public transportation inspectors <u>Other</u>—Other government agency managers * Regulators * Inspectors, other federal/state/local transportation agency jobs</p>	<p>Health and safety managers * Industrial health and safety engineers * Environmental scientists and specialists * Environmental protection technicians * Environmental managers and engineers * Environmental compliance inspectors * Safety analysts</p>	<p>Marketing managers, * Sales managers * Sales representatives—transportation/logistics services * Reservation, travel and transportation agents/clerks * Cargo and freight agents * Customer service managers, * Customer service representatives * Customer order and billing clerks * Cashiers, counter and rental clerks</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Pathways</p>	<p style="text-align: center;">Transportation Operations</p>	<p style="text-align: center;">Logistics Planning and Management Services</p>	<p style="text-align: center;">Warehousing and Distribution Center Operations</p>	<p style="text-align: center;">Facility and Mobile Equipment Maintenance</p>	<p style="text-align: center;">Transportation Systems/ Infrastructure Planning, Management, and Regulation</p>	<p style="text-align: center;">Health, Safety and Environmental Management</p>	<p style="text-align: center;">Sales and Service</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Cluster K&S</p>	<p style="text-align: center;">Cluster knowledge and skills</p> <p style="text-align: center;">◆ Academic Foundations ◆ Communications ◆ Problem Solving and Critical Thinking ◆ Information Technology Applications ◆ Systems ◆ Safety, Health and Environmental ◆ Leadership and Teamwork ◆ Ethics and Legal Responsibilities ◆ Employability and Career Development ◆ Technical Skills</p>						