

NORTH CAROLINA Career Clusters Guide



2018

*16 Career Clusters, Career Pathways, and
Tools to Help you Discover your Interests*

This guide was produced by the Labor & Economic Analysis Division (LEAD) of the NC Department of Commerce.

Access an interactive online version of this guide at nccareers.org/careerguide

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Career Clusters and Pathways Source: [National Career Clusters® Framework](https://www.onetonline.org/find/career?c=0&g=Go) implemented by Department of Defense ASVAB Career Exploration Program (updated 2016). Downloaded from [onetonline.org/find/career?c=0&g=Go](https://www.onetonline.org/find/career?c=0&g=Go).



**STATE OF NORTH CAROLINA
OFFICE OF THE GOVERNOR**

ROY COOPER
GOVERNOR

February 27, 2018

Dear Friends:

Welcome to the 2018 edition of the North Carolina Career Clusters Guide. Whether you are a student, a graduate, someone considering a career change, or a career counselor, this guide can help with career planning.

One of my top priorities as Governor is getting our state's workforce ready for the jobs of today and tomorrow. Eighty-five percent of the jobs that will exist in 2030 haven't even been invented yet. It's critical that everyone get the skills they need to be job ready now and in the future.

Having information about career options and the education needed to prepare for those careers is an important first step to becoming job ready. You can use this guide to explore what jobs match your interests through the career interest profiler, learn about the most in-demand careers in our state, and find opportunities to try out a career through work-based learning.

I want North Carolinians to be better educated, healthier, and have more money in their pockets so that they can live more abundant, purposeful lives. The linchpin to achieving that goal is helping people get good-paying jobs to support themselves and their families. And the linchpin to getting a good-paying job is having the right education and training.

I encourage you to use this tool and others to explore your career options and to pursue the education and training you need to succeed.

Very truly yours,

A handwritten signature in black ink that reads "Roy Cooper".

Roy Cooper



Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Dear Career Planner,

Never before has it been more important to understand your career options and opportunities and just as importantly the necessary preparation. With the ongoing changes in required skills for today's and tomorrow's jobs, all our workforce partners want to ensure individuals have both timely and accurate information that supports informed decisions about career paths.

With that in mind, we are pleased to provide you with the 2018 edition of the North Carolina Career Clusters Guide. The Guide is a valuable resource for individuals developing education and occupational plans. It is designed around career clusters and related pathways, portraying a common set of knowledge and skills required for career success in each path. Connecting career interests with instructional pathways and ultimately specific occupations allows career seekers to develop a targeted strategy for success.

Today's North Carolina workforce is ever-changing. Students using the Career Clusters Guide will be able to make career decisions that meet the needs of our state's current and emerging economy. This talent pipeline decision-making is key to supporting our state's workforce system.

Sincerely,

Lisa M. Chapman
*Senior Vice President and Chief Academic Officer
North Carolina Community Colleges*

Mark Johnson
*State Superintendent
NC Department of Public Instruction*

In compliance with Federal Law, the North Carolina Community Colleges administer all state operated educational programs, employment activities and admissions, without discrimination because of race, religion, national or ethnic origin, color, age, military service, disability or gender except where exemption is appropriate and allowed by law.

















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How to Use This Guide for Career Planning

Are you planning for high school, college, the workforce, or a career change? You will find the North Carolina Career Clusters Guide a valuable resource as you make these important decisions. This guide is designed to be a tool for planning and preparing for a career. It gives you a structure for selecting careers by linking what you know about yourself with information about occupations and typical training requirements.

The career-planning process is the cycle you follow when deciding which occupations match your interests and other personal characteristics. You can repeat this process as needed to help you find your place in the world of work.

Follow these steps to learn about career clusters, their multiple pathways, and to find career options that best fit you.

1

Know Yourself

The Interest Profiler on pages 7-10 gives you one option for finding career clusters and occupations that match your interests and preferred activities. Results do not tell you which occupation or cluster you should choose, but they do provide information for determining the kinds of work you might want to explore.

2

Explore Career Clusters

Career Clusters help you sort through more than 900 careers. Each cluster contains occupations that have similar knowledge and skills. Career Pathways within each cluster identify useful training to prepare for work in specific jobs. Connect your Interest Profiler results with clusters and occupations on pages 14-15 to discover which ones most closely match your work-related interests.

3

Know Your Options

Use your Step 2 information to choose one Career Cluster from the section starting on page 16. First, get the cluster's "big picture" and find online career resources. Then learn about the cluster, its pathways, and related occupations. Review the Selected Careers table's job descriptions, employment growth, salary data, and interests. Find out about successful people who work in the cluster. Repeat this process with other clusters that interest you.

4

Prepare for Work

Take an active role in building upon your career exploration. Starting on page 113, discover ways to "try out" careers, find educational options, and explore the job market.

Discover Where Your Interests & Career Clusters Intersect

The Interest Profiler¹ is a self-assessment tool designed to help you identify what your interests are and translate these interests into occupations that best fit you. The following two pages include a list of 60 questions about work activities that some people perform in their jobs. By answering questions that represent important Interest Areas, the results from the Interest Profiler will help you discover your strong work-related interests and match them to careers.

Instructions for taking the Interest Profiler

- Read the work activities from top to bottom and answer in the correct order.
- Read each question carefully and decide how you would feel about doing each type of work. Try not to think about whether you have enough education or training to do the work, or how much money you would make doing the work. Just think about whether you would like or dislike performing the work activity.
- Mark the "Like," "Dislike," or "Unsure" box based on how much you would enjoy that activity.



Other ways to explore your own characteristics:

Interests are only one part of who you are, so check out the following sites to find other ways to explore your own characteristics and identify other qualities that connect with careers that you may choose.

Interests:

Career Key
careerkey.org

Campbell Interest & Skill Survey
pearsonclinical.com/talent/products/100000323/campbell-interest-and-skill-survey-ciss.html#tab-details

Self-Directed Search
self-directed-search.com

Personality Type:

Myers-Briggs Type Indicator
cpp.com/en-US/Products-and-Services/Myers-Briggs

Abilities & Aptitudes:

SAT
collegereadiness.collegeboard.org/sat

ACT
act.org/content/act/en/products-and-services/the-act.html

ASVAB
official-asvab.com

WorkKeys®
act.org/content/act/en/products-and-services/workkeys-for-job-seekers.html

¹ The Interest Profiler is adapted from the O*NET® Interest Profiler Short Form, a shorter web-based version of the O*NET Interest Profiler. Both interest assessment instruments are part of the Career Exploration Tools owned by the U.S. Department of Labor, Employment Training Administration (DOL/ETA). The O*NET Interest Profiler Short Form was developed to aid in career exploration settings where it is beneficial for interest assessments to be completed and discussed in a short amount of time (e.g., career counseling and consultation settings). For more information about the web-based O*NET Interest Profiler Short Form, please check out onetcenter.org/IP.html or visit MY NEXT MOVE mynextmove.org/explore/ip to take the web-based assessment. All O*NET Assessment/Counseling Tools are copyrighted. O*NET is a trademark of DOL/ETA.

Interest Profiler

Instructions on previous page

| Work Activity | Like | Dislike | Unsure |
|--|------|---------|--------|
| Build kitchen cabinets | | | |
| Lay brick or tile | | | |
| Develop a new medicine | | | |
| Study ways to reduce water pollution | | | |
| Write books or plays | | | |
| Play a musical instrument | | | |
| Teach an individual an exercise routine | | | |
| Help people with personal or emotional problems | | | |
| Buy and sell stocks and bonds | | | |
| Manage a retail store | | | |
| Develop a spreadsheet using computer software | | | |
| Proofread records or forms | | | |
| Repair household appliances | | | |
| Raise fish in a fish hatchery | | | |
| Conduct chemical experiments | | | |
| Study the movement of planets | | | |
| Compose or arrange music | | | |
| Draw pictures | | | |
| Give career guidance to people | | | |
| Perform rehabilitation therapy | | | |
| Operate a beauty salon or barber shop | | | |
| Manage a department within a large company | | | |
| Load computer software into a large computer network | | | |
| Operate a calculator | | | |
| Assemble electronic parts | | | |
| Drive a truck to deliver packages to offices and homes | | | |
| Examine blood samples using a microscope | | | |
| Investigate the cause of a fire | | | |
| Create special effects for movies | | | |
| Paint sets for plays | | | |

Record total number of likes for each color/pattern:



| Work Activity | Like | Dislike | Unsure |
|---|------|---------|--------|
| Do volunteer work at a non-profit organization | | | |
| Teach children how to play sports | | | |
| Start your own business | | | |
| Negotiate business contracts | | | |
| Keep shipping and receiving records | | | |
| Calculate the wages of employees | | | |
| Test the quality of parts before shipment | | | |
| Repair and install locks | | | |
| Develop a way to better predict the weather | | | |
| Work in a biology lab | | | |
| Write scripts for movies or television shows | | | |
| Perform jazz or tap dance | | | |
| Teach sign language to people with hearing disabilities | | | |
| Help conduct a group therapy session | | | |
| Represent a client in a lawsuit | | | |
| Market a new line of clothing | | | |
| Inventory supplies using a hand-held computer | | | |
| Record rent payments | | | |
| Set up and operate machines to make products | | | |
| Put out forest fires | | | |
| Invent a replacement for sugar | | | |
| Do laboratory tests to identify diseases | | | |
| Sing in a band | | | |
| Edit movies | | | |
| Take care of children at a day-care center | | | |
| Teach a high-school class | | | |
| Sell merchandise at a department store | | | |
| Manage a clothing store | | | |
| Keep inventory records | | | |
| Stamp, sort, and distribute mail for an organization | | | |

Record total number of likes for each color/pattern: 

Scoring Instructions¹

Work activity items are color/pattern coded to help you score and interpret results. There are six color/pattern bands of items to represent six Interest Areas. Items in the same color/pattern band represent a particular Interest Area. To reveal your Interest Areas, follow these instructions:

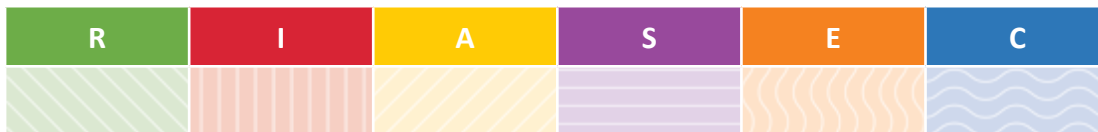
Step 1: Count the number of “Likes” you marked for the questions in green band on page 8, then record the number in the first green box at the bottom of page 8.

Step 2: Count the number of “Likes” you marked for the questions in the green band on page 9, then record the number in the green box at the bottom of page 9.

Step 3: Add the numbers in the two green boxes on pages 8 and 9 and write the total in the “R” green box below. This total equals your score for the Realistic Interest Area.

Step 4: Repeat steps 1, 2, and 3 for the red, yellow, purple, orange, and blue questions.

| Color/ Pattern | Interest Area |
|-------------------|------------------|
| Green | Realistic |
| Red | Investigative |
| Yellow | Artistic |
| Purple | Social |
| Orange | Enterprising |
| Blue | Conventional |



Which Interest Area has your highest score: R, I, A, S, E, or C? Enter the letter below:

First Interest Area: _____

Which Interest Area has your second highest score? Enter the letter below.

Second Interest Area: _____

Which Interest Area has your third highest score? Enter the letter below.

Third Interest Area: _____

What Your Interest Areas Mean

Which occupations match your interests? At the start, you will want to explore occupations that include your First Interest Area. For example, a person with strong Realistic interests would probably be most satisfied with Realistic occupations (e.g., electrician, firefighter, surgical technologist). John Holland, who created the Holland code, suggests that most people will have interests in several of the six interest categories. If you have two Area scores that are the same, consider using them both. Use your Second and Third Interest Areas to explore additional careers.

Read over the definitions of your First, Second, and Third Interest Areas on the following page to get a better understanding of your work-related interests.

¹The O*NET Interest Profiler Short Form is a self-scored interest assessment. For information about scoring the paper-and-pencil version of the O*NET Interest Profiler Short Form, please check out O*NET® Interest Profiler Short Form Psychometric Characteristics: Summary 2010 (onetcntr.org/dl_files/IPSF_Psychometric.pdf).

The Interest Profiler measures interests in each of the six Holland RIASEC areas.² This section provides definitions for each of the six types. Each definition includes examples of activities that individuals with that interest type like to perform, as well as examples of famous people whose field of work matches the interest type.



Realistic – The “Doers”

People with Realistic interests like work activities that include practical, hands-on problems and solutions. They enjoy dealing with plants, animals, and real-world materials like wood, tools, and machinery. They often enjoy outside work. Often people with Realistic interests do not like occupations that mainly involve doing paperwork or working closely with others. Famous realists: TV carpenter Norm Abram, snowboarder Chloe Kim, and celebrity mechanic Jesse James.



Social – The “Helpers”

People with Social interests like work activities that assist others and promote learning and personal development. They prefer to communicate more than to work with objects, machines, or data. They like to teach, give advice, help, or otherwise be of service to people. Famous helpers: educator Booker T. Washington, mental health care reformer Dorothea Dix, TV psychologist Phil McGraw, and civil rights leader Dr. Martin Luther King Jr.



Investigative – The “Thinkers”

People with Investigative interests like work activities that have to do with ideas and thinking more than with physical activity. They prefer to search for facts and figure out problems mentally rather than to persuade or lead people. Prominent investigators: astrophysicist Neil deGrasse Tyson, primatologist Jane Goodall, mathematician/computer scientist Grace Murray Hopper, and theoretical physicist Steven Hawking.



Enterprising – The “Persuaders”

People with Enterprising interests like work activities that have to do with starting up and carrying out projects, especially business ventures. They like persuading and leading people and making decisions. They enjoy taking risks for profit. These people prefer action rather than thought. Prominent persuaders: TV mogul Oprah Winfrey, business magnate Jeff Bezos, and entrepreneur Elon Musk.



Artistic – The “Creators”

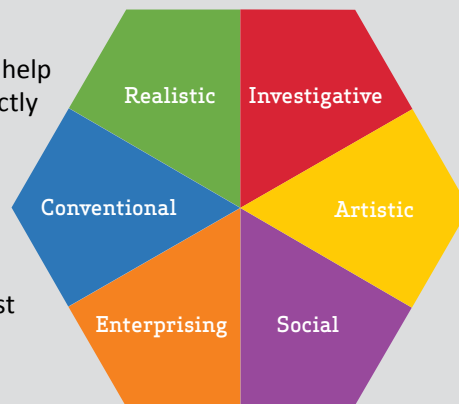
People with Artistic interests like work activities that deal with the artistic side of things, such as forms, designs, and patterns. They like self-expression in their work. They prefer settings where work can be done without following a clear set of rules. Well-known artists: painter/sculptor Leonardo da Vinci, actress Halle Berry, writer J.K. Rowling, and singers Lady Gaga and Tony Bennett.



Conventional – The “Organizers”

People with Conventional interests follow procedures and maintain accurate written and numerical business records. They prefer working in structured settings where roles and tasks are clearly defined. Well-known organizers: businessman J.C. Penney, Supreme Court Justice Sandra Day O'Connor, and professional organizer Alejandra Costello.

John Holland suggested that viewing the Interest Areas on a hexagon can help people understand how their interests overlap or how they may be distinctly different. Interests that are most similar are beside each other on the hexagon (e.g., Social, Enterprising, and Conventional). On the other hand, interests across the hexagon from each other (e.g., Conventional and Artistic) are least likely to have similarities. Sometimes people's combined interests are opposite from or not adjacent to each other. In this case, people sometimes choose to focus on the most different interest as a hobby or to find a unique work setting that merges their interests.



² The O*NET Interest Profiler is compatible with Holland's (1985a) Theory of Vocational Personality, one of the most widely accepted approaches to vocational choice. Information for Interest Areas is extracted from the O*NET Career Exploration Tools owned by the U.S. Department of Labor, Employment Training Administration (DOL/ETA). All O*NET Assessment/Counseling Tools are copyrighted. O*NET is a trademark of DOL/ETA.

16 Career Clusters & Their Career Pathways

Now that you have identified your interests, you have an opportunity to learn about career clusters and how they connect with those interests. Career clusters are groups of occupations in the same field of work that require similar skills. Each cluster contains several smaller groups called career pathways that connect to educational programs, industries, and careers. While a career cluster paints a broad picture of a group of occupations, a pathway helps you focus on and develop a clear, more informed educational plan over time. The structure of the National Career Clusters Framework of 16 career clusters and 73 related career pathways supports your growing career awareness and exploration.

| Career Cluster | Description | Career Pathway |
|--|---|--|
|  <p>Agriculture, Food & Natural Resources</p> | <p>Do you enjoy working with plants and animals? Interested in working to conserve natural resources or protect the environment? This cluster includes careers in the production, processing, distribution, financing, and marketing of agricultural products including food, plants, fiber, animals, wood, and other plant and animal resources.</p> | <ul style="list-style-type: none"> • Agribusiness Systems • Animal Systems • Environmental Service Systems • Food Products & Processing Systems • Natural Resources Systems • Plant Systems • Power, Structural & Technical Systems |
|  <p>Architecture & Construction</p> | <p>Do you want to design, build, and maintain structures where people live, work, and play? This cluster includes careers in designing, planning, managing, building, and maintaining the built environment.</p> | <ul style="list-style-type: none"> • Construction • Design/Pre-Construction • Maintenance/Operations |
|  <p>Arts, Audio/Video Technology & Communications</p> | <p>Do you like to perform? Do you love to use your artistic creativity on the job? This cluster includes careers in designing, producing, exhibiting, performing, writing, and publishing multimedia content, including visual and performing arts and design, journalism, and entertainment services.</p> | <ul style="list-style-type: none"> • Journalism & Broadcasting • Performing Arts • Printing Technology • Telecommunications • Visual Arts |
|  <p>Business Management & Administration</p> | <p>Are you entrepreneurial? Do you like to plan and organize activities? This cluster includes careers in planning, organizing, directing, and evaluating business functions essential to effective and productive business operations.</p> | <ul style="list-style-type: none"> • Administrative Support • Business Information Management • Human Resources Management • General Management • Operations Management |
|  <p>Education & Training</p> | <p>Do you enjoy teaching others? Are you comfortable with public speaking? This cluster includes careers in planning, managing, and providing education and training services and related learning support services, including administration and library services.</p> | <ul style="list-style-type: none"> • Administration & Administrative Support • Professional Support Services • Teaching/Training |
|  <p>Finance</p> | <p>Do you like to work with numbers? Do you want to help people plan for their financial futures? This cluster includes careers in financial and investment planning, banking, insurance, and business financial management.</p> | <ul style="list-style-type: none"> • Accounting • Banking Services • Business Finance • Securities & Investments • Insurance |
|  <p>Government & Public Administration</p> | <p>Are you interested in government and politics? Does the idea of protecting our country appeal to you? This cluster includes careers in planning and providing government services at the federal, state, and local levels, including services related to national security, legislation, foreign service, revenue and taxation, and regulations.</p> | <ul style="list-style-type: none"> • Governance • National Security • Planning • Public Management & Administration • Regulation • Revenue & Taxation |
|  <p>Health Science</p> | <p>Do you enjoy helping people feel better? Would you like working in a hospital or other medical facility? This cluster includes careers in planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnological research and development.</p> | <ul style="list-style-type: none"> • Biotechnology Research & Development • Diagnostic Services • Health Informatics • Support Services • Therapeutic Services |

Introduction to Career Clusters Matrix

Now that you've finished the Interest Profiler, circle the column headings on these two pages that match the First and Second interest areas that you discovered on page 10. Then look at the occupations listed under your types and mark any that appeal to you. Broaden your options by looking across both pages at other occupations in the career clusters containing the jobs you've marked. Remember: the occupations in this matrix give you only a few examples. To find additional careers, explore the career clusters information that follows. **Below are examples of occupations organized by interest type and cluster.**

| | Realistic | Investigative | Artistic |
|--|---|---|--|
| Agriculture, Food & Natural Resources | <ul style="list-style-type: none"> Pest Control Workers Logging Equipment Operators Hazardous Materials Removal Workers | <ul style="list-style-type: none"> Zoologists & Wildlife Biologists Animal Scientists Environmental Engineers | |
| Architecture & Construction | <ul style="list-style-type: none"> Construction Laborers Roofers Sheet Metal Workers | <ul style="list-style-type: none"> Landscape Architects Civil Engineers | <ul style="list-style-type: none"> Interior Designers Architects |
| Arts, Audio/Video Technology & Communications | <ul style="list-style-type: none"> Telecommunications Line Installers Motion Picture Camera Operators Craft Artists | <ul style="list-style-type: none"> Telecommunications Equipment Repairers Film & Video Editors Multimedia Artists & Animators | <ul style="list-style-type: none"> Art Directors Editors Photographers |
| Business Management & Administration | <ul style="list-style-type: none"> Postal Service Mail Carriers Library Assistants, Clerical Office Machine Operators | <ul style="list-style-type: none"> Management Analysts Operations Research Analysts | <ul style="list-style-type: none"> Fundraisers Training & Development Specialists |
| Education & Training | <ul style="list-style-type: none"> Vocational Education Teachers Multimedia Collections Specialists Museum Technicians & Conservators | <ul style="list-style-type: none"> College Economics Teachers Health Specialties Teachers Instructional Coordinators | <ul style="list-style-type: none"> Interpreters & Translators Preschool Teachers College Art, Drama, & Music Teachers |
| Finance | <ul style="list-style-type: none"> Auto Insurance Appraisers | <ul style="list-style-type: none"> Financial Analysts Risk Management Specialists Insurance Underwriters | |
| Government & Public Administration | <ul style="list-style-type: none"> Agricultural Inspectors Transportation Security Screeners Construction & Building Inspectors | <ul style="list-style-type: none"> Statistical Assistants Occupational Health & Safety Specialists | <ul style="list-style-type: none"> Urban & Regional Planners |
| Health Science | <ul style="list-style-type: none"> Veterinary Assistants Medical Equipment Preparers Surgical Technologists | <ul style="list-style-type: none"> Surgeons Podiatrists Pharmacists | <ul style="list-style-type: none"> Recreational Therapists Psychiatrists Speech-Language Pathologists |
| Hospitality & Tourism | <ul style="list-style-type: none"> Dishwashers Bakers Maids & Housekeeping Cleaners | | <ul style="list-style-type: none"> Chefs & Head Cooks Recreation Workers Cooks, Private Household |
| Human Services | <ul style="list-style-type: none"> Tailors Massage Therapists Shampooers | <ul style="list-style-type: none"> Healthcare Social Workers Marriage & Family Therapists Industrial-Organizational Psychologists | <ul style="list-style-type: none"> Cosmetologists Childcare Workers Substance Abuse Counselors |
| Information Technology | <ul style="list-style-type: none"> Computer User Support Specialists Network & Computer Systems Administrators Software Developers, Applications | <ul style="list-style-type: none"> Computer Programmers Software Quality Assurance Engineers & Testers Information Security Analysts | <ul style="list-style-type: none"> Video Game Designers Web Developers |
| Law, Public Safety, Corrections & Security | <ul style="list-style-type: none"> Parking Enforcement Workers Bailiffs Forest Fire Inspectors & Prevention Specialists | <ul style="list-style-type: none"> Forensic Science Technicians Emergency Medical Technicians & Paramedics Fish & Game Wardens | <ul style="list-style-type: none"> Forensic Artists |
| Manufacturing | <ul style="list-style-type: none"> Dental Laboratory Technicians Computer-Controlled Machine Tool Operators Industrial Machinery Mechanics | <ul style="list-style-type: none"> Industrial Engineering Technicians Medical Equipment Repairers Tool & Die Makers | <ul style="list-style-type: none"> Stone Cutters & Carvers Glass Blowers Musical Instrument Repairers & Tuners |
| Marketing | <ul style="list-style-type: none"> Driver/Sales Workers Demonstrators & Product Promoters | <ul style="list-style-type: none"> Market Research Analysts & Marketing Specialists Sales Engineers | <ul style="list-style-type: none"> Public Relations Specialists Models Merchandise Displayers |
| Science, Technology, Engineering & Mathematics | <ul style="list-style-type: none"> Mechanical Engineers Chemical Engineers Electrical Engineers | <ul style="list-style-type: none"> Microbiologists Materials Scientists Chemists | <ul style="list-style-type: none"> Mathematicians Biochemists & Biophysicists Sociologists |
| Transportation, Distribution & Logistics | <ul style="list-style-type: none"> Automotive Body Repairers Bus & Truck Mechanics & Diesel Engine Specialists Commercial Pilots | <ul style="list-style-type: none"> Traffic Technicians Avionics Technicians | |



Source: O*NET OnLine onlinetoolsonline.org/find/career and onlinetoolsonline.org/find/descriptor/browse/interests

| Social | Enterprising | Conventional |
|--|--|---|
| <ul style="list-style-type: none"> Farm Labor Contractors | <ul style="list-style-type: none"> Natural Sciences Managers Farm Product Buyers & Purchasing Agents Agricultural Engineers | <ul style="list-style-type: none"> Environmental Science & Protection Technicians Farm Equipment Mechanics Pesticide Handlers, Sprayers, & Applicators |
| | <ul style="list-style-type: none"> Construction Managers Cost Estimators Supervisors of Landscaping Workers | <ul style="list-style-type: none"> Crane & Tower Operators Highway Maintenance Workers Electricians |
| <ul style="list-style-type: none"> Broadcast News Analysts Choreographers Public Address System & Other Announcers | <ul style="list-style-type: none"> Agents of Artists, Performers & Athletes Musicians & Singers Commercial & Industrial Designers | <ul style="list-style-type: none"> Broadcast Technicians Technical Writers Telecommunications Equipment Installers |
| <ul style="list-style-type: none"> Customer Service Representatives Human Resources Specialists Training & Development Managers | <ul style="list-style-type: none"> Industrial Production Managers Computer & Information Systems Managers Chief Executives | <ul style="list-style-type: none"> Auditors Compensation, Benefits, & Job Analysis Specialists New Accounts Clerks |
| <ul style="list-style-type: none"> Special Education Teachers College Recreation & Fitness Studies Teachers School Counselors | <ul style="list-style-type: none"> Preschool Education Administrators Curators College Business Teachers | <ul style="list-style-type: none"> Librarians Teacher Assistants College Education Administrators |
| <ul style="list-style-type: none"> Insurance Sales Agents Personal Financial Advisors Postmasters & Mail Superintendents | <ul style="list-style-type: none"> Loan Interviewers & Clerks Brokerage Clerks Credit Analysts | <ul style="list-style-type: none"> Bill & Account Collectors Loan Officers Tellers |
| <ul style="list-style-type: none"> Emergency Management Directors Eligibility Interviewers Legislators | <ul style="list-style-type: none"> Equal Opportunity Representatives & Officers Tax Examiners & Collectors Financial Examiners | <ul style="list-style-type: none"> Court Clerks Transportation Inspectors Assessors |
| <ul style="list-style-type: none"> Nurse Practitioners Pediatricians, General Respiratory Therapy Technicians | <ul style="list-style-type: none"> Opticians, Dispensing Psychiatric Technicians Medical & Health Services Managers | <ul style="list-style-type: none"> Dental Assistants Pharmacy Technicians Medical Transcriptionists |
| <ul style="list-style-type: none"> Tour Guides & Escorts Waiters & Waitresses Concierges | <ul style="list-style-type: none"> Lodging Managers Umpires & Referees Bartenders | <ul style="list-style-type: none"> Hotel Desk Clerks Reservation & Transportation Ticket Agents Food Service Managers |
| <ul style="list-style-type: none"> Clergy Rehabilitation Counselors Personal Care Aides | <ul style="list-style-type: none"> Skincare Specialists Manicurists & Pedicurists Credit Counselors | <ul style="list-style-type: none"> Barbers Religious Activity Directors Social & Human Service Assistants |
| <ul style="list-style-type: none"> Informatics Nurse Specialists | <ul style="list-style-type: none"> Computer Network Support Specialists Search Marketing Strategists Information Technology Project Managers | <ul style="list-style-type: none"> Computer Network Architects Web Administrators Database Administrators |
| <ul style="list-style-type: none"> Crossing Guards Animal Control Workers Probation Officers | <ul style="list-style-type: none"> Lawyers Sheriffs & Deputy Sheriffs Private Detectives & Investigators | <ul style="list-style-type: none"> Paralegals & Legal Assistants Security Guards Police, Fire, & Ambulance Dispatchers |
| <ul style="list-style-type: none"> Medical Appliance Technicians | <ul style="list-style-type: none"> Supervisors of Production & Operating Workers Production, Planning, & Expediting Clerks Supervisors of Mechanics, Installers & Repairers | <ul style="list-style-type: none"> Purchasing Agents Security and Fire Alarm Systems Installers Machinists |
| <ul style="list-style-type: none"> Supervisors of Retail Sales Workers Supervisors of Non-Retail Sales Workers | <ul style="list-style-type: none"> Real Estate Brokers Wholesale & Retail Buyers Parts Salespersons | <ul style="list-style-type: none"> Real Estate Sales Agents Cashiers Marketing Managers |
| <ul style="list-style-type: none"> Political Scientists | <ul style="list-style-type: none"> Industrial Engineers Economists Architectural & Engineering Managers | <ul style="list-style-type: none"> Social Science Research Assistants Quality Control Analysts Statisticians |
| <ul style="list-style-type: none"> Bus Drivers Flight Attendants Ambulance Drivers & Attendants | <ul style="list-style-type: none"> Aircraft Cargo Handling Supervisors Logisticians Taxi Drivers & Chauffeurs | <ul style="list-style-type: none"> Air Traffic Controllers Cargo & Freight Agents Dispatchers, Except Police, Fire, & Ambulance |

The 16 Career Clusters

Now that you have an idea of some jobs that match your interests, you're ready to explore the Career Clusters section. Using the page guide below, go to the clusters that best match your choices on pages 14-15. These pages will tell you more about the cluster, its pathways, and related jobs. Additionally, you can:

- View job descriptions, employment data, and wages for selected careers.
- Read a personal career story from someone working in the cluster.
- Find additional online career resources including O*NET OnLine, which provides detailed information about each occupation in the cluster.

| | | | |
|--|--|---|---|
| Agriculture, Food & Natural Resources  pg 17-22 | Architecture & Construction  pg 23-28 | Arts, Audio/Video Technology & Communications  pg 29-34 | Business Management & Administration  pg 35-40 |
| Education & Training  pg 41-46 | Finance  pg 47-52 | Government & Public Administration  pg 53-58 | Health Science  pg 59-64 |
| Hospitality & Tourism  pg 65-70 | Human Services  pg 71-76 | Information Technology  pg 77-82 | Law, Public Safety, Corrections & Security  pg 83-88 |
| Manufacturing  pg 89-94 | Marketing  pg 95-100 | Science, Technology, Engineering & Mathematics  pg 101-106 | Transportation, Distribution & Logistics  pg 107-112 |

Selected Careers Openings & Ratings Key

As you look at the Selected Careers in each career cluster, you'll notice stars in the columns for 10-Year Openings and Growth Rate. The ratings range from 1 to 5 stars. The higher the number of stars, the greater the number of openings or rate of growth.

| | | | | | |
|-----------|-------|-----------|------|------|------|
| Stars | ★★★★★ | ★★★★ | ★★★ | ★★ | ★ |
| Prospects | Best | Very Good | Good | Fair | Poor |



Agriculture, Food & Natural Resources

Think about life without agriculture, food and natural resources. What would we eat? Who would create and maintain the parks that help us relax and enjoy nature? How would we know whether our drinking water is safe? This industry has a huge impact on our daily lives, and — like other industries — technology has brought about changes in the way it operates.

Unmanned aircraft systems (UAS or drones) map natural resource areas to check forest health, evaluate soil erosion, and inventory wildlife populations. Large farms increasingly use GPS systems to help steer machinery more precisely and computer-based maps to prescribe amounts of fertilizer, seed, and chemicals for specific areas.

The Agriculture, Food and Natural Resources cluster contains occupations that require all levels of training. Nonfarm animal caretaker and refuse and recyclable materials collector positions are among the fastest-growing occupations that require the least training in this cluster. Jobs that usually require associate and bachelor's degrees such as environmental science and protection technicians, environmental engineers, and natural science managers are also projected to increase. Employers who often hire workers in this cluster include farmers; federal, state, and local governments; pest control businesses; and landscaping companies.

CAREER RESEARCH

- United States Department of Agriculture National Institute of Food and Agriculture
nifa.usda.gov
- National Sustainable Agriculture Information Service/Appropriate Technology Transfer for Rural Areas (ATTRA)
attra.ncat.org
- USDA New Farmers
newfarmers.usda.gov
- National FAA Organization
ffa.org/home
- Institute of Food Technologists
ift.org
- Soil Science Society of America
soils.org/students
- Nature Jobs
nature.com/naturejobs/science
- Conservation Job Board
conservationjobboard.com

Find more Agriculture, Food & Natural Resources occupations at onetonline.org/find/career?c=1



Core Skills

- Science
- Operation and Control
- Equipment Maintenance
- Repairing
- Equipment Selection
- Operation Monitoring
- Management of Material Resources
- Troubleshooting
- Management of Financial Resources
- Quality Control Analysis



AGRIBUSINESS SYSTEMS PATHWAY

OCCUP.

- **Management**
Farmers, Ranchers, and Other Agricultural Managers; Nursery and Greenhouse Managers; Farm and Ranch Managers; Aquacultural Managers.
- **Business & Financial Management**
Buyers and Purchasing Agents, Farm Products; Farm Labor Contractors



ANIMAL SYSTEMS PATHWAY

OCCUP.

- Farming, Fishing, & Forestry
Animal Breeders; Farmworkers, Farm, Ranch, and Aquacultural Animals
- Life, Physical, & Social Science
Animal Scientists
- Personal Care & Service
Nonfarm Animal Caretakers

FOOD PRODUCTS & PROCESSING SYSTEMS PATHWAY

OCCUPATION

- Farming, Fishing, & Forestry
First-Line Supervisors of Farming, Fishing & Forestry Workers; First-Line Supervisors of Logging Workers; First-Line Supervisors of Aquacultural Workers; First-Line Supervisors of Agricultural Crop and Horticultural Workers; First-Line Supervisors of Animal Husbandry and Animal Care Workers; Graders and Sorters, Agricultural Products
- Life, Physical, & Social Science
Food Scientists and Technologists; Agricultural and Food Science Technicians; Agricultural Technicians; Food Science Technicians

ENVIRONMENTAL SERVICE SYSTEMS PATHWAY

OCCUPATION

- Architecture & Engineering
Environmental Engineers; Environmental Engineering Technicians; Water/Wastewater Engineers
- Life, Physical, & Social Science
Environmental Science and Protection Technicians, Including Health
- Building & Grounds Cleaning & Maintenance
Pest Control Workers
- Construction & Extraction
Hazardous Materials Removal Workers
- Production
Water and Wastewater Treatment Plant and System Operators
- Transportation & Material Moving
Refuse and Recyclable Material Collectors

NATURAL RESOURCES SYSTEMS PATHWAY

OCCUPATION

- Management
Natural Sciences Managers; Clinical Research Coordinators; Water Resource Specialists
- Life, Physical & Social Science
Zoologists and Wildlife Biologists; Foresters; Geological and Petroleum Technicians; Geophysical Data Technicians; Geological Sample Test Technicians; Forest and Conservation Technicians
- Farming, Fishing, & Forestry
Fishers and Related Fishing Workers; Hunters and Trappers; Forest and Conservation Workers; Fallers; Logging Equipment Operators; Log Graders and Scalers

PLANT SYSTEMS PATHWAY

OCCUP.

- Life, Physical & Social Science
Soil and Plant Scientists; Biological Technicians
- Building & Grounds Cleaning & Maintenance
Pesticide Handlers, Sprayers, and Applicators, Vegetation; Tree Trimmers and Pruners
- Farming, Fishing, & Forestry
Farmworkers and Laborers, Crop, Nursery, and Greenhouse; Nursery Workers; Farmworkers and Laborers, Crop;

POWER, STRUCTURAL & TECHNICAL SYSTEMS PATHWAY

OCCUP.

- Architecture & Engineering
Agricultural Engineers
- Farming, Fishing, & Forestry
Agricultural Equipment Operators
- Installation, Maintenance, & Repair
Farm Equipment Mechanics and Service Technicians



Selected Careers

| Occupation* | Job Description |
|--|--|
| Agricultural & Food Science Technicians | Assist agricultural and food scientists by performing duties such as measuring and analyzing the quality of food and agricultural products. |
| Biological Technicians | Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. |
| Environmental Engineers | Use the principles of engineering, soil science, biology, and chemistry to create solutions to environmental problems. May focus on global issues such as unsafe drinking water, climate change, and environmental sustainability. |
| Environmental Science & Protection Technicians, Including Health | Monitor the environment and investigate sources of pollution and contamination, often under the supervision of environmental scientists and specialists. |
| Farm Equipment Mechanics & Service Technicians | Diagnose, adjust, repair, or overhaul farm machinery and vehicles such as tractors, harvesters, dairy equipment, and irrigation systems. |
| Farmworkers, Farm, Ranch, & Aquacultural Animals | Take care of living farm, ranch, or aquacultural animals that may include cattle, sheep, swine, goats, horses and other equines, poultry, finfish, shellfish, and bees. May feed, water, herd, graze, castrate, brand, de-beak, weigh, catch, and load animals. |
| Forest & Conservation Technicians | Provide technical assistance for conserving soil, water, forests, or related natural resources. May compile data about size, content, condition, and other characteristics of forest tracts. |
| Hazardous Materials Removal Workers | Identify, remove, pack, transport, or dispose of hazardous materials like asbestos, lead-based paint, waste oil, fuel, transmission fluid, radioactive materials, or contaminated soil. |
| Logging Equipment Operators | Drive logging tractors or wheeled vehicles equipped with one or more accessories such as a bulldozer blade, frontal shear, grapple, logging arch, cable winches, hoisting rack, or crane boom to carry out logging operations. |
| Natural Sciences Managers | Supervise scientists, including chemists, physicists, and biologists. Direct research and development activities, and coordinate activities like testing, quality control, and production. |
| Nonfarm Animal Caretakers | Provide care for animals. Feed, water, groom, bathe, and exercise pets and other nonfarm animals. Job tasks vary by position and place of work. |
| Pest Control Workers | Remove unwanted creatures such as roaches, rats, ants, bedbugs, and termites that infest buildings and surrounding areas. |
| Pesticide Handlers, Sprayers, & Applicators, Vegetation | Mix or apply pesticides, herbicides, fungicides, or insecticides through sprays, dusts, vapors, soil incorporation, or chemical application on trees, shrubs, lawns, or botanical crops. Usually must have specific training and State or Federal certification. |
| Refuse & Recyclable Material Collectors | Gather garbage and recyclables and move the materials to a dump, landfill, or recycling center. May drive garbage or recycling truck along a scheduled route. |
| Soil & Plant Scientists | Conduct research in breeding, physiology, production, yield, and management of crops, trees, shrubs, and nursery stock. Study the chemical composition of soils as they relate to plant or crop growth. |
| Tree Trimmers & Pruners | Use climbing and rigging techniques to cut away dead or excess branches to maintain the right-of-way for roads, sidewalks, or utilities. Work to improve the health, appearance, and value of trees. |
| Water & Wastewater Treatment Plant & System Operators | Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater. |
| Zoologists & Wildlife Biologists | Study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|---------------------------------------|------------------|----------------------------|--------------------------------|---|-----------------|
| Food Products & Processing Systems | ★★ | ★★ | \$26,380 / \$33,250 | Associate's degree | RIC |
| Plant Systems | ★★★★ | ★★ | \$30,140 / \$40,800 | Bachelor's degree | RIC |
| Environmental Service Systems | ★★★★ | ★★★★★ | \$55,180 / \$72,780 | Bachelor's degree | IRC |
| Environmental Service Systems | ★★★★ | ★★★★★ | \$30,260 / \$39,190 | Associate's degree | IRC |
| Power, Structural & Technical Systems | ★★ | ★★★★★ | \$25,890 / \$34,300 | High school diploma, long-term on-the- job training | RCI |
| Animal Systems | ★★★★★ | ★ | \$21,110 / \$26,250 | No formal educational credential | R |
| Natural Resources Systems | ★★ | ★ | \$30,660 / \$37,490 | Associate's degree | RIE |
| Environmental Service Systems | ★★★★ | ★★★★★★ | \$25,400 / \$31,740 | High school diploma, moderate-term on- the-job training | RC |
| Natural Resources Systems | ★★★★★ | ★★★★ | \$25,880 / \$36,080 | High school diploma, moderate-term on- the-job training | RIC |
| Natural Resources Systems | ★★★★ | ★★★★★ | \$95,350 / \$13,4390 | Bachelor's degree | EI |
| Animal Systems | ★★★★★★ | ★★★★★ | \$17,180 / \$19,570 | High school diploma, short-term on-the- job training | RC |
| Environmental Service Systems | ★★★★★ | ★★ | \$24,910 / \$31,810 | High school diploma, moderate-term on- the-job training | RC |
| Plant Systems | ★★ | ★★★★ | \$22,910 / \$29,440 | High school diploma, moderate-term on- the-job training | RC |
| Environmental Service Systems | ★★★★★★ | ★★★★★ | \$19,150 / \$27,890 | No formal educational credential | RC |
| Plant Systems | ★★★★ | ★★★★★ | \$45,830 / \$75,020 | Bachelor's degree | IR |
| Plant Systems | ★★★★★ | ★★★★ | \$25,430 / \$31,600 | High school diploma, short-term on-the- job training | R |
| Environmental Service Systems | ★★★★★ | ★★★★ | \$31,310 / \$40,060 | High school diploma, long-term on-the- job training | RC |
| Natural Resources Systems | ★★ | ★★ | \$37,900 / \$50,640 | Bachelor's degree | IR |



Career Story



Alena Yang

Mitchell Community College
Agribusiness Program

Alena Yang has growing plans for her future, figuratively and literally. One of Mitchell Community College's first Agribusiness graduates, Alena started at Mitchell in 2013 taking finance classes. When the Agribusiness program started in fall 2014, she shifted her program of study because of an interest that was sparked in high school.

"I love that—the understanding of 'hey, we're here to help you excel.'"

Agribusiness tied together her two passions of studying business and learning the science behind agriculture. In May 2016, Yang received her Associate in Applied Science degree in Agribusiness Technology.

Now a student at North Carolina Agricultural and Technical State University (NC A&T) in Greensboro, Yang notes she has found her calling in agricultural studies. "Studying agribusiness at Mitchell and NC A&T has really changed my perspective on how we transport, process, and consume commodities," Yang said.

Yang reflects that beginning her educational journey at the community college level has been nothing short of life-changing. "Mitchell Community College's Agribusiness program opened my eyes to how everything in the agriculture industry goes hand-in-hand," she said. "Being a part of this program has had a huge impact on my life."

One of Alena's favorite things about her community college experience is the connections she has made during her studies. Meeting a lot of different people from diverse backgrounds, she enjoyed finding similarities and building friendships. "The agribusiness program is like a small family. We all help each other," she noted. Yang recognizes how important this network has been and will be for her future.

The support Alena received at Mitchell made a huge impact on her journey. "The faculty and staff were so professional and knowledgeable!" she says. "Everyone is welcome, and everyone is welcoming. And I love that—the understanding of 'hey, we're here to help you and help you to excel.'"

While at NC A&T, Yang has had the opportunity to intern with the School of Agriculture, researching food scarcity in rural communities and food deserts. Yang plans to finish her bachelor's degree in agribusiness and food industry management with a certificate in entrepreneurship in May 2018.

Yang encourages others to explore the world of agriculture as an educational and career path. "If you are passionate about agriculture, the food system, or just in the business of agriculture, opportunities are out there to advance," she says. The future of agriculture is closely tied to sustainability. "Learning how to protect what we have and educating the next generation on how to do the same is so important. Knowing where your food comes from is key!"



Architecture & Construction

New York's One World Trade Center took 10 years to build. Who designed and constructed it? You're probably not surprised to learn that architects, civil engineers, construction laborers, cement masons and concrete finishers, and structural iron and steel workers participated in its development. You've also likely thought about the elevator installers and repairers who installed 73 elevators, or about the heating, air conditioning, and refrigeration mechanics and installers, plumbers, and electricians who created a healthy environment inside the tallest building in the Western Hemisphere.

Think a bit more deeply and you'll realize that cost estimators used their mathematic and analytic skills to help make decisions about the nearly \$4 billion spent to construct the building. Construction managers coordinated the work of specialty trade contractors to ensure they provided quality work in a timely manner.

While North Carolina may not build a skyscraper as tall as One World Trade Center any time soon, the state's construction industry is expected to grow and show increases in the occupations mentioned above. These occupations require educational backgrounds that range from high school diplomas to graduate degrees. Workers may find employment with plumbing, heating and air-conditioning contractors; landscaping businesses; electrical contractors; federal, state, and local government; and commercial building companies.

CAREER RESEARCH

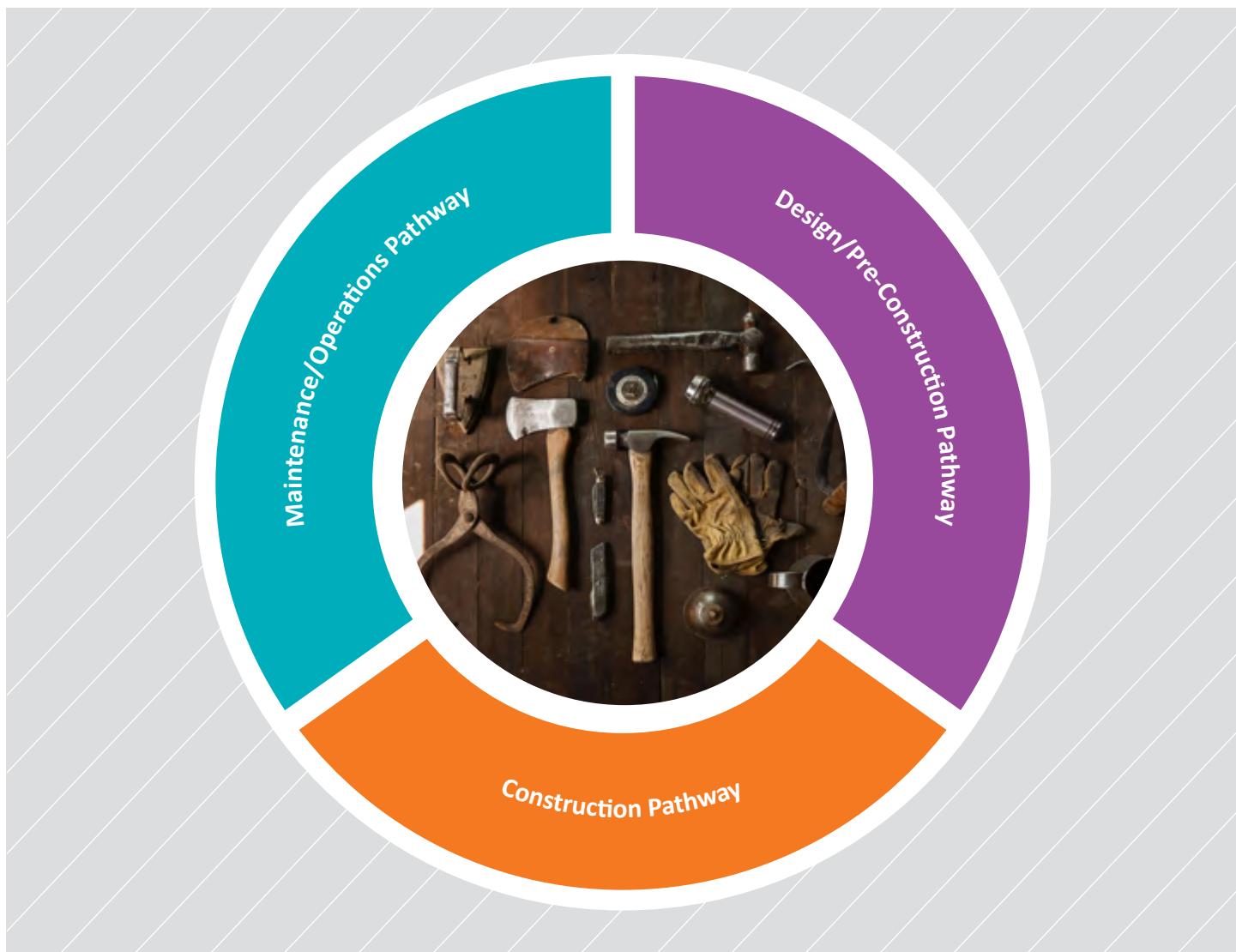
- The American Institute of Architects
aia.org
- Technology Student Association
tsaweb.org
- American Society of Civil Engineers
asce.org/student_resources
- The National Center for Construction Education and Research
nccer.org
- SkillsUSA
skillsusa.org
- US Green Building Council
new.usgbc.org
- Construction Jobs
constructionjobs.com

Find more Architecture & Construction occupations at onetonline.org/find/career?c=2



Core Skills

- Installation
- Repairing
- Equipment Maintenance
- Equipment Selection
- Operation and Control
- Troubleshooting
- Operation Monitoring
- Quality Control Analysis
- Coordination
- Management of Material Resources



DESIGN/PRE-CONSTRUCTION PATHWAY

OCCUPATION

- Business & Financial Operations
Cost Estimators
- Arts, Design, Entertainment, Sports, & Media
Interior Designers
- Architecture & Engineering
Architects, Except Landscape and Naval; Landscape Architects; Surveyors; Geodetic Surveyors; Civil Engineers; Transportation Engineers; Architectural and Civil Drafters; Architectural Drafters; Civil Drafters; Civil Engineering Technicians; Surveying and Mapping Technicians; Surveying Technicians; Mapping Technicians



CONSTRUCTION PATHWAY

OCCUPATION

- **Management**
Construction Managers
- **Installation, Maintenance, & Repair**
Manufactured Building and Mobile Home Installers; Riggers
- **Production**
Structural Metal Fabricators and Fitters
- **Transportation & Material Moving**
Conveyor Operators and Tenders; Crane and Tower Operators; Dredge Operators; Excavating and Loading Machine and Dragline Operators; Loading Machine Operators, Underground Mining; Hoist and Winch Operators
- **Construction & Extraction**
First-Line Supervisors of Construction Trades & Extraction Workers; Solar Energy Installation Managers; Brickmasons and Blockmasons; Stonemasons; Carpenters; Construction Carpenters; Rough Carpenters; Carpet Installers; Floor Layers, Except Carpet, Wood, and Hard Tiles; Floor Sanders and Finishers; Tile and Marble Setters; Cement Masons and Concrete Finishers; Terrazzo Workers and Finishers; Construction Laborers; Paving, Surfacing, and Tamping Equipment Operators; Pile-Driver Operators; Operating Engineers and Other Construction Equipment Operators; Drywall and Ceiling Tile Installers; Tapers; Electricians; Glaziers; Insulation Workers, Floor, Ceiling, and Wall; Insulation Workers, Mechanical; Painters, Construction and Maintenance; Paperhangers; Pipelayers; Plumbers, Pipefitters, and Steamfitters; Pipe Fitters and Steamfitters; Plumbers; Plasterers and Stucco Masons; Reinforcing Iron and Rebar Workers; Roofers; Sheet Metal Workers; Structural Iron and Steel Workers; Solar Photovoltaic Installers; Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters; Helpers--Carpenters; Helpers--Electricians; Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons; Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters; Helpers--Roofers; Fence Erectors; Segmental Pavers; Derrick Operators, Oil and Gas; Rotary Drill Operators, Oil and Gas; Service Unit Operators, Oil, Gas, and Mining; Earth Drillers, Except Oil and Gas; Explosives Workers, Ordnance Handling Experts, and Blasters; Continuous Mining Machine Operators; Mine Cutting and Channeling Machine Operators; Rock Splitters, Quarry; Roof Bolters, Mining; Roustabouts, Oil and Gas; Helpers--Extraction Workers

MAINTENANCE/OPERATIONS PATHWAY

OCCUPATION

- **Building & Grounds Cleaning & Maintenance**
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers; Landscaping and Groundskeeping Workers
- **Construction & Extraction**
Boilermakers; Elevator Installers and Repairers; Highway Maintenance Workers; Septic Tank Servicers and Sewer Pipe Cleaners; Solar Thermal Installers and Technicians; Weatherization Installers and Technicians
- **Installation, Maintenance, & Repair**
Mechanical Door Repairers; Control and Valve Installers and Repairers, Except Mechanical Door; Heating, Air Conditioning, and Refrigeration Mechanics and Installers; Heating and Air Conditioning Mechanics and Installers; Refrigeration Mechanics and Installers; Millwrights; Refractory Materials Repairers, Except Brickmasons; Electrical Power-Line Installers and Repairers; Commercial Divers; Helpers--Installation, Maintenance, and Repair Workers
- **Production**
Stationary Engineers & Boiler Operators





Selected Careers

| Occupation* | Job Description |
|---|--|
| Architects, Except Landscape & Naval | Plan and design houses, office buildings, and other structures. |
| Architectural & Civil Drafters | Prepare detailed drawings of architectural designs and plans for buildings and structures based on architects' specifications. Make drawings and topographical and relief maps used in civil engineering projects like highways, bridges, and pipelines. |
| Brickmasons & Blockmasons | Use bricks and concrete blocks to build fences, walkways, walls, and other structures. |
| Carpenters | Construct and repair building frameworks and structures, such as stairways, doorframes, partitions, and rafters, made from wood and other materials. May install kitchen cabinets, siding, and drywall. |
| Cement Masons & Concrete Finishers | Pour, smooth, and finish concrete floors, sidewalks, roads, and curbs using a variety of hand and power tools. |
| Civil Engineering Technicians | Apply theory and principles of civil engineering to plan, design, and oversee construction and maintenance of structures and facilities under the supervision of engineering staff or physical scientists. |
| Civil Engineers | Design, construct, supervise, operate and maintain construction projects and systems, including roads, buildings, airports, tunnels, dams, bridges, and water supply and sewage systems. |
| Construction Managers | Plan, coordinate, budget, and supervise construction projects from development to completion. |
| Cost Estimators | Collect and analyze data to estimate the time, money, materials, and labor needed to manufacture a product or provide a service. Usually specialize in a particular industry or type of product. |
| Crane & Tower Operators | Operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions. |
| Electrical Power-Line Installers & Repairers | Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light- or heavy-duty transmission towers. |
| Electricians | Install and maintain electrical power, communications, lighting, and control systems in homes, businesses, and factories. |
| First-Line Supervisors of Construction Trades & Extraction Workers | Directly supervise and coordinate activities of construction or extraction workers. |
| First-Line Supervisors of Landscaping, Lawn Service, & Groundskeeping Workers | Directly oversee and coordinate landscaping or groundskeeping staff work. May review contracts and prepare estimates of labor and materials costs. |
| Heating, Air Conditioning, & Refrigeration Mechanics & Installers | Work on heating, ventilation, cooling, and refrigeration systems that control the temperature and air quality in buildings. |
| Millwrights | Install, take apart, repair, reassemble, and move machinery in factories, power plants, and construction sites. |
| Operating Engineers & Other Construction Equipment Operators | Use construction equipment like bulldozers and front-end loaders to dig, move, and grade earth; erect structures; or pour concrete. May repair and maintain equipment. |
| Plumbers, Pipefitters, & Steamfitters | Install and repair pipes that carry liquids or gases to and within businesses, homes, and factories. |
| Sheet Metal Workers | Make or install products made from thin metal sheets such as the ducts used for heating and air conditioning. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|-------------------------|------------------|----------------------------|--------------------------------|--|-----------------|
| Design/Pre-Construction | ★★★ | ★★★ | \$59,530 / \$78,660 | Bachelor's degree | AI |
| Design/Pre-Construction | ★★★ | ★★ | \$35,720 / \$48,560 | Associate's degree | RI |
| Construction | ★★★★★ | ★★★★★ | \$28,030 / \$36,910 | High school diploma or equivalent | RCI |
| Construction | ★★★★★ | ★★★★★ | \$26,040 / \$35,060 | High school diploma or equivalent | RCI |
| Construction | ★★★★★ | ★★★★★ | \$25,270 / \$32,870 | No formal educational credential | RE |
| Design/Pre-Construction | ★★★★★ | ★★ | \$32,160 / \$45,470 | Associate's degree | RCI |
| Design/Pre-Construction | ★★★★★ | ★★★ | \$54,990 / \$74,790 | Bachelor's degree | RIC |
| Construction | ★★★★★ | ★★★★★ | \$63,650 / \$87,570 | Bachelor's degree | ERC |
| Design/Pre-Construction | ★★★★★ | ★★★★★ | \$38,260 / \$57,350 | Bachelor's degree | CE |
| Construction | ★★★ | ★★★★★ | \$40,100 / \$49,550 | High school diploma, moderate-term on-the-job training | RCI |
| Maintenance/Operations | ★★★★★ | ★★★★★ | \$38,230 / \$57,610 | High school diploma, long-term on-the-job training | RIC |
| Construction | ★★★★★ | ★★★★★ | \$32,680 / \$41,500 | High school diploma or equivalent | RIC |
| Construction | ★★★★★ | ★★★★★ | \$40,820 / \$56,330 | High school diploma or equivalent | ERC |
| Maintenance/Operations | ★★★★★ | ★★★ | \$33,750 / \$47,860 | High school diploma or equivalent | ERC |
| Maintenance/Operations | ★★★★★ | ★★★★★ | \$30,590 / \$40,320 | Postsecondary nondegree award | RC |
| Maintenance/Operations | ★★ | ★★★★★ | \$30,390 / \$44,260 | High school diploma or equivalent | RCI |
| Construction | ★★★★★ | ★★★★★ | \$28,460 / \$35,890 | High school diploma, moderate-term on-the-job training | RCI |
| Construction | ★★★★★ | ★★★★★ | \$32,160 / \$41,280 | High school diploma or equivalent | RC |
| Construction | ★★★★★ | ★★★★★ | \$24,120 / \$34,010 | High school diploma or equivalent | R |



Career Story



Justin Johnson

Wake Technical Community College
Diploma, Plumbing

Justin Johnson was on track to graduate from high school when circumstances threw a wrench into his plans. He dropped out of school to go to work to help support his

“I wanted to make something of myself.”

family. He worked odd jobs for years before deciding to get his GED at Wake Tech. “I wanted to make something of myself,” he says.

Justin earned his GED, but he wasn't ready to stop there. He wanted to further his education and decided to enroll in the plumbing program at Wake Tech Community College. Why plumbing? “It was hands-on,” he says, “and it challenged me. I knew I didn't want a desk job!”

While still a student, Justin got a job at Guilford Plumbing Supply Company and started learning the nuts and bolts of the industry. He says he'd like to own his own business someday, but for now, he takes great pride in being the first in his family to go to college – and satisfaction in knowing he's building skills that can help him create a better life for himself and others. “It's a pride thing,” Justin says. “I want to look back and say I helped people.”



Tell Me About...

PLUMBERS

Plumbers install and repair pipes, fittings, or fixtures of heating, water or drainage systems, according to specifications or plumbing codes. They typically do the following:

- Assemble pipe sections, tubing, or fittings using equipment
- Install pipe components, appliances, or fixtures
- Keep records of work assignments
- Detect and locate leaks by filling pipes or fixtures with water or air and observing pressure gauges
- Direct helpers who assist with pipe cutting, preassembly, or installation
- Maintain or repair plumbing components
- Use measuring equipment to locate and mark position of plumbing components
- Use hand or power tools to measure, cut, thread, or bend pipe to required angle
- Study blueprints and follow state and local building codes

For more information about this career and 560 other occupations:
nccareers.org/occupationalprofiles/index.html





Arts, Audio/Video Technology & Communications

Cultural and leisure activities help us balance our work and personal lives. In Arts, Audio/Video Technology and Communications, a great variety of workers give us movies, paintings, music downloads, books, and museums. Actors, artists, musicians, and writers obviously make their living in jobs that are part of this cluster. Less evident are the employees who work in the background at occupations like set designers, agents and business managers, audio and video equipment technicians, and print binding and finishing workers.

As in many clusters, technology has required workers to learn new skills. Lighting and sound systems are quite different than they were even a decade ago, providing new multimedia options for staging performances and exhibits. Publishers now use technologies to create e-books that are far different from those used for print versions.

Several Arts, Audio/Video Technology and Communications cluster careers are likely to have strong growth over the next decade. Among them are technical writers, telecommunications line installers and repairers, and audio and video equipment technicians. Approximately two-thirds of the careers in this industry require postsecondary education, especially a bachelor's degree. Industries that often have employment for this cluster's workers include wired telecommunication companies, newspaper publishers (print and electronic), commercial printing companies, television stations, and electrical contractors.

CAREER RESEARCH

- Actors' Equity Association
actorsequity.org/home.asp
- The Society of Professional Audio Recording Services
spars.com
- Technology Student Association
tsaweb.org
- The Association for Women in Sports Media
awsmonline.org
- The National Scholastic Press Association
studentpress.org/nspsa
- NC Arts Council
ncarts.org/artist-opportunities
- AV Job Listing
avjoblistings.com

Find more Arts, Audio/Video Technology & Communications occupations at oneline.org/find/career?c=3



Core Skills

- Operations Analysis
- Coordination
- Time Management
- Persuasion
- Writing
- Negotiation
- Speaking
- Reading Comprehension
- Social Perceptiveness
- Active Listening



PERFORMING ARTS PATHWAY

OCCUPATION

- Business & Financial Operations
Agents and Business Managers of Artists, Performers, and Athletes
- Personal Care & Service
Costume Attendants; Makeup Artists, Theatrical and Performance
- Arts, Design, Entertainment, Sports, & Media
Actors; Producers and Directors; Producers; Directors- Stage, Motion Pictures, Television, and Radio; Program Directors; Talent Directors; Technical Directors/Managers; Dancers; Choreographers; Music Directors and Composers; Music Directors; Music Composers and Arrangers; Musicians and Singers; Singers; Musicians, Instrumental; Public Address System and Other Announcers



PRINTING TECHNOLOGY PATHWAY

OCCUP.

- **Office & Administrative Support**
Desktop Publishers; Proofreaders and Copy Markers
- **Production**
Prepress Technicians and Workers; Printing Press Operators; Print Binding and Finishing Workers

TELECOMMUNICATIONS PATHWAY

OCCUP.

- **Installation, Maintenance, & Repair**
Telecommunications Equipment Installers and Repairers, Except Line Installers; Telecommunications Line Installers and Repairers

VISUAL ARTS PATHWAY

OCCUP.

- **Arts, Design, Entertainment, Sports, & Media**
Art Directors; Craft Artists; Fine Artists, Including Painters, Sculptors, and Illustrators; Multimedia Artists and Animators; Commercial and Industrial Designers; Fashion Designers; Floral Designers; Graphic Designers; Set and Exhibit Designers

JOURNALISM & BROADCASTING PATHWAY

OCCUP.

- **Arts, Design, Entertainment, Sports, & Media**
Radio and Television Announcers; Broadcast News Analysts; Reporters and Correspondents; Editors; Technical Writers; Writers and Authors; Copy Writers; Poets, Lyricists and Creative Writers; Audio and Video Equipment Technicians; Broadcast Technicians; Radio Operators; Sound Engineering Technicians; Photographers; Camera Operators, Television, Video, and Motion Picture; Film and Video Editors





Selected Careers

| Occupation* | Job Description |
|---|--|
| Art Directors | Develop design concepts and presentation approaches for visual communications media, such as print, broadcasting, and advertising. Direct workers engaged in art work or layout design. |
| Audio & Video Equipment Technicians | Set up, or set up and operate audio and video equipment like microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, and sound and mixing boards. |
| Broadcast Technicians | Set up, operate, and maintain electronic equipment used to transmit radio and television programs. |
| Commercial & Industrial Designers | Develop and design manufactured products like cars, home appliances, and children's toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design. |
| Editors | Plan, coordinate, or edit content of material for publication. May review proposals and drafts for publication. |
| Fine Artists, Including Painters, Sculptors, & Illustrators | Use a variety of materials and techniques to create art for sale and exhibition. Create original works of art more for their aesthetic value rather than for functionality. |
| Floral Designers | Design, cut, and arrange live, dried, or artificial flowers and foliage. |
| Graphic Designers | Create visual concepts — by hand or using computer software — to communicate ideas that inspire, inform, or captivate consumers. Develop the overall layout and production design for advertisements, brochures, magazines, and corporate reports. |
| Multimedia Artists & Animators | Create special effects, animation and visual images for television, movies, video games, and other media. May make two- and three-dimensional models and animation, showing objects in motion or illustrating a process. |
| Musicians & Singers | Play instruments or sing for live audiences and in recording studios. Perform in a variety of styles such as classical, jazz, opera, hip-hop, or rock. |
| Photographers | Use technical expertise, creativity, and composition skills to produce and preserve images that visually tell a story or record an event. |
| Prepress Technicians & Workers | Format and proof text and images submitted by designers and clients into finished pages that can be printed. |
| Printing Press Operators | Set up and operate digital, letterpress, lithographic, flexographic, gravure, or other printing machines. |
| Producers & Directors | Create motion pictures, television shows, live theater, and other performing arts productions. Interpret a writer's script to entertain or inform an audience. |
| Reporters & Correspondents | Collect and analyze facts about newsworthy events through interviews, investigation, or observation. Report and write stories for newspapers, news magazines, radio, or television. |
| Technical Writers | Write and edit technical materials like equipment manuals, journal articles, or operating and maintenance instructions. Communicate difficult information so that it is easier to read and may also help in laying out their writing. |
| Telecommunications Equipment Installers & Repairers, Except Line Installers | Set up and maintain devices or equipment that carry communications signals, connect to telephone lines, or access the Internet. |
| Telecommunications Line Installers & Repairers | Install or repair telecommunications cables, including fiber optics. |
| Writers & Authors | Develop written content for advertisements, books, magazines, movie and television scripts, songs, and online publications. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|---------------------------|------------------|----------------------------|--------------------------------|--|-----------------|
| Visual Arts | ★★ | ★★ | \$53,200 / \$78,100 | Bachelor's degree | AE |
| Journalism & Broadcasting | ★★★★ | ★★★★★ | \$24,300 / \$36,700 | Postsecondary nondegree award | RIC |
| Journalism & Broadcasting | ★★ | ★ | \$25,030 / \$38,900 | Associate's degree | RCI |
| Visual Arts | ★★★★ | ★★★★ | \$44,640 / \$70,850 | Bachelor's degree | AER |
| Journalism & Broadcasting | ★★★★ | ★ | \$32,100 / \$49,290 | Bachelor's degree | AEC |
| Visual Arts | ★★★★ | ★★★★ | \$30,270 / \$44,430 | Bachelor's degree | AR |
| Visual Arts | ★★★★ | ★ | \$19,810 / \$29,120 | High school diploma or equivalent | AER |
| Visual Arts | ★★★★★ | ★★ | \$29,390 / \$43,840 | Bachelor's degree | ARE |
| Visual Arts | ★★★★ | ★★★★ | \$37,550 / \$58,820 | Bachelor's degree | AI |
| Performing Arts | ★★ | ★★★★★ | \$10.06 / \$17.94 (hourly) | No formal educational credential | AE |
| Journalism & Broadcasting | ★★★★★ | ★★ | \$17,940 / \$24,790 | High school diploma, long-term on-the-job training | AR |
| Printing Technology | ★★ | ★ | \$29,280 / \$38,640 | Postsecondary nondegree award | RC |
| Printing Technology | ★★★★★ | ★ | \$22,440 / \$34,170 | High school diploma, moderate-term on-the-job training | RC |
| Performing Arts | ★★★★ | ★★★★ | \$32,670 / \$52,010 | Bachelor's degree | EA |
| Journalism & Broadcasting | ★★★★ | ★ | \$23,490 / \$31,020 | Bachelor's degree | AEI |
| Journalism & Broadcasting | ★★★★★ | ★★★★★ | \$51,160 / \$74,350 | Bachelor's degree | AIC |
| Telecommunications | ★★★★★ | ★★ | \$34,180 / \$49,730 | Postsecondary nondegree award | RIC |
| Telecommunications | ★★★★★ | ★★★★★ | \$23,050 / \$35,710 | High school diploma, long-term on-the-job training | RE |
| Journalism & Broadcasting | ★★★★★ | ★★ | \$37,190 / \$60,100 | Bachelor's degree | A |



Career Story



Brandon Dellinger

South Piedmont Community College
A.A.S., Advertising and Graphic Design

Brandon liked to draw and paint as a child, never knowing that one day his passion for art could turn into a viable career. He graduated from the Anson County Early College High School with not only his diploma but also an Associate in Arts Degree from South Piedmont Community College.

Brandon has found that creative work often leads to overcoming failure.

He spent the next six years working in a variety of part-time jobs, but knew he wanted to eventually move into a creative field, so he enrolled in the Advertising and Graphic Design program at South Piedmont Community College. Because of the college credits he earned while in high

school, he finished his Associate in Applied Science Degree in Advertising and Graphic Design in one year.

“Working as a freelance graphic designer allows me the freedom to pick and choose the projects and clients I work with. As of now, I enjoy working on Identity Design, Brand Strategy, Hand Lettering, and Illustration projects.”

Brandon has found that creative work often leads to overcoming failure. He discovered that he had to allow himself the freedom to try a new approach to a graphic arts problem and try out things that might fail and never be used.

The flexibility of freelancing also allows Brandon to work part-time in a local print shop and to teach part-time in Advertising and Graphic Design at South Piedmont Community College.

Even with all the work he is doing, Brandon has carved out time to work on a Bachelor's Degree in Graphic Design and Media Arts.



Tell Me About...

GRAPHIC DESIGNERS

Graphic designers create visual concepts — by hand or using computer software — to communicate ideas that inspire, inform, or captivate consumers. They typically do the following:

- Meet with clients or the art director to determine the scope of a project
- Advise clients on strategies to reach a particular audience
- Determine the message the design should portray
- Create images that identify a product or convey a message
- Develop graphics for product illustrations, logos, and websites
- Select colors, images, text style, and layout
- Present the design to clients or the art director

For more information about this career and 560 other occupations:
nccareers.org/occupationalprofiles/index.html





Business Management & Administration

In North Carolina, we are likely to see new job growth in the Business Management and Administration career cluster in the next decade. Since almost any workplace benefits from strong leadership and organizational support, business management occupations exist in all industries.

Many of us value the peace of mind that comes from knowing that we have other options if we lose our current jobs. More than most clusters, business administration includes careers that move relatively easily from one industry or location to another. Several years ago, the U.S. Bureau of Labor Statistics listed a dozen careers that offer this kind of flexibility. Half of the occupations are in this cluster:

- Customer service representatives
- Secretaries and administrative assistants, except legal, medical, and executive
- General and operations managers
- General office clerks
- Management analysts
- Human resources specialists

Work environments match the functions of specific businesses. While desk jobs with 8-to-5 schedules are typical, business and management workers in industries like transportation and construction may have variable schedules and need to travel to jobsites or work in the outdoors. Educational backgrounds for these jobs range from high school through bachelor's degrees. Places offering employment include — but are not limited to — corporate and regional management offices; federal, state, and local governments; temporary service agencies; banks; and public colleges and universities.

CAREER RESEARCH

- Association for Talent Development (ATD) td.org
- Business Professionals of America bpa.org
- Future Business Leaders of America/Phi Beta Lambda fbla-pbl.org
- Professionals In Human Resources Association™ pihra.org
- Project Management Institute® pmi.org
- DECA deca.org
- Administration Jobs administrationjobs.com

Find more Business Management & Administration occupations at onetonline.org/find/career?c=4



Core Skills

- Management of Financial Resources
- Management of Material Resources
- Negotiation
- Management of Personnel Resources
- Persuasion
- Service Orientation
- Systems Analysis
- Systems Evaluation
- Writing
- Coordination



BUSINESS INFORMATION MANAGEMENT PATHWAY

OCCUP.

- Business & Financial Operations
Computer and Information Systems Managers



ADMINISTRATIVE SUPPORT PATHWAY

OCCUPATION

• Office & Administrative Support

First-Line Supervisors of Office and Administrative Support Workers; Switchboard Operators, Including Answering Service; Telephone Operators; Bookkeeping, Accounting, and Auditing Clerks; Payroll and Timekeeping Clerks; Procurement Clerks; Correspondence Clerks; Customer Service Representatives; Patient Representatives; File Clerks; Interviewers, Except Eligibility and Loan; Library Assistants, Clerical; New Accounts Clerks; Order Clerks; Human Resources Assistants, Except Payroll and Timekeeping; Receptionists and Information Clerks; Meter Readers, Utilities; Postal Service Clerks; Postal Service

Mail Carriers; Postal Service Mail Sorters, Processors, and Processing Machine Operators; Shipping, Receiving, and Traffic Clerks; Stock Clerks and Order Fillers; Stock Clerks, Sales Floor; Marking Clerks; Stock Clerks- Stockroom, Warehouse, or Storage Yard; Order Fillers, Wholesale and Retail Sales; Executive Secretaries and Executive Administrative Assistants; Secretaries and Administrative Assistants, Except Legal, Medical, and Executive; Computer Operators; Data Entry Keyers; Word Processors and Typists; Mail Clerks and Mail Machine Operators, Except Postal Service; Office Clerks, General; Office Machine Operators, Except Computer

GENERAL MANAGEMENT PATHWAY

OCCUP.

• Management

Chief Executives; Chief Sustainability Officers; General and Operations Managers; Regulatory Affairs Managers; Compliance Managers; Investment Fund Managers; Supply Chain Managers; Security

Managers; Loss Prevention Managers; Wind Energy Operations Managers; Wind Energy Project Managers; Brownfield Redevelopment Specialists and Site Managers

HUMAN RESOURCES PATHWAY

OCCUP.

• Management

Compensation and Benefits Managers; Human Resources Managers; Training and Development Managers

• Business & Financial Operations

Human Resources Specialists; Labor Relations Specialists; Compensation, Benefits, and Job Analysis Specialists; Training and Development Specialists

OPERATIONS MANAGEMENT PATHWAY

OCCUPATION

• Management

Administrative Services Managers; Industrial Production Managers; Quality Control Systems Managers; Geothermal Production Managers; Biofuels Production Managers; Biomass Power Plant Managers; Methane/Landfill Gas Collection System Operators; Hydroelectric Production Managers; Purchasing Managers

• Business & Financial Operations

Management Analysts; Meeting, Convention, and Event Planners; Fundraisers; Energy Auditors; Security Management Specialists; Customs Brokers; Business Continuity Planners; Sustainability Specialists; Online Merchants

• Computer & Mathematical

Operations Research Analysts





Selected Careers

| Occupation* | Job Description |
|---|--|
| Administrative Services Managers | Plan, direct, and coordinate supportive services of an organization. May keep records and maintain facilities. Depending on organization size, direct all support services or serve as one of several specialized administrative managers. |
| Chief Executives | Develop strategies and policies to make sure that an organization meets its goals. Plan, direct, and coordinate the operations of companies and organizations. |
| Compensation & Benefits Managers | Plan, direct, or coordinate compensation and benefits activities of an organization. |
| Compensation, Benefits, & Job Analysis Specialists | Carry out an organization's salary and benefits programs. Evaluate job positions to determine details such as classification and salary. |
| Computer & Information Systems Managers | Plan, coordinate, and direct computer-related activities in an organization. Help determine the organization's IT (information technology) goals and implement computer systems to meet those goals. |
| Customer Service Representatives | Handle customer complaints, process orders, and provide information about an organization's products and services. |
| First-Line Supervisors of Office & Administrative Support Workers | Directly supervise and coordinate the activities of clerical and administrative support workers. |
| Fundraisers | Organize events and campaigns to raise money and other donations for an organization. May design promotional materials to increase awareness of an organization's work, goals, and financial needs. |
| General & Operations Managers | Plan, direct, or coordinate the operations of organizations. Duties and responsibilities are too diverse and general to be classified in any one area of management or administration. |
| Human Resources Assistants, Except Payroll & Timekeeping | Compile and keep personnel records. Record employee data such as addresses, earnings, absences, amount of sales or production, supervisory reports, and date of and reason for termination. |
| Human Resources Managers | Plan, direct, and coordinate an organization's administrative functions. Oversee recruiting, interviewing, and hiring of new staff; consult with executives on strategic planning; and serve as a link between management and employees. |
| Human Resources Specialists | Recruit, screen, interview, and place workers. Often handle other human resources work, such as those related to employee relations, payroll and benefits, and training. |
| Industrial Production Managers | Plan, direct, or coordinate the work activities and resources needed for manufacturing products within cost, quality, and quantity specifications. |
| Interviewers, Except Eligibility & Loan | Interview persons by telephone, mail, in person, or by other means to complete forms, applications, or questionnaires. Ask specific questions, record answers, and help people complete forms. |
| Management Analysts | Propose ways to improve an organization's efficiency. Advise managers on how to make organizations more profitable through reduced costs and increased revenues. |
| Meeting, Convention, & Event Planners | Coordinate all aspects of professional meetings, events, and conventions. Choose meeting locations, arrange transportation, and coordinate other details. |
| New Accounts Clerks | Interview people who want to open accounts in financial institutions. Explain available account services to potential customers and help them prepare account applications. |
| Operations Research Analysts | Use advanced mathematical and analytical methods to help organizations solve problems and make better decisions. |
| Purchasing Managers | Plan, direct, or coordinate the activities of buyers, purchasing officers, and related workers who are involved in purchasing materials, products, and services. |
| Training & Development Managers | Plan, direct, and coordinate programs to enhance an organization's employees' knowledge and skills. Oversee a staff of training and development specialists. |
| Training & Development Specialists | Help plan, conduct, and administer programs that train employees and improve their skills and knowledge. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|---------------------------------|------------------|----------------------------|--------------------------------|---|-----------------|
| Operations Management | ★★★★★ | ★★★★★ | \$64,650 / \$93,100 | Bachelor's degree | EC |
| General Management | ★★★★★ | ★★ | \$126,200 / 181,210# | Bachelor's degree | EC |
| Human Resources Management | ★★ | ★★★★★ | \$83,310 / \$132,330 | Bachelor's degree | ECS |
| Human Resources Management | ★★★ | ★★★ | \$41,940 / \$57,410 | Bachelor's degree | CE |
| Business Information Management | ★★★★★ | ★★★★★ | \$93,390 / \$130,750 | Bachelor's degree | ECI |
| Administrative Support | ★★★★★ | ★★★★★ | \$21,270 / \$31,200 | High school diploma, short-term on-the- job training | ESC |
| Administrative Support | ★★★★★ | ★★★★★ | \$35,430 / \$51,690 | High school diploma or equivalent | ECS |
| Operations Management | ★★★★★ | ★★★★★ | \$35,900 / \$50,810 | Bachelor's degree | ECA |
| General Management | ★★★★★ | ★★★★★ | \$64,510 / \$109,730 | Bachelor's degree | ECS |
| Administrative Support | ★★★★★ | ★★ | \$25,140 / \$35,800 | Associate's degree | CES |
| Human Resources Management | ★★★★★ | ★★★★★ | \$75,800 / \$105,380 | Bachelor's degree | ESC |
| Human Resources Management | ★★★★★ | ★★★ | \$38,360 / \$56,110 | Bachelor's degree | ECS |
| Operations Management | ★★★★★ | ★★ | \$69,880 / \$97,120 | Bachelor's degree | EC |
| Administrative Support | ★★★★★ | ★★★ | \$24,880 / \$29,860 | High school diploma, short-term on-the- job training | CES |
| Operations Management | ★★★★★ | ★★★★★ | \$50,310 / \$79,920 | Bachelor's degree | IEC |
| Operations Management | ★★★★★ | ★★★★★ | \$27,870 / \$43,600 | Bachelor's degree | ECS |
| Administrative Support | ★★★ | ★★ | \$33,580 / \$43,320 | High school diploma, moderate-term on- the-job training | CES |
| Operations Management | ★★★ | ★★★★★ | \$46,390 / \$67,670 | Bachelor's degree | ICE |
| Operations Management | ★★★ | ★★★★★ | \$77,760 / \$107,580 | Bachelor's degree | EC |
| Human Resources Management | ★★ | ★★★★★ | \$78,040 / \$115,900 | Bachelor's degree | ES |
| Human Resources Management | ★★★★★ | ★★★★★ | \$38,930 / \$61,050 | Bachelor's degree | SAC |

US Median Data

Career Story



Meghan Nevil

Isothermal Community College

A.A.S., Business Administration

*Certificates: Business Administration, Economics,
& Office Administration*

Not long after Meghan Nevil completed her Associate Degree in Business Administration at Isothermal Community College, she found herself working in her dream job as the Research and Grants Analyst at Haywood Community College.

"I am a product of how successful the North Carolina Community College System is."

Meghan graduated from Isothermal with certificates in Business Administration, Economics and Office Administration in addition to her degree.

"When I first started at Isothermal, I didn't know what I wanted to do. I just knew that I wanted to go back to school and possibly get a degree," said Meghan. "Within the first

year, I changed my program to Business Administration, became a member of Phi Beta Lambda and the Student Government Association, and started working as a work-study student for the Office of Assessment, Planning, and Research."

That work-study position primed her for her new career at Haywood.

"I am so thankful that I am able to stay within the community college system, because I am a product of how successful the North Carolina Community College System is," she said. "I feel fortunate that with my current position, I am able to give back."

Meghan offers some valuable advice for students looking to find new careers.

"Don't forget to ask for help, and don't feel afraid to access the writing labs, or computer labs on campus," Meghan said. "This helped me stay focused and allowed me to accomplish my goals. And most importantly, be proud of your decision to continue your education. It won't always be easy, but it will be worth it."



Tell Me About...

POSTSECONDARY EDUCATION ADMINISTRATORS

Postsecondary education administrators oversee student services, academics, and faculty research at colleges and universities. Job duties vary depending on the college area that they manage, such as admissions, office of the registrar, or student affairs. Their tasks may include the following:

- Determine how many students to admit
- Prepare promotional materials about the school
- Meet with prospective students and encourage them to apply
- Review applications to decide whether to admit each potential student
- Analyze data about applicants and admitted students

For more information about this career and 560 other occupations:

nccareers.org/occupationalprofiles/index.html





Education & Training

Lifelong learning is a phrase that we often hear. Finishing high school and other required training is the first step toward getting a job, and keeping our jobs often requires that we continue to update our skills. To meet these ongoing training needs, education options have broadened to include online training. Technology like electronic textbooks, notebooks, and smart boards support classroom innovations while also requiring educators to upgrade their technology skills and teaching techniques.

Most occupations in the Education and Training cluster require at least a bachelor's degree, with many postsecondary teaching professionals holding a doctoral or professional degree. Occupations likely to grow the most over the next 10 years are likely to include elementary and secondary school teachers as well as teacher assistants. College-level health specialties teachers occupy the top position for highest estimated percentage increase in jobs.

Schedules for education workers vary by work setting. Preschool through high school employees work directly with students for approximately eight hours and often devote additional time at home to grading papers and planning lessons. Before and after-school workers' schedules revolve around times when students aren't in class, and coaches may work directly with students for hours beyond the usual class schedule. Industries that tend to offer many jobs for workers in this cluster include public and private schools, colleges and universities, and daycare centers.

CAREER RESEARCH

- Association for Career & Technical Education acteonline.org
- National Coordinating Council for Career and Technical Student Organizations ctsos.org
- Future Educators Association futureeducators.org
- TEACH teach.org
- Teaching jobs teachers-teachers.com
- K-12 jobs k12jobs.com
- National Association of Special Education Teachers naset.org
- School Spring schoolspring.com
- National Science Teachers Association nsta.org
- NC Department of Public Instruction ncpublicschools.org
- NC Community College System nccommunitycolleges.edu

Find more Education & Training occupations at onetonline.org/find/career?c=5



Core Skills

- Learning Strategies
- Instructing
- Writing
- Speaking
- Active Learning
- Reading Comprehension
- Systems Evaluation
- Active Listening
- Monitoring
- Social Perceptiveness



PROFESSIONAL SUPPORT SERVICES PATHWAY

OCCUP.

- **Education, Training & Library**
Archivists; Curators; Museum Technicians and Conservators; Librarians; Library Technicians; Audio-Visual and Multimedia Collections Specialists; Instructional Coordinators; Instructional Designers and Technologists
- **Community & Social Service**
Educational, Guidance, School and Vocational Counselors
- **Arts, Design, Entertainment, Sports, & Media**
Interpreters and Translators



TEACHING/TRAINING PATHWAY

OCCUPATION

- Arts, Design, Entertainment, Sports, & Media
Coaches and Scouts

- Education, Training, & Library

Business Teachers, Postsecondary; Computer Science Teachers, Postsecondary; Mathematical Science Teachers, Postsecondary; Architecture Teachers, Postsecondary; Engineering Teachers, Postsecondary; Agricultural Sciences Teachers, Postsecondary; Biological Science Teachers, Postsecondary; Forestry and Conservation Science Teachers, Postsecondary; Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary; Chemistry Teachers, Postsecondary; Environmental Science Teachers, Postsecondary; Physics Teachers, Postsecondary; Anthropology and Archeology Teachers, Postsecondary; Area, Ethnic, and Cultural Studies Teachers, Postsecondary; Economics Teachers, Postsecondary; Geography Teachers, Postsecondary; Political Science Teachers, Postsecondary; Psychology Teachers, Postsecondary; Sociology Teachers, Postsecondary; Health Specialties Teachers, Postsecondary; Nursing Instructors and Teachers, Postsecondary; Education Teachers, Postsecondary; Library Science Teachers, Postsecondary; Criminal Justice and Law Enforcement Teachers, Postsecondary;

Law Teachers, Postsecondary; Social Work Teachers, Postsecondary; Art, Drama, and Music Teachers, Postsecondary; Communications Teachers, Postsecondary; English Language and Literature Teachers, Postsecondary; Foreign Language and Literature Teachers, Postsecondary; History Teachers, Postsecondary; Philosophy and Religion Teachers, Postsecondary; Graduate Teaching Assistants; Home Economics Teachers, Postsecondary; Recreation and Fitness Studies Teachers, Postsecondary; Vocational Education Teachers, Postsecondary; Preschool Teachers, Except Special Education; Kindergarten Teachers, Except Special Education; Elementary School Teachers, Except Special Education; Middle School Teachers, Except Special and Career/Technical Education; Career/Technical Education Teachers, Middle School; Secondary School Teachers, Except Special and Career/Technical Education; Career/Technical Education Teachers, Secondary School; Special Education Teachers, Preschool; Special Education Teachers, Kindergarten and Elementary School; Special Education Teachers, Middle School; Special Education Teachers, Secondary School; Adapted Physical Education Specialists; Adult Basic and Secondary Education and Literacy Teachers and Instructors; Self-Enrichment Education Teachers; Tutors; Farm and Home Management Advisors; Teacher Assistants

ADMINISTRATION & ADMINISTRATIVE SUPPORT PATHWAY

OCCUP.

- Management

Education Administrators, Preschool and Childcare Center/Program; Education Administrators, Elementary and Secondary School;

Education Administrators, Postsecondary; Distance Learning Coordinators; Fitness and Wellness Coordinators





Selected Careers

| Occupation* | Job Description |
|--|--|
| Adult Basic & Secondary Education & Literacy Teachers & Instructors | Teach adults basic skills like reading, writing, and speaking English. May also help students earn a high school diploma. |
| Chemistry Professors | Teach college students in courses about the chemical and physical properties and compositional changes of substances. |
| Coaches & Scouts | Teach athletes the skills they need to succeed at their sport. Look for new players, evaluating their skills and chances for success at college, amateur, or professional levels. |
| Criminal Justice & Law Enforcement Professors | Instruct college students in criminal justice, corrections, and law enforcement administration courses. Conduct research and publish scholarly papers and books. |
| Education Administrators, Elementary & Secondary School | Responsible for managing all school operations. Oversee daily school activities, the curriculum, teachers, and other school staff to provide a safe, productive learning environment. |
| Education Administrators, Preschool & Childcare Center/Program | Direct and lead staff, oversee daily activities, and prepare plans and budgets. Responsible for all aspects of the program. |
| Educational, Guidance, School, & Vocational Counselors | Counsel individuals and provide group educational and career guidance services. |
| Elementary School Teachers, Except Special Education | Prepare younger students for future schooling by teaching them basic subjects such as math and reading. |
| Health Specialties Professors | Teach college courses in health specialties fields such as dentistry, laboratory technology, medicine, pharmacy, public health, therapy, and veterinary medicine. |
| Instructional Coordinators | Oversee school curriculums and teaching standards. Develop instructional material, coordinate how teachers and principals use the curriculum, and evaluate its effectiveness. |
| Library Technicians | Assist librarians by helping readers use library catalogs, databases, and indexes to locate books and other materials and by answering questions about standard references. |
| Middle School Teachers, Except Special & Career/Technical Education | Help students build on elementary school fundamentals and prepare them for the more difficult curriculum they will face in high school. Usually educate students in sixth through eighth grades. |
| Nursing Professors | Demonstrate and teach patient care in classroom and clinical units to college-level nursing students. May be primarily engaged in teaching or do a combination of teaching and research. |
| Preschool Teachers, Except Special Education | Educate and care for children, usually ages three to five, who have not yet entered kindergarten. Teach reading, writing, science, and other subjects in a way that young children can understand. |
| Secondary School Teachers, Except Special & Career/Technical Education | Instruct students in one or more subjects, such as English, mathematics, or social studies at the high school level in public or private schools. |
| Self-Enrichment Education Teachers | Teach courses other than those that lead to an occupational credential. Courses may include self-improvement, non-vocational, and nonacademic subjects. Teaching may or may not take place in a traditional educational institution. |
| Special Education Teachers, Kindergarten & Elementary School | Work with elementary students who have a wide range of learning, mental, emotional, and physical disabilities. Adapt general education lessons and teach school subjects and basic skills like communication. |
| Teacher Assistants | Work under a teacher's supervision to give students additional attention and instruction. |
| Vocational Education Professors | Teach vocational or occupational subjects at the college level (but at less than the baccalaureate) to students who have graduated or left high school. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|---|------------------|----------------------------|--------------------------------|-----------------------------------|-----------------|
| Teaching/Training | ★★★★★ | ★★★ | \$32,830 / \$42,870 | Bachelor's degree | SAE |
| Teaching/Training | ★★ | ★★★★★★ | \$48,750 / \$69,340 | Doctoral or professional degree | SIR |
| Teaching/Training | ★★★★★★ | ★★★★ | \$19,600 / \$31,220 | Bachelor's degree | SRE |
| Teaching/Training | ★★★ | ★★★★★★ | \$42,720 / \$55,850 | Doctoral or professional degree | SI |
| Administration & Administrative Support | ★★★★★ | ★★★ | \$50,330 / \$63,450 | Master's degree | ESC |
| Administration & Administrative Support | ★★★ | ★★★ | \$31,100 / \$47,000 | Bachelor's degree | SEC |
| Professional Support Services | ★★★★★★ | ★★★ | \$37,320 / \$47,370 | Master's degree | S |
| Teaching/Training | ★★★★★★ | ★★ | \$34,460 / \$43,110 | Bachelor's degree | SAC |
| Teaching/Training | ★★★★★★ | ★★★★★★ | \$44,520 / \$103,630 | Doctoral or professional degree | SI |
| Professional Support Services | ★★★★★ | ★★★ | \$39,330 / \$56,150 | Master's degree | SIE |
| Professional Support Services | ★★★★★ | ★★★ | \$23,240 / \$31,280 | Postsecondary nondegree award | CSE |
| Teaching/Training | ★★★★★★ | ★★ | \$34,910 / \$43,020 | Bachelor's degree | SA |
| Teaching/Training | ★★★ | ★★★★★★ | \$49,350 / \$62,490 | Master's degree | SI |
| Teaching/Training | ★★★★★★ | ★★★★ | \$20,050 / \$26,230 | Associate's degree | SA |
| Teaching/Training | ★★★★★★ | ★★ | \$34,850 / \$44,010 | Bachelor's degree | SAE |
| Teaching/Training | ★★★★★★ | ★★★★★★ | \$19,430 / \$30,450 | High school diploma or equivalent | SAE |
| Teaching/Training | ★★★★★★ | ★★ | \$34,920 / \$43,170 | Bachelor's degree | SA |
| Teaching/Training | ★★★★★★ | ★★★ | \$19,460 / \$22,680 | Some college, no degree | SC |
| Teaching/Training | ★★★★★★ | ★★★ | \$37,790 / \$50,760 | Bachelor's degree | SR |



Career Story



Aaliyah Carson

Isothermal Community College
A.A.S., Early Childhood Education

“It is so rewarding to be able to see the children learn and grow.”

“I love it,” she says. “It is so rewarding to be able to see the children learn and grow. Isothermal helped me so much by helping me prepare for my job. My instructors have helped me mature and develop the patience needed to succeed in this field.”

Aaliyah Carson loves children. Thanks to her degree in Early Childhood Education from Isothermal Community College, she's turned her passion into a meaningful career.

Aaliyah works for Rutherford County Schools as a teacher assistant in the Pre-K program.



Tell Me About...

TEACHER ASSISTANTS

Teacher assistants work under a teacher's supervision to give students additional attention and instruction. They typically do the following:

- Review material with individual students or in small groups to reinforce teachers' lessons
- Enforce school and class rules to help teach students proper behavior
- Help teachers with recordkeeping such as tracking attendance and calculating grades
- Help teachers prepare for lessons by getting materials ready or setting up equipment such as computers
- Help supervise students in class, between classes, during lunch and recess, and on field trips
- Discuss assigned duties with classroom teachers to coordinate instructional efforts
- Under teachers' direction and guidance, present subject matter to students using lectures, discussions, or supervised role-playing methods
- Use computers, audio-visual aids, and other equipment and materials to supplement presentations

For more information about this career and 560 other occupations:
nccareers.org/occupationalprofiles/index.html





Finance

Money is an essential element in each of our lives. We entrust our financial well-being to people who safeguard bank accounts, provide loans, insure cars and homes, and help us make wise investments. Their math skills must be strong, and they must be precise, paying close attention to detail and keeping accurate records. Workers also need good communication skills so that they can respond to questions and clearly explain information. They must be service-oriented and sometimes work with people who are under stress about their finances.

Finance jobs exist in settings that range from banks to tax return centers to private offices. Most large organizations like hospitals have finance employees. While financial specialists usually have an 8-to-5 schedule, some workers' schedules must accommodate their clients' after-work hours. Tax preparers have intense work times from the beginning of January until April 15.

In North Carolina, most finance occupations require a high school education or a bachelor's degree. Occupations within this cluster with the greatest predicted growth include personal financial advisors, loan interviewers and clerks, and loan officers. The finance and insurance industry has one of the highest average weekly wages when compared with other industries. Likely places to find jobs include banks, corporate management offices, insurance agencies, insurance underwriting companies, and offices of certified public accountants.

CAREER RESEARCH

- National Association of Business Economics nabe.com
- American Bankers Association aba.com/Pages/default.aspx
- National Coordinating Council for Career and Technical Student Organizations ctsos.org
- Future Business Leaders of America/Phi Beta Lambda fbla-pbl.org
- DECA deca.org
- Insurance Education for Future Leaders investprogram.org
- National Association of Personal Finance Advisors napfa.org
- CFA Institute cfainstitute.org/pages/index.aspx

Find more Finance occupations at onetonline.org/find/career?c=6



Core Skills

- Management of Financial Resources
- Mathematics
- Negotiation
- Persuasion
- Active Listening
- Judgment and Decision Making
- Programming
- Writing
- Reading Comprehension
- Speaking



ACCOUNTING PATHWAY

OCCUP.

- Business & Financial Operations
Accountants and Auditors; Accountants; Auditors



BANKING SERVICES PATHWAY

OCCUP.

- **Business & Financial Operations**
Credit Analysts; Loan Officers
- **Office & Administrative Support**
Bill and Account Collectors; Tellers; Credit Authorizers, Checkers, and Clerks; Credit Authorizers; Credit Checkers; Loan Interviewers and Clerks

BUSINESS FINANCE PATHWAY

OCCUP.

- **Business & Financial Operations**
Budget Analysts; Financial Analysts; Tax Preparers
- **Management**
Financial Managers; Treasurers and Controllers; Financial Managers, Branch or Department

INSURANCE PATHWAY

OCCUPATION

- **Business & Financial Operations**
Claims Adjusters, Examiners, and Investigators; Claims Examiners, Property and Casualty Insurance; Insurance Adjusters, Examiners, and Investigators; Insurance Appraisers, Auto Damage; Insurance Underwriters
- **Computer & Mathematical**
Actuaries
- **Office & Administrative Support**
Insurance Claims and Policy Processing Clerks; Insurance Claims Clerks; Insurance Policy Processing Clerks
- **Sales & Sales Related**
Insurance Sales Agents

SECURITIES & INVESTMENTS PATHWAY

OCCUP.

- **Business & Financial Operations**
Personal Financial Advisors; Financial Quantitative Analysts; Risk Management Specialists; Investment Underwriters; Fraud Examiners, Investigators and Analysts
- **Office & Administrative Support**
Brokerage Clerks
- **Sales & Sales Related**
Securities, Commodities, and Financial Services Sales Agents; Sales Agents, Securities and Commodities; Sales Agents, Financial Services; Securities and Commodities Traders





Selected Careers

| Occupation* | Job Description |
|--|--|
| Accountants & Auditors | Prepare and examine financial records. Ensure that taxes are paid properly and on time. Assess financial operations and work to help ensure that organizations run efficiently. |
| Bill & Account Collectors | Try to recover payment on overdue bills. Negotiate repayment plans with debtors and help them find solutions to make paying their overdue bills easier. |
| Brokerage Clerks | Provide services related to purchasing, selling, or holding of stocks and bonds. Write orders for stock purchases or sales, compute transfer taxes, track stock price changes, and keep records. |
| Budget Analysts | Help public and private institutions organize their finances. Prepare budget reports and monitor institutional spending. |
| Claims Adjusters, Examiners, & Investigators | Evaluate insurance claims. Decide whether an insurance company must pay a claim, and if so, how much. |
| Credit Analysts | Evaluate credit data and financial statements of individuals or firms to determine level of risk involved in extending credit or lending money. Prepare credit reports for use in decision making. |
| Credit Authorizers, Checkers, & Clerks | Authorize credit charges against customers' accounts or investigate the history and credit standing of individuals or business establishments applying for credit. |
| Financial Analysts | Provide guidance to businesses and individuals making investment decisions. Assess performance of stocks, bonds, and other types of investments. |
| Financial Managers | Responsible for the financial health of an organization. Produce financial reports, direct investment activities, and develop strategies and plans for the organization's long-term financial goals. |
| Insurance Claims & Policy Processing Clerks | Handle new insurance policies, changes to existing policies, and claims forms. Obtain information from customers to make sure that claims and application forms are accurate and complete. |
| Insurance Sales Agents | Help insurance companies get new business by contacting potential customers and selling one or more types of insurance. Explain various insurance policies and help clients choose plans that suit them. |
| Insurance Underwriters | Review individual applications for insurance to evaluate degree of risk involved and determine whether to accept applications. |
| Loan Interviewers & Clerks | Interview people to collect and verify personal and financial information needed for loan applications. Prepare documents that go to the appraiser and are issued at the closing of a loan. |
| Loan Officers | Evaluate, authorize, or recommend approval of loan applications for people and businesses. |
| Personal Financial Advisors | Give financial advice to people. Help with investments, taxes, and insurance decisions. |
| Securities, Commodities, & Financial Services Sales Agents | Connect buyers and sellers in financial markets. Sell securities to individuals, advise companies in search of investors, and conduct trades. |
| Tax Preparers | Prepare tax returns for individuals or small businesses. |
| Tellers | Accurately process routine transactions at a bank, including cashing checks, depositing money, and collecting loan payments. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--------------------------|------------------|----------------------------|--------------------------------|--|-----------------|
| Accounting | ★★★★★ | ★★★★★ | \$48,960 / \$66,530 | Bachelor's degree | CE |
| Banking Services | ★★★★★ | ★ | \$25,560 / \$34,490 | High school diploma, moderate-term on-the-job training | CE |
| Securities & Investments | ★★★ | ★★★★★ | \$29,930 / \$45,250 | High school diploma, moderate-term on-the-job training | CE |
| Business Finance | ★★ | ★★★ | \$51,150 / \$67,360 | Bachelor's degree | CEI |
| Insurance | ★★★★★ | ★★★ | \$42,260 / \$61,390 | High school diploma, long-term on-the-job training | CE |
| Banking Services | ★★★★★ | ★★★★★ | \$49,090 / \$78,490 | Bachelor's degree | CE |
| Banking Services | ★★ | ★ | \$25,100 / \$38,530 | High school diploma, moderate-term on-the-job training | CE |
| Business Finance | ★★★★★ | ★★★★★ | \$53,260 / \$76,860 | Bachelor's degree | CIE |
| Business Finance | ★★★★★ | ★★★★★ | \$84,910 / \$125,810 | Bachelor's degree | EC |
| Insurance | ★★★★★ | ★★★ | \$31,420 / \$40,290 | High school diploma, moderate-term on-the-job training | CE |
| Insurance | ★★★★★ | ★★★★★ | \$30,320 / \$49,030 | High school diploma, moderate-term on-the-job training | ECS |
| Insurance | ★★★ | ★ | \$47,130 / \$74,110 | Bachelor's degree | CEI |
| Banking Services | ★★★★★ | ★★★★★ | \$30,440 / \$38,800 | High school diploma, short-term on-the-job training | CE |
| Banking Services | ★★★★★ | ★★★★★ | \$35,890 / \$62,740 | Bachelor's degree | CES |
| Securities & Investments | ★★★★★ | ★★★★★ | \$49,710 / \$82,090 | Bachelor's degree | ECS |
| Securities & Investments | ★★★★★ | ★★★★★ | \$34,850 / \$69,890 | Bachelor's degree | EC |
| Business Finance | ★★★★★ | ★★ | \$19,570 / \$29,620 | High school diploma, moderate-term on-the-job training | CE |
| Banking Services | ★★★★★ | ★★ | \$23,760 / \$28,780 | High school diploma, short-term on-the-job training | CE |



Career Story



James Tobin

Forsyth Technical Community College
Accounting Program

James Tobin works at Dixon Hughes Goodman, an accounting firm in High Point. Before beginning the accounting program at Forsyth Tech Community College, James was working at a dead-end job that had absolutely no future. He knew that if he wanted to be happy, he needed to make a career change.

"The opportunity for recent graduates at the office in High Point simply does not exist anywhere else."

James went back to school at Forsyth Tech and took a career aptitude test, which suggested a career in finance or accounting. He decided to start with just taking one accounting course at night to see how he liked it. "The course was challenging, but I still liked it, and decided to continue and finish the accounting program."

Recruiters from Dixon Hughes Goodman came to speak to one of the classes at Forsyth Tech. They were starting a brand new experimental program at their office in High Point, specifically designed for students and recent college graduates to work and gain experience doing entry-level work that is sent in from offices all over the country. James applied for one of the open positions and was hired.

"I could not have imagined a more perfect opportunity. The opportunity for recent graduates at the office in High Point simply does not exist anywhere else, and it is only a short drive from my house. I felt like I had won the lottery."

Without a doubt, deciding to further his education at Forsyth Tech was the best decision James ever made. James is still working on his associate degree in accounting, yet he feels that he is doing the same job as those with a bachelor's degree or higher at other accounting firms.

Future plans include a bachelor's and possibly a master's degree in accounting at some point. For now, there is absolutely no limit to how far James can go in this field.



Did You Know...

Your location affects how much money you need to earn.

The amount of income you need depends to a certain extent on where you live. People living in different counties are likely to have different costs for many of the same things. Your decisions about how much you are willing to spend on expenses like housing, clothing, meals, and utilities also have an impact on how much you need to earn.

To make choices about the costs of your preferred way of life, to compare costs for the same items in different counties, and to find occupations that are likely to support your lifestyle, go to Reality Check at nccareers.org/realitycheck/landing/index.html.





Government & Public Administration

Government ensures that citizens receive vital services that may not otherwise be available to them. Government employees provide regulatory oversight and support for transportation, public safety, healthcare, education, utilities, and courts. In North Carolina, most government employees work for state or local governments. Some people also work for the federal government. Occupations in government mirror careers found in almost every industry. They range from many business, management, and administrative occupations to jobs related to construction and transportation.

Public work sector jobs typically require the same educational requirements as private sector occupations. Government employees' work schedules and environments depend on workers' specific jobs and — at times — on the size and level of government. This cluster includes desk jobs with regular eight-hour workdays as well as outdoor work with varying schedules. While hiring practices for most government workers are like those in other sectors, some public sector employees are elected or appointed to their jobs.

CAREER RESEARCH

- Federal Jobs Network federaljobs.net/student.htm
- American Planning Association planning.org/join/students
- National Coordinating Council for Career and Technical Student Organizations ctsos.org
- Junior Achievement jamyway.org/student-center
- North Carolina State Government Jobs nc.gov/jobs
- International City/County Management Association icma.org

Find more Government & Public Administration occupations at onetonline.org/find/career?c=7

Some careers require licenses.



Most of us are used to thinking about driver's licenses and marriage licenses, but did you know that the government requires licensure for some occupations too? If you're wondering about which careers in North Carolina require a license, certification, or registration, visit NCCareers.org's Occupations Requiring Licenses in North Carolina at nccareers.org/occllicenses.



Did You Know...



Core Skills

- Programming
- Writing
- Reading Comprehension
- Speaking
- Mathematics
- Systems Analysis
- Negotiation
- Critical Thinking
- Active Listening
- Judgment and Decision Making



GOVERNANCE PATHWAY

OCCUPATION

- **Business & Financial Operations**
Compliance Officers; Environmental Compliance Inspectors; Licensing Examiners and Inspectors; Equal Opportunity Representatives and Officers; Government Property Inspectors and Investigators; Coroners; Regulatory Affairs Specialists; Financial Examiners
- **Transportation & Material Moving**
Transportation Inspectors; Aviation Inspectors; Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation; Freight and Cargo Inspectors
- **Management**
Legislators



PLANNING PATHWAY

- OCCUP.** • Life, Physical, & Social Science
Urban & Regional Planners
- Office & Administrative Support
Statistical Assistants; Bioinformatics Technicians

PUBLIC MANAGEMENT & ADMINISTRATION PATHWAY

- OCCUP.** • Management
Postmasters and Mail Superintendents; Emergency Management Directors
- Office & Administrative Support
Court, Municipal, and License Clerks; Court Clerks; Municipal Clerks; License Clerks; Eligibility Interviewers, Government Programs

REGULATION PATHWAY

- OCCUP.** • Healthcare Practitioners & Technical
Occupational Health and Safety Specialists; Occupational Health and Safety Technicians
- Farming, Fishing, & Forestry
Agricultural Inspectors
- Construction & Extraction
Construction & Building Inspectors

NATIONAL SECURITY PATHWAY

- OCCUPATION** • Military Specific
Air Crew Officers; Aircraft Launch and Recovery Officers; Armored Assault Vehicle Officers; Artillery and Missile Officers; Command and Control Center Officers; Infantry Officers; Special Forces Officers; First-Line Supervisors of Air Crew Members; First-Line Supervisors of Weapons Specialists/Crew Members; First-Line Supervisors of All Other Tactical Operations Specialists; Air Crew Members; Aircraft Launch and Recovery Specialists; Armored Assault Vehicle Crew Members; Artillery and Missile Crew Members; Command and Control Center Specialists; Infantry; Radar and Sonar Technicians; Special Forces
- Protected Services
Transportation Security Screeners

REVENUE & TAXATION PATHWAY

- OCCUP.** • Business & Financial Operations
Appraisers and Assessors of Real Estate; Assessors; Appraisers, Real Estate; Tax Examiners and Collectors, and Revenue Agents





Selected Careers

| Occupation* | Job Description |
|---|--|
| Agricultural Inspectors | Inspect agricultural products, processing equipment and facilities, and fish and logging operations to make sure they comply with regulations and laws related to health, quality, and safety. |
| Appraisers & Assessors of Real Estate | Estimate the value of land and the buildings on the land usually before it is sold, mortgaged, taxed, insured, or developed. |
| Compliance Officers | Work in a variety of settings to make sure that laws, contracts, regulations, and policies are followed. |
| Construction & Building Inspectors | Make sure that construction meets local and national building codes and ordinances, zoning regulations, and contract specifications. |
| Court, Municipal, & License Clerks | Perform clerical duties for courts of law, municipalities, or governmental licensing agencies and bureaus. Duties depend in part on the function of the governmental organization where they work. |
| Eligibility Interviewers, Government Programs | Decide whether people who apply to receive government assistance like welfare, unemployment benefits, and social security are eligible for that assistance. |
| Financial Examiners | Make sure that financial institutions and transactions meet legal requirements. Review balance sheets, evaluate the risk level of loans, and assess bank management. |
| Occupational Health & Safety Specialists | Inspect workplaces to make sure that businesses follow regulations on safety, health, and the environment. Design programs to prevent disease or injury to workers and damage to the environment. |
| Postmasters & Mail Superintendents | Plan, direct, or coordinate operational, administrative, management, and supportive services of a U.S. post office. May coordinate postal and related workers' activities in assigned post office. |
| Tax Examiners & Collectors, & Revenue Agents | Determine tax liability or collect taxes from individuals or business firms according to prescribed laws and regulations. |
| Urban & Regional Planners | Develop comprehensive plans and programs for use of land and physical facilities of jurisdictions such as towns, cities, counties, and metropolitan areas. |


The military is part of the Government career cluster.



Did You Know...



8
Military bases in NC



91,175 U.S. active duty military personnel in N.C.



380+
Civilian occupations that match military job titles

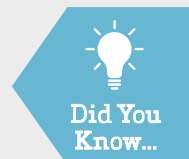
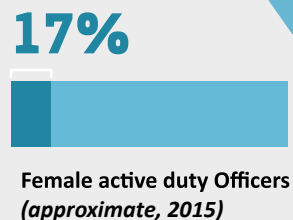
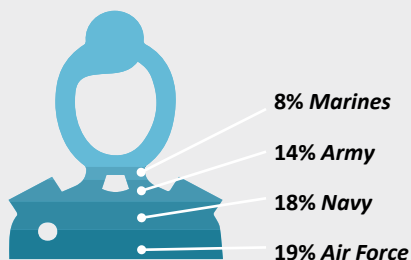
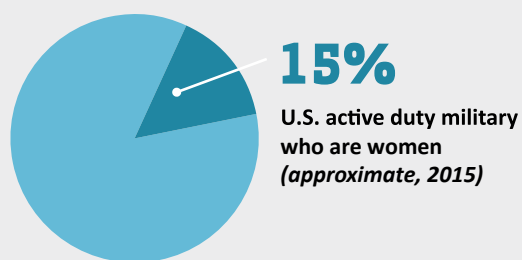
Sources: militarybases.com/north-carolina;
 Counts of Active Duty and Reserve Service Members and APF Civilians, September 2017 dmcd.osd.mil/appj/dwp/dwp_reports.jsp;



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/Median Wages* | Minimum Education* | Interest Areas* |
|------------------------------------|------------------|----------------------------|----------------------------|--|-----------------|
| Regulation | ★★ | ★ | \$29,790 / \$41,360 | Bachelor's degree | RCI |
| Revenue & Taxation | ★★★★ | ★★★★★ | \$32,120 / \$49,090 | Bachelor's degree | EC |
| Governance | ★★★★★ | ★★★★ | \$41,240 / \$63,700 | Bachelor's degree | CE |
| Regulation | ★★★★★ | ★★★★★ | \$36,820 / \$51,440 | High school diploma, moderate-term on-the-job training | RCI |
| Public Management & Administration | ★★★★★ | ★★ | \$22,100 / \$31,900 | High school diploma, moderate-term on-the-job training | CE |
| Public Management & Administration | ★★★★★ | ★★ | \$30,060 / \$36,510 | High school diploma, moderate-term on-the-job training | SCE |
| Governance | ★★★★ | ★★★★★★ | \$53,100 / \$79,710 | Bachelor's degree | EC |
| Regulation | ★★★★ | ★★★★ | \$46,370 / \$66,650 | Bachelor's degree | IC |
| Public Management & Administration | ★★ | ★ | \$58,410 / \$73,390 | High school diploma, moderate-term on-the-job training | ECS |
| Revenue & Taxation | ★★★★ | ★ | \$35,990 / \$49,200 | Bachelor's degree | CE |
| Planning | ★★★★ | ★★★★ | \$47,060 / \$61,820 | Master's degree | IEA |

Women are changing the demographics of our military.



Sources: onetcenter.org/dl_files/2010/military_crosswalk.zip

Pew Research Fact Tank, pewresearch.org/fact-tank/2017/04/13/6-facts-about-the-u-s-military-and-its-changing-demographics APRIL 13, 2017.



Career Story



Marcus Abernethy

Caldwell County Community College
Associate of Arts

Marcus Abernethy is the City Manager of Hamlet, N.C., a small city near Rockingham. His path toward this career began while in middle school. In seventh grade, Marcus Abernethy was inducted into Caldwell Community College and Technical Institute's TRIO/Educational Talent Search program.

"I knew by the time I left high school that I wanted to pursue a career in public service."

The TRIO program helped him discover what it takes to be a leader and to discover his own passion for public service. "TRIO instilled in me a strong desire to lead others," said Abernethy. "I knew by the time I left high school that I wanted to pursue a career in public service."

While at CCC&TI, Abernethy further developed his leadership skills with a variety of student activities. He continued his involvement with TRIO in the Student Support Services program for college students. Abernethy served as both a senator and vice-president for CCC&TI's Student Government Association, served as a CCC&TI Student Ambassador, and attended the NC Community College System Student Leadership Institute, a yearlong program that selects only a few students from across the state for participation.

Abernethy earned his Associate in Arts degree in 2010 and transferred to Appalachian State University where he earned his Bachelor of Science Degree in Political Science and his Master of Arts degree in Public Administration.

Abernethy indicates that his success is due, in part, to his hard work and the support he received through CCC&TI's TRIO program, but also to those who have helped him along the way.



CHIEF EXECUTIVES

Chief executives develop strategies and policies to make sure that an organization meets its goals. They plan, direct, and coordinate the operations of companies and organizations.

Chief executives work in many industries, but their working environments tend to be similar. They usually work indoors in comfortable offices but may frequently travel to attend meetings or visit their company's offices. Their workdays include many face-to-face, email, and telephone communications. Chief executives' work is often stressful because they are under intense pressure to succeed. They have a lot of freedom to make decisions, but their daily decisions have a large impact on their employees and business. Executives in charge of poorly performing organizations may find their jobs in jeopardy. Chief executives often work long hours, including evenings and weekends, usually for more than 40 hours per week.

For more information about this career and 560 other occupations:
nccareers.org/occupationalprofiles/index.html





Health Science

Where do medical technologies and human touch intersect? They meet within the Health Science career cluster, which is a North Carolina and national growth industry. As the number of Americans over age 65 has grown and as more people survive serious injuries and other health issues, the need for healthcare has increased. If you want to work in a cluster that has strong job growth, this cluster may be for you. It is expected to include the greatest number of new jobs in North Carolina over the next 10 years and about one-third of the state's "hot jobs."

Hospitals or doctors' offices usually come to mind first when we think about healthcare workplaces, but home health care organizations and nursing homes also employ workers in this cluster. Some employees in this industry have 8-to-5 schedules, while others work less traditional shifts.

If you're thinking about a healthcare career, many jobs require good math and science skills. Jobs in this industry include a wide variety of educational backgrounds, ranging from medical degrees to many jobs that require less than four years of college.

CAREER RESEARCH

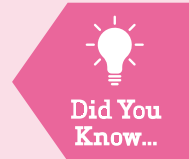
- Council on Education for Public Health ceph.org
- Academy of Nutrition and Dietetics eatright.org
- Johnson & Johnson/Discovering Nursing discovernursing.com
- Association of University Programs in Health Administration aupha.org/resourcecenter/futurestudents
- HOSA – Future Health Professionals hosa.org

Find more Health Science occupations at onetonline.org/find/career?c=8

An industry can employ people in a variety of occupations.

For instance, maybe you'd like to work in a hospital but have no desire to be a nurse.

| INDUSTRY: HOSPITALS | EMPLOYMENT | % OCCUPATION EMPLOYMENT | MEDIAN ANNUAL WAGE |
|---|------------|-------------------------|--------------------|
| Maids & Housekeeping Cleaners | 4,680 | 2.4% | \$22,450 |
| Interviewers, Except Eligibility & Loan | 4,504 | 2.3% | \$29,970 |
| Radiologic Technologists | 4,324 | 2.2% | \$57,230 |



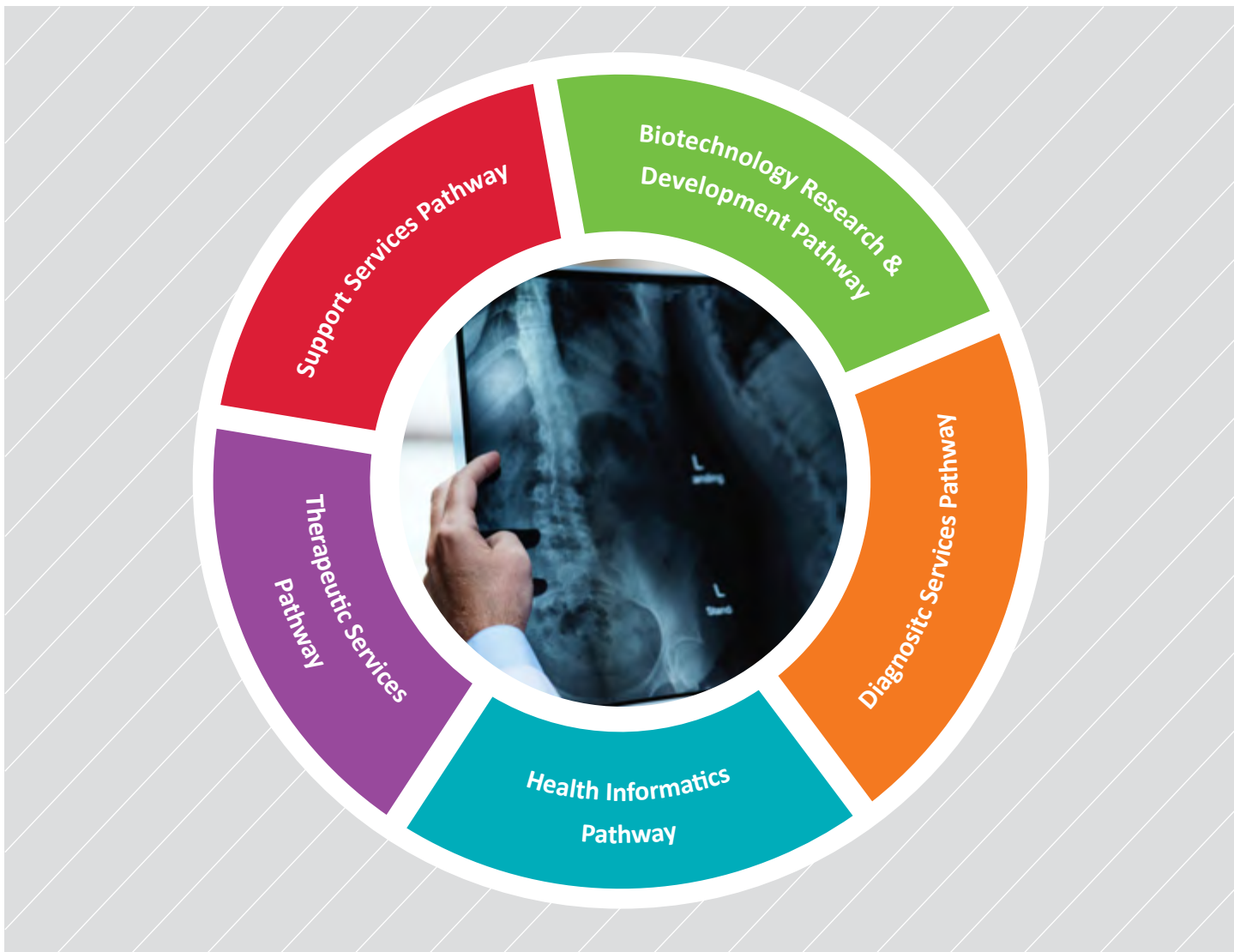
For more information about industry employment: nccareers.org/staffingpatterns/staffing_patterns.html





Core Skills

- Science
- Service Orientation
- Social Perceptiveness
- Instructing
- Learning Strategies
- Reading Comprehension
- Active Learning
- Active Listening
- Writing
- Judgment and Decision Making



BIOTECHNOLOGY RESEARCH & DEVELOPMENT PATHWAY

OCCUP.

- Architecture & Engineering
Biomedical Engineers
- Life, Physical, & Social Science
Medical Scientists, Except Epidemiologists



DIAGNOSTIC SERVICES PATHWAY

OCCUPATION

- **Healthcare Practitioners & Technical**
Medical and Clinical Laboratory Technologists; Cytogenetic Technologists; Cytotechnologists; Histotechnologists and Histologic Technicians; Medical and Clinical Laboratory Technicians; Cardiovascular Technologists and Technicians; Diagnostic Medical Sonographers; Nuclear Medicine Technologists; Radiologic

Technologists; Magnetic Resonance Imaging Technologists; Veterinary Technologists and Technicians; Neurodiagnostic Technologist; Ophthalmic Medical Technologists; Radiologic Technicians; Surgical Assistants

- **Life, Physical, & Social Science**
Epidemiologists

HEALTH INFORMATICS PATHWAY

OCCUP.

- **Healthcare Practitioners & Technical**
Medical Records and Health Information Technicians
- **Healthcare Support**
Medical Transcriptionists

- **Office & Administrative Support**
Medical Secretaries

THERAPEUTIC SERVICES PATHWAY

OCCUPATION

- **Healthcare Practitioners & Technical**
Chiropractors; Dentists, General; Oral and Maxillofacial Surgeons; Orthodontists; Prosthodontists; Dietitians and Nutritionists; Optometrists; Pharmacists; Anesthesiologists; Family and General Practitioners; Internists, General; Obstetricians and Gynecologists; Pediatricians, General; Psychiatrists; Surgeons; Allergists and Immunologists; Dermatologists; Hospitalists; Neurologists; Nuclear Medicine Physicians; Ophthalmologists; Pathologists; Physical Medicine and Rehabilitation Physicians; Preventive Medicine Physicians; Radiologists; Sports Medicine Physicians; Urologists; Physician Assistants; Anesthesiologist Assistants; Podiatrists; Occupational Therapists; Low Vision Therapists, Orientation and Mobility Specialists, and Vision Rehabilitation Therapists; Physical Therapists; Radiation Therapists; Recreational Therapists; Art Therapists; Music Therapists; Respiratory Therapists; Speech-Language Pathologists; Exercise Physiologists; Veterinarians; Registered Nurses; Acute Care Nurses; Advanced Practice Psychiatric Nurses; Critical Care Nurses; Clinical Nurse Specialists; Nurse Anesthetists; Nurse Midwives; Nurse Practitioners; Audiologists; Acupuncturists; Naturopathic Physicians; Orthoptists; Dental Hygienists; Dietetic Technicians; Pharmacy Technicians; Psychiatric Technicians; Respiratory Therapy Technicians; Surgical Technologists; Ophthalmic Medical Technicians; Licensed Practical and Licensed Vocational Nurses; Opticians, Dispensing; Orthotists and Prosthetists; Hearing Aid Specialists; Athletic Trainers; Genetic Counselors; Midwives

- **Healthcare Support**
Home Health Aides; Psychiatric Aides; Nursing Assistants; Occupational Therapy Assistants; Occupational Therapy Aides; Physical Therapist Assistants; Physical Therapist Aides; Dental Assistants; Medical Assistants

SUPPORT SERVICES PATHWAY

OCCUP.

- **Healthcare Support**
Orderlies; Medical Equipment Preparers; Pharmacy Aides; Veterinary Assistants and Laboratory Animal Caretakers; Phlebotomists; Speech-Language Pathology Assistants; Endoscopy Technicians

- **Management**
Medical and Health Services Managers



Selected Careers

| Occupation* | Job Description |
|---|--|
| Cardiovascular Technologists & Technicians | Operate specialized equipment to conduct tests that help doctors analyze and diagnose heart and lung conditions. May assist physicians and surgeons during surgical procedures. |
| Dental Hygienists | Clean teeth, examine patients for signs of oral diseases such as gingivitis, and provide other preventative dental care. Educate patients on ways to improve and maintain good oral health. |
| Diagnostic Medical Sonographers | Operate special imaging equipment to create images or conduct tests that help physicians assess and diagnose medical conditions. |
| Dietitians & Nutritionists | Experts in food and nutrition who advise people about what to eat to lead a healthy lifestyle or achieve a specific health-related goal. |
| Licensed Practical & Licensed Vocational Nurses | Provide basic medical care, working under the direction of registered nurses and doctors. |
| Magnetic Resonance Imaging Technologists | Operate MRI scanners, monitor patient safety and comfort, and view images to ensure quality of pictures. May also explain MRI procedures. |
| Medical & Clinical Laboratory Technicians | Perform routine medical laboratory tests to diagnose, treat, and prevent disease. May work under the supervision of a medical technologist. |
| Medical & Clinical Laboratory Technologists | Perform complex medical laboratory tests for diagnosing, treating, and preventing disease. May also train or supervise staff. |
| Medical & Health Services Managers | Plan, direct and coordinate medical and healthcare services and facilities. May manage large physician group practices or specialize in clinical areas or departments. |
| Medical Scientists, Except Epidemiologists | Conduct research aimed at improving overall human health. Often use clinical trials and other investigative methods to reach their findings. |
| Nurse Anesthetists | RNs who complete specialized graduate education that qualifies them to administer anesthesia, monitor patient's vital signs, and oversee patient recovery from anesthesia. |
| Nurse Practitioners | Coordinate patient care and may provide primary and specialty health care. The scope of practice varies from state to state. |
| Occupational Therapy Assistants | Help patients develop, recover, and improve the skills needed for daily living and working. Provide patient therapy, working under the direction of occupational therapists. |
| Pharmacists | Dispense prescription medicines and provide customers with information about using prescriptions safely. May give advice on leading a healthy lifestyle, conduct health and wellness screenings, and provide immunizations. |
| Physical Therapist Assistants | Help physical therapists provide physical therapy treatments and procedures. May also assist in developing treatment plans, tracking progress, and modifying specific treatments based on patients' progress and PT's treatment plans. |
| Physical Therapists | Help injured or ill people improve their movement and manage their pain, serving an important role in rehabilitating and treating patients with chronic conditions or injuries. |
| Physician Assistants | Practice medicine under the supervision of physicians and surgeons. |
| Registered Nurses | Provide and coordinate patient care, educate patients and the public about various health conditions, and provide advice and emotional support to patients and their family members. |
| Respiratory Therapists | Care for patients who have trouble breathing due to chronic respiratory diseases like COPD. Work with patients of all ages and provide emergency care to patients suffering from heart attacks, drowning, or shock. |
| Speech-Language Pathologists | Assess, diagnose, treat, and help prevent patients' communication and swallowing disorders that may result from stroke, brain injury, hearing loss, developmental delay, cleft palate, cerebral palsy, or emotional problems. |
| Surgeons | Treat diseases, injuries, and deformities using surgical methods. Procedures range from invasive to minimally-invasive to non-invasive surgical methods. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|---|------------------|----------------------------|--------------------------------|------------------------------------|-----------------|
| Diagnostic Services | ★★★ | ★★★★★ | \$49,570 / \$62,490 | Associate's degree | RIS |
| Therapeutic Services | ★★★★ | ★★★★ | \$54,060 / \$68,760 | Associate's degree | SRC |
| Diagnostic Services | ★★★ | ★★★★★ | \$52,020 / \$63,860 | Associate's degree | ISR |
| Therapeutic Services | ★★★ | ★★★★★ | \$38,190 / \$51,550 | Bachelor's degree | IS |
| Therapeutic Services | ★★★★★ | ★★★★★ | \$34,700 / \$42,740 | Postsecondary nondegree award | SR |
| Diagnostic Services | ★★★ | ★★★★ | \$54,020 / \$66,160 | Associate's degree | RCS |
| Diagnostic Services | ★★★★ | ★★★★★ | \$30,620 / \$38,550 | Associate's degree | RIC |
| Diagnostic Services | ★★★★ | ★★★★★ | \$45,920 / \$58,090 | Bachelor's degree | IRC |
| Support Services | ★★★★★ | ★★★★★ | \$74,270 / \$98,520 | Bachelor's degree | ECS |
| Biotechnology Research & Development | ★★★★ | ★★★★ | \$58,060 / \$90,450 | Doctoral or professional degree | IRA |
| Therapeutic Services | ★★★★ | ★★★★★ | \$124,490 / \$154,540 | Master's degree | IRS |
| Therapeutic Services | ★★★★ | ★★★★★ | \$82,040 / \$97,690 | Master's degree | SIR |
| Therapeutic Services | ★★★ | ★★★★★ | \$46,640 / \$62,150 | Associate's degree | SR |
| Therapeutic Services | ★★★★ | ★★★★ | \$98,550 / \$123,470 | Doctoral or professional degree | ICS |
| Therapeutic Services | ★★★★ | ★★★★★ | \$45,710 / \$59,050 | Associate's degree | SRI |
| Therapeutic Services | ★★★★ | ★★★★★ | \$64,490 / \$81,050 | Doctoral or professional degree | SIR |
| Therapeutic Services | ★★★★ | ★★★★★ | \$81,240 / \$98,670 | Master's degree | SIR |
| Therapeutic Services | ★★★★★ | ★★★★★ | \$47,350 / \$59,590 | Bachelor's degree | SIC |
| Therapeutic Services | ★★★★ | ★★★★★ | \$44,470 / \$54,410 | Associate's degree | SIR |
| Therapeutic Services | ★★★★ | ★★★★★ | \$49,760 / \$68,460 | Master's degree | SIA |
| Therapeutic Services | ★★★ | ★★★★★ | \$197,070 / \$208,000+ ‡ | Doctoral or professional degree | IRS |

‡ US Data



Career Stories



Angela Coleman-Talbot

Wake Technical Community College
A.A.S., Nursing

A childhood dream of becoming a nurse eventually led to the Nursing program at Wake Technical Community College, and from there to a career as a registered nurse at Cone Health.

Upon graduating from Wake Tech, Angela was immediately offered placement at Cone Health.

Angela Coleman-Talbot felt nothing but love and respect for Wake Tech for the excellent education and supportive services that she received. The college recognized her hard work in the Nursing program by awarding her the Dwight O. Ryan Student Achievement Award for excellence in Health Sciences. This honor recognizes the most outstanding student in each division based on achievement, attitude, motivation, participation, contributions to the program, and involvement in student organizations.

Upon graduating from Wake Tech, Coleman-Talbot was offered placement at Cone Health in their coveted Residency of Emergency Nursing new graduate program. This program has allowed her to expand her nursing knowledge and skills

through core classes in critical care and emergency care, training in advanced cardiac life support, crisis prevention, disaster management, and forensics trauma basis.

Through the Cone Health residency program Coleman-Talbot has worked in a variety of adult and pediatric emergency facilities and has had interactions with critical members of the emergency response team while receiving intense classroom education, training and support.

Coleman-Talbot is grateful for the support of her nursing school family, peers, and faculty, who gave her the knowledge, courage, and confidence needed to be successful in nursing school and beyond. She plans to continue serving her community by being an enthusiastic health advocate who is passionate about patient rights and health literacy.



Tell Me About...

REGISTERED NURSES

Registered nurses (RNs) provide and coordinate patient care, educate patients and the public about various health conditions, and provide advice and emotional support to patients and their family members. They typically do the following:

- Record patients' medical histories and symptoms
- Administer patients' medicines and treatments
- Set up plans for patients' care or contribute to existing plans
- Observe patients and record observations

For more information about this career and 560 other occupations:
nccareers.org/occupationalprofiles/index.html





Hospitality & Tourism

When you pick up takeout food, eat in a restaurant or cafeteria, and enjoy food at catered events, you're helping support the hospitality industry. If you travel and stay in a hotel, bed-and-breakfast, or RV park, the tourism industry benefits. Going to baseball games, casinos, and museums are other activities that contribute to this industry's part of the economy.

As in most clusters, technology has changed how people work and serve customers. Some restaurants provide tablets for customers to use for ordering and paying for meals and for playing games while waiting to be served. Computer systems allow managers to track inventory and to set up worker schedules.

Hospitality and tourism occupations include many entry-level positions. Although some management jobs require postsecondary education, a high school diploma is sufficient for a number of occupations. The work environment for these occupations varies according to job function. Kitchen employees work in hot, noisy surroundings while event planners may spend much of their time in an office. Tourism workers often have schedules that depend on their locations and on special events and seasons. Industries that tend to employ the highest number of hospitality and tourism workers include full-service and fast-food restaurants, hotels and motels, janitorial companies, and public schools.

CAREER RESEARCH

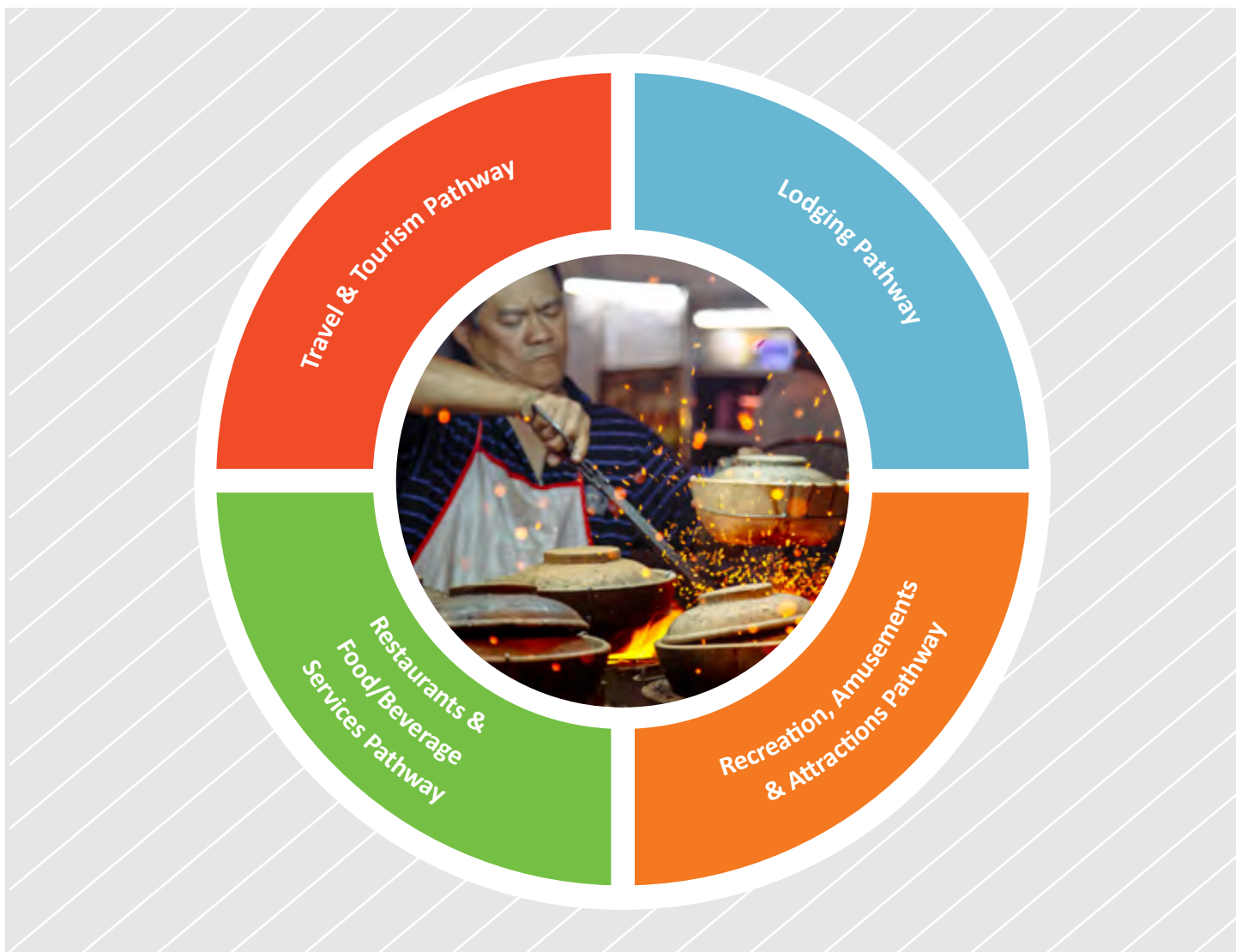
- Destinations International
[destinationsinternational.org](https://www.destinationsinternational.org)
- National Restaurant Association Educational Foundation
[chooserestaurants.org](https://www.chooserestaurants.org)
- North Carolina Restaurant & Lodging Association
[ncrla.org](https://www.ncrla.org)
- IDEA Health & Fitness Association
[ideafit.com/fitness-career](https://www.ideafit.com/fitness-career)
- International Association of Amusement Parks and Attractions
[ialei.org](https://www.ialei.org)
- Family, Career and Community Leaders of America (FCCCLA)
[fcclainc.org](https://www.fcclainc.org)

Find more Hospitality & Tourism occupations at
[onetonline.org/find/career?c=9](https://www.onetonline.org/find/career?c=9)



Core Skills

- Service Orientation
- Management of Financial Resources
- Coordination
- Social Perceptiveness
- Management of Material Resources
- Negotiation
- Persuasion
- Management of Personnel Resources
- Time Management
- Monitoring



LODGING PATHWAY

OCCUPATION

- Management
Lodging Managers
- Building & Grounds Cleaning & Maintenance
First-Line Supervisors of Housekeeping and Janitorial Workers; Janitors and Cleaners, Except Maids and Housekeeping Cleaners; Maids and Housekeeping Cleaners
- Personal Care & Service
Baggage Porters and Bellhops; Concierges
- Office & Administrative Support
Hotel, Motel, and Resort Desk Clerks



RECREATION, AMUSEMENTS, & ATTRACTIONS PATHWAY

OCCUPATION

- **Management**
Gaming Managers
- **Arts, Design, Entertainment, Sports, & Media**
Athletes and Sports Competitors; Umpires, Referees, and Other Sports Officials
- **Sales & Related**
Gaming Change Persons and Booth Cashiers
- **Personal Care & Service**
Gaming Supervisors; Slot Supervisors; Animal Trainers; Gaming Dealers; Gaming and Sports Book Writers and Runners; Motion Picture Projectionists; Ushers, Lobby Attendants, and Ticket Takers; Amusement and Recreation Attendants; Recreation Workers
- **Office & Administrative Support**
Gaming Cage Workers

RESTAURANTS AND FOOD/BEVERAGE SERVICES PATHWAY

OCCUPATION

- **Management**
Food Service Managers
- **Production**
Bakers
- **Personal Care & Service**
Chefs and Head Cooks; First-Line Supervisors of Food Preparation and Serving Workers; Cooks, Fast Food; Cooks, Institution and Cafeteria; Cooks, Private Household; Cooks, Restaurant; Cooks, Short Order; Food Preparation Workers; Bartenders; Combined Food Preparation and Serving Workers, Including Fast Food; Counter Attendants, Cafeteria, Food Concession, and Coffee Shop; Baristas; Waiters and Waitresses; Food Servers, Nonrestaurant; Dining Room and Cafeteria Attendants and Bartender Helpers; Dishwashers; Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop

TRAVEL & TOURISM PATHWAY

OCCUP.

- **Personal Care & Service**
Tour Guides and Escorts; Travel Guides
- **Sales & Related**
Travel Agents
- **Office & Administrative Support**
Reservation and Transportation Ticket Agents and Travel Clerks





Selected Careers

| Occupation* | Job Description |
|--|---|
| Animal Trainers | Train animals for riding, harness, security, performance, or obedience, or for assisting persons with disabilities. |
| Athletes & Sports Competitors | Compete in athletic events. |
| Bakers | Mix and bake ingredients to produce breads, rolls, cookies, cakes, pies, pastries, or other baked goods. |
| Bartenders | Mix and serve drinks to patrons, directly or through waitstaff. |
| Chefs & Head Cooks | Direct and may participate in preparing, seasoning, and cooking salads, soups, fish, meats, vegetables, desserts, or other foods. May plan and price menu items, order supplies, and keep records and accounts. |
| Cooks, Institution & Cafeteria | Work in school, cafeteria, business, hospital, and other institutions' kitchens, preparing a large quantity of a limited number of entrees, vegetables, and desserts according to preset menus. |
| First-Line Supervisors of Food Preparation & Serving Workers | Directly oversee and coordinate activities of workers engaged in preparing and serving food in a variety of settings. |
| First-Line Supervisors of Housekeeping & Janitorial Workers | Directly oversee and coordinate work activities of cleaning personnel in hotels, hospitals, offices, and other establishments. |
| Food Preparation Workers | Perform a variety of food preparation duties other than cooking, such as preparing cold foods and shellfish, slicing meat, and brewing coffee or tea. |
| Food Service Managers | Plan, direct, or coordinate activities of an organization or department that serves food and beverages. |
| Hotel, Motel, & Resort Desk Clerks | Help customers in practical ways, such as making room reservations, supplying customers with information, and providing a bill for their accommodations. |
| Janitors & Cleaners, Except Maids & Housekeeping Cleaners | Keep many types of buildings clean, orderly, and in good condition. |
| Lodging Managers | Plan, direct, or coordinate activities of an organization or department that provides lodging and other accommodations. |
| Recreation Workers | Design and lead leisure activities for groups in volunteer agencies or recreation facilities like playgrounds, parks, camps, aquatic, and senior centers. Activities may include arts and crafts, sports, adventure programs, music, and camping. |
| Reservation & Transportation Ticket Agents & Travel Clerks | Sell, make, and confirm reservations for transportation or lodging. Check in baggage and direct passengers to departure areas. |
| Tour Guides & Escorts | Escort individuals or groups on sightseeing tours or through places of interest, such as industrial establishments, public buildings, and art galleries. |
| Travel Agents | Plan and sell transportation and accommodations to travel agency customers. |
| Waiters & Waitresses | Take orders and serve food and beverages to patrons at tables in dining establishments. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--------------------------------------|------------------|----------------------------|--------------------------------|--|-----------------|
| Recreation, Amusements & Attractions | ★★★ | ★★★★★ | \$17,900 / \$23,460 | High school diploma, moderate-term on-the-job training | R |
| Recreation, Amusements & Attractions | ★★ | ★★★★★ | \$26,390 / \$47,710 † | No formal educational credential | RE |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$17,450 / \$22,850 | No formal educational credential | RC |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$17,230 / \$19,320 | No formal educational credential | ECR |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$33,250 / \$47,280 | High school diploma or equivalent | ERA |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$18,530 / \$23,330 | No formal educational credential | RC |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$22,190 / \$31,180 | High school diploma or equivalent | ECR |
| Lodging | ★★★★★ | ★★★ | \$25,940 / \$35,550 | High school diploma or equivalent | ECR |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$17,270 / \$19,820 | No formal educational credential | RC |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★★★ | \$40,360 / \$56,810 | High school diploma or equivalent | ECR |
| Lodging | ★★★★★ | ★★★ | \$17,340 / \$20,340 | High school diploma, short-term on-the-job training | CES |
| Lodging | ★★★★★ | ★★★ | \$17,260 / \$21,240 | No formal educational credential | RC |
| Lodging | ★★★ | ★★★ | \$34,950 / \$49,560 | High school diploma or equivalent | ECS |
| Recreation, Amusements & Attractions | ★★★★★ | ★★★★★ | \$17,450 / \$24,470 | High school diploma, short-term on-the-job training | SEA |
| Travel & Tourism | ★★★★★ | ★ | \$22,720 / \$34,230 | High school diploma, short-term on-the-job training | CES |
| Travel & Tourism | ★★★ | ★★★ | \$19,100 / \$23,310 | High school diploma, moderate-term on-the-job training | SE |
| Travel & Tourism | ★★★ | ★ | \$24,320 / \$42,000 | High school diploma, moderate-term on-the-job training | EC |
| Restaurants & Food/Beverage Services | ★★★★★ | ★★★ | \$17,220 / \$18,700 | No formal educational credential | SEC |

† US Median Data

Career Story



Daniel Griffin

Asheville-Buncombe Technical Community College
A.A.S., *Hospitality Management*

For Daniel Griffin, Director of Food and Beverage at Aloft Hotel, a field trip to a local hotel as part of a class at Asheville-Buncombe Technical Community College led Daniel to know that he wanted to work at the Aloft Hotel in Downtown Asheville.

"I am able to use the skills I learned in school to shape the operation."

"Everyone loved their job and the company they were working for, so I knew that it was the place for me."

While still enrolled in the Hospitality Management program at A-B Tech, Daniel started an internship at the Aloft Hotel, starting at the front desk and working in all aspects of the hotel and restaurant. After one year, he worked his way up

to his current position and oversees the hotel's restaurants as well as banquets and special events.

Daniel loves the people with whom he works.

"I had never worked for a company where I felt like I was a part of a family. I also love the creative freedom this position allows. I am able to use the skills I learned in school to shape the operation of the food and beverage department while also collaborating with other departments."

Daniel credits the education he received at A-B Tech with his acceptance and fast rise to management. The local hospitality industries work closely with A-B Tech to ensure they are developing employees who can work in all aspects of the hospitality industry.

Daniel's advice to those considering a career in hospitality is to immerse yourself in the industry as soon as possible, like he did through his internship. This process will allow you to have experience in the industry/career that you aspire to and also help you begin building your network of industry professionals.



Tell Me About...

FOOD SERVICE MANAGERS

Food service managers plan, direct, or coordinate activities of an organization or department that serves food and beverages. They commonly work indoors in climate-controlled settings and spend a fair amount of their days standing. These managers are often physically close to others, nearly touching them. Their workdays include some face-to-face and telephone discussions. At times, they must make decisions that have an impact on staff and on their companies. Being able to work well in a group or team is very important in this work. Dealing with customers is a somewhat important part of this work. Many food service managers work full time.

For more information about this career and 560 other occupations:
nccareers.org/occupationalprofiles/index.html





Human Services

From mental health counselors to hairdressers, human services workers provide a wide range of assistance to individuals and families. People who choose to work in this cluster usually have a deep desire to enrich and make life easier for others.

What kinds of services do human services customers need? They may benefit from rehabilitation therapy; psychological assistance; help with daily activities such as meal preparation or housekeeping; spiritual guidance; or health education. Their needs have an impact on where workers provide services. Psychologists and social and community service managers are likely to work in office settings. Others like clergy and social workers may work part of the time in an office and may also visit people at home.

Since the services provided in this industry vary greatly, workers in this cluster have educational backgrounds that range from high school diplomas to doctorates. They may also need credentials such as certifications and licenses. Social assistance organizations and local and state government tend to offer more human services jobs than do other work settings.

CAREER RESEARCH

- National Association of Social Workers socialworkers.org
- National Association for Family Child Care nafcc.org
- Association for Early Learning Leaders earlylearningleaders.org
- Associated Bodywork & Massage Professionals abmp.com
- US Department of Health and Human Services hhs.gov/about/careers/index.html

Find more Human Services occupations at onetonline.org/find/career?c=10

Specific jobs can happen in a variety of settings.

| OCCUPATION: SOCIAL WORKER | EMPLOYMENT | % OCCUPATION EMPLOYMENT | MEDIAN ANNUAL WAGE |
|---|------------|-------------------------|--------------------|
| Social Assistance | 1,682 | 16.0% | \$37,080 |
| Religious, Civic, & Similar Organizations | 975 | 9.3% | \$42,610 |
| Educational Services | 850 | 8.1% | \$48,610 |

For more information about industry employment: nccareers.org/staffingpatterns/staffing_patterns.html



Did You Know...





Core Skills

- Social Perceptiveness
- Service Orientation
- Persuasion
- Negotiation
- Learning Strategies
- Active Listening
- Speaking
- Coordination
- Management of Personnel Resources
- Instructing



CONSUMER SERVICES PATHWAY

OCCUP.

- Business & Financial Operations
Credit Counselors; Loan Counselors



COUNSELING & MENTAL HEALTH SERVICES PATHWAY

OCCUP.

- **Life, Physical & Social Science**
Clinical, Counseling, and School Psychologists; School Psychologists; Clinical Psychologists; Counseling Psychologists; Industrial-Organizational Psychologists; Neuropsychologists and Clinical Neuropsychologists
- **Community & Social Service**
Substance Abuse and Behavioral Disorder Counselors; Marriage and Family Therapists; Mental Health Counselors; Rehabilitation Counselors; Mental Health and Substance Abuse Social Workers

FAMILY & COMMUNITY SERVICES PATHWAY

OCCUP.

- **Management**
Social and Community Service Managers
- **Community & Social Service**
Child, Family, and School Social Workers; Healthcare Social Workers; Health Educators; Social and Human Service Assistants; Community Health Workers; Clergy; Directors, Religious Activities and Education

PERSONAL CARE SERVICES PATHWAY

OCCUPATION

- **Management**
Funeral Service Managers
- **Healthcare Support**
Massage Therapists
- **Production**
Laundry and Dry-Cleaning Workers; Pressers, Textile, Garment, and Related Materials; Tailors, Dressmakers, and Custom Sewers
- **Personal Care & Service**
First-Line Supervisors of Personal Service Workers; Spa Managers; Locker Room, Coatroom, and Dressing Room Attendants; Embalmers; Funeral Attendants; Morticians, Undertakers, and Funeral Directors; Barbers; Hairdressers, Hairstylists, and Cosmetologists; Manicurists and Pedicurists; Shampooers; Skincare Specialists; Personal Care Aides; Fitness Trainers and Aerobics Instructors; Residential Advisors

EARLY CHILDHOOD DEVELOPMENT & SERVICES PATHWAY

OCCUP.

- **Personal Care & Service**
Childcare Workers; Nannies





Selected Careers

| Occupation* | Job Description |
|--|--|
| Child, Family, & School Social Workers | Provide social services and assistance to improve the social and psychological functioning of children and their families. Work to maximize family well-being and to help children do well in school. |
| Childcare Workers | Care for children when family members are not available, tending to children's basic needs, such as bathing and feeding; helping children prepare for kindergarten; or assisting older children with homework. |
| Clinical, Counseling, & School Psychologists | Diagnose and treat psychological disorders; learning disabilities; and cognitive, behavioral, and emotional problems using individual, child, family, and group therapies. Clients served depend upon psychologist's training and work setting. |
| Community Health Workers | Help individuals and communities adopt healthy behaviors. Conduct outreach for medical personnel or health organizations to implement programs in the community that promote, maintain, and improve individual and community health. |
| Credit Counselors | Advise and teach individuals or organizations about acquiring and managing debt. May help clients decide about loans or manage their debts. |
| First-Line Supervisors of Personal Service Workers | Directly supervise and coordinate activities of personal service workers such as flight attendants, hairdressers, or caddies. |
| Fitness Trainers & Aerobics Instructors | Instruct or coach groups or individuals in exercise activities. Demonstrate techniques and form, observe participants, and explain corrective measures for improving their skills. |
| Funeral Service Managers | Plan, direct, or coordinate the services and resources of funeral homes. Work Includes activities like determining prices for services or merchandise and managing funeral home facilities. |
| Health Educators | Provide and manage health education programs that help individuals, families, and communities maximize and maintain healthy lifestyles. May collect and analyze data to identify community needs before planning, implementing, monitoring, and evaluating programs. |
| Healthcare Social Workers | Help people solve and cope with problems related to health challenges. |
| Massage Therapists | Treat clients by using touch to manipulate the soft-tissues of the body. Relieve pain, help rehabilitate injuries, improve circulation, relieve stress, increase relaxation, and aid in the general wellness of clients. |
| Mental Health & Substance Abuse Social Workers | Assess and treat people who have mental, emotional, or substance abuse problems, including abuse of alcohol, tobacco, and/or other drugs. |
| Mental Health Counselors | Help people manage and overcome psychological and relationship problems. |
| Morticians, Undertakers, & Funeral Directors | Perform various tasks to arrange and direct funeral services, such as coordinating transportation of the body to the mortuary, interviewing family or other authorized persons to arrange details, and selecting pallbearers. |
| Personal Care Aides | Care for and assist people who are elderly, recovering from illness or injury, or who have disabilities. |
| Rehabilitation Counselors | Help people who have emotional and physical disabilities live and work independently. |
| Skincare Specialists | Provide skincare treatments to face and body to enhance an individual's appearance. |
| Social & Community Service Managers | Coordinate and supervise social service programs and community organizations. Direct and lead staff who provide social services to the public. |
| Social & Human Service Assistants | Help people get through difficult times or obtain additional support. Assist other workers, such as social workers, and help clients find benefits or community services. |
| Substance Abuse & Behavioral Disorder Counselors | Counsel individuals with alcohol, tobacco, drug, or other problems such as gambling or eating disorders. May counsel individuals, families, or groups and participate in prevention programs. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--|------------------|----------------------------|--------------------------------|---|-----------------|
| Family & Community Services | ★★★★★ | ★★★ | \$34,690 / \$45,380 | Bachelor's degree | SE |
| Early Childhood Development & Services | ★★★★★ | ★★★ | \$17,280 / \$19,990 | High school diploma, short-term on-the-job training | SA |
| Counseling & Mental Health Services | ★★★★★ | ★★★★★ | \$45,020 / \$60,400 | Doctoral or professional degree | IS |
| Family & Community Services | ★★★ | ★★★★★ | \$27,550 / \$37,790 | High school diploma, short-term on-the-job training | SIE |
| Consumer Services | ★★★ | ★★★★★ | \$31,390 / \$41,580 | Bachelor's degree | ESC |
| Personal Care Services | ★★★★★ | ★★★★★ | \$24,750 / \$35,490 | High school diploma or equivalent | ECS |
| Personal Care Services | ★★★★★ | ★★★★★ | \$20,760 / \$35,520 | High school diploma, short-term on-the-job training | SRE |
| Personal Care Services | ★★ | ★★ | \$64,830 / \$82,260 | Associate's degree | ECS |
| Family & Community Services | ★★★ | ★★★★★ | \$36,550 / \$49,580 | Bachelor's degree | SE |
| Family & Community Services | ★★★★★ | ★★★★★ | \$39,640 / \$50,920 | Master's degree | SI |
| Personal Care Services | ★★★★★ | ★★★★★ | \$26,980 / \$42,340 | Postsecondary nondegree award | SR |
| Counseling & Mental Health Services | ★★★★★ | ★★★★★ | \$34,710 / \$45,940 | Bachelor's degree | SIA |
| Counseling & Mental Health Services | ★★★★★ | ★★★★★ | \$35,280 / \$46,530 | Master's degree | SIA |
| Personal Care Services | ★★★ | ★★★ | \$38,610 / \$55,630 | Associate's degree | ESC |
| Personal Care Services | ★★★★★ | ★★★★★ | \$17,150 / \$20,230 | High school diploma or equivalent | SRC |
| Counseling & Mental Health Services | ★★★★★ | ★★★ | \$21,980 / \$37,290 | Master's degree | SI |
| Personal Care Services | ★★★ | ★★★★★ | \$20,660 / \$32,120 | Postsecondary nondegree award | ESR |
| Family & Community Services | ★★★★★ | ★★★★★ | \$42,740 / \$64,900 | Bachelor's degree | ES |
| Family & Community Services | ★★★★★ | ★★★★★ | \$21,380 / \$28,270 | High school diploma, short-term on-the-job training | CSE |
| Counseling & Mental Health Services | ★★★★★ | ★★★★★ | \$33,810 / \$42,640 | Bachelor's degree | SAI |



Career Story



Nadja Gustafson

**Asheville-Buncombe Technical Community College
A.A.S., Health and Fitness Science**

Certification: ACE Personal Trainer

Passionate about exercise, Nadja Gustafson has always pursued a high level of fitness for herself. She spent much of her adult life as an artist and craftsperson working as a metalsmith, glassblower, and musical instrument repair technician. Her change of career began when the Associate Dean of the Arts and Science department at Asheville-Buncombe Technical Community College spotted her working out at the YMCA and told her about the program in Health and Fitness Science at AB Tech.

Enrollment in the program inspired a newly discovered love of science, anatomy, and physiology.

She knew immediately that this was something she wanted, so she began the process of enrolling in an associate degree program in Health and Fitness Science at A-B Tech. Two years later she walked across the stage to get her degree, having passed the ACE Personal Trainer Certification exam earlier that spring.

The Health and Fitness Program at A-B Tech inspired a newly discovered love of science, specifically anatomy and physiology. Gustafson's college internship with Asheville City Parks and Recreation turned into a lasting relationship in terms of employment and friendship with the staff and

members. Her experience working at Stephens-Lee and Shiloh recreation centers led her toward her interest in working at the Women's Correctional Facility through Light a Path.

Gustafson currently works at the YMCA of Western North Carolina as a personal trainer, group exercise instructor, and a Health and Wellness Coach. In her various roles at the YMCA, Gustafson works with members on setting up programs and workouts, proper use of the equipment, as well as specific exercises for that member's needs.

She also works for Asheville City Parks and Recreation as a contractual personal trainer assisting city employees and fitness center members with use of equipment and circuit training.

Gustafson loves her new job and career. Her favorite things are working with all different kinds of people at varying levels of fitness and being a positive part of assisting people in improving their health and wellness. Having the opportunity to wear different hats within that scope keeps her on her toes, and she loves remaining curious and constantly learning.

Gustafson's advice to anyone interested in becoming a personal training and group exercise instructor is to stay interested in and open about all aspects of the career. Hone your listening skills so that you truly hear what your client says. Be open to feedback from your clients as well as other trainers who have been in the field. Continue to study anatomy and physiology so you can understand how the body works.



Information Technology

Maybe you used to shop more at the mall but now order things online. Smart electronics can give travel directions and even turn on your oven while you're out. You can push a button to start your car and immediately stop to move the bicycle that showed up in your backup camera. Who's responsible for these tools?

Workers in the information technology (IT) industry develop the software and hardware that make our lives easier, and they fix and help us use these tools. As organizations and individuals face the threats and consequences of data theft, they need information security analysts to maintain online safety and privacy. In North Carolina, this occupation has the third highest expected percentage of new job growth in the IT career cluster. Because they occur in almost any industry, the three IT occupations that are likely to have the largest total job openings in North Carolina include applications software developers, computer user support specialists, and computer systems analysts.

All IT jobs are professional, and most new jobs will require postsecondary education. IT careers can be found in many work settings. The kinds of organizations most likely to employ IT workers include: custom computer programming companies; computer systems design companies; corporate and regional managing offices; software publishers; and data processing and hosting businesses.

IT has changed the technical skills required in many occupations. While reducing the availability of some jobs, it has also produced totally new career options. As IT continues to evolve, we will need to keep pace with its changes in our workplaces.

CAREER RESEARCH

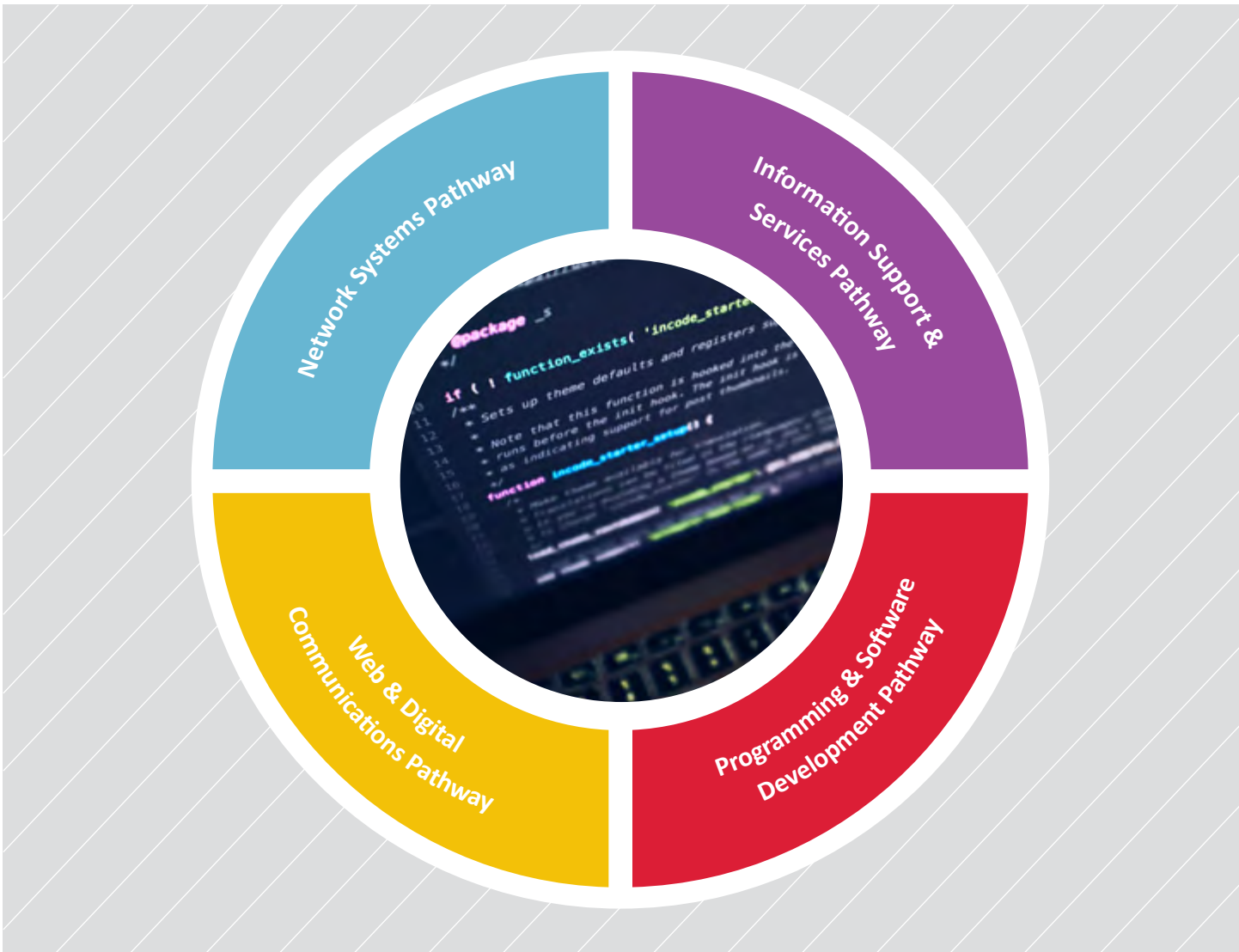
- Center of Excellence for Information and Computing Technology
coeforict.org
- National Center for Women and Information Technology
ncwit.org
- Institute of Electrical and Electronics Engineers Computer Society
computer.org/web/guest
- Technology Services Industry Association
tsia.com
- National Center for Systems Security and Information Assurance
cssia.org/index.cfm

Find more Information Technology occupations at onetonline.org/find/career?c=11



Core Skills

- Programming
- Technology Design
- Installation
- Operations Analysis
- Systems Evaluation
- Systems Analysis
- Troubleshooting
- Complex Problem Solving
- Quality Control Analysis
- Equipment Selection



INFORMATION SUPPORT & SERVICES PATHWAY

OCCUP.

- **Computer & Mathematical**
Computer User Support Specialists; Software Quality Assurance Engineers and Testers; Computer Systems Engineers/Architects; Web Administrators; Geospatial Information Scientists and Technologists;

Geographic Information Systems Technicians; Database Architects; Data Warehousing Specialists; Business Intelligence Analysts; Information Technology Project Managers; Search Marketing Strategists; Video Game Designers; Document Management Specialists



PROGRAMMING & SOFTWARE DEVELOPMENT PATHWAY

OCCUP.

- **Computer & Mathematical**
Computer Systems Analysts; Informatics Nurse Specialists; Computer Programmers; Software Developers, Applications; Software Developers, Systems Software

WEB & DIGITAL COMMUNICATIONS PATHWAY

OCCUP.

- **Computer & Mathematical**
Web Developers

NETWORK SYSTEMS PATHWAY

OCCUP.

- **Computer & Mathematical**
Information Security Analysts; Database Administrators; Network and Computer Systems Administrators; Computer Network Architects;

Telecommunications Engineering Specialists; Computer Network Support Specialists



Ways to match your skills with occupations.

Has anyone ever told you that you're really good at doing something? Have you noticed that others seem to have a knack for carrying out an activity that is difficult for you to do? Each of us has skills, but most of us aren't talented at performing all types of tasks. Experience, training, and our inborn abilities contribute to what we're "good" at.

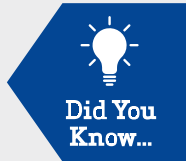
Several online resources can help you match your current skills with occupations, but keep in mind two important factors:

1. Your skills are unlikely to be as strong as they will be after further education and experience.
2. Your interests and other factors, like values and preferred work environment, also contribute to finding good career matches.

Resources:

Careeronestop's Skills Matcher: careeronestop.org/toolkit/Skills/skills-matcher.aspx

mySkills myFuture: myskillsmyfuture.org





Selected Careers

| Occupation* | Job Description |
|---|--|
| Computer Network Architects | Based on an organization's goals, design and build data communication networks ranging from simple connections between two offices to complex multinational communication systems. |
| Computer Network Support Specialists | Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. |
| Computer Programmers | Create, modify, and test the code, forms, and script that allow computer applications to run. Work from specifications drawn up by software developers or other individuals. |
| Computer Systems Analysts | Study an organization's computer systems and procedures. Design information system solutions to help the organization operate more efficiently and effectively by understanding both business and information technology (IT). |
| Computer User Support Specialists | Help people who have computer problems through phone, email, or in-person visits. Often work under network and computer systems administrators, who handle more complex tasks. |
| Database Administrators | Use specialized software to store and organize data, such as financial information and customer shipping records. Make sure that data are available to users and are secure from unauthorized access. |
| Information Security Analysts | Plan and carry out security measures to protect an organization's computer networks and systems. Responsibilities are continually expanding as the number of cyberattacks increase. |
| Network & Computer Systems Administrators | Responsible for the day-to-day operation of the computer networks that are critical parts of almost every organization. |
| Software Developers, Applications | Use creativity to develop applications that allow people to do specific tasks when using technology tools. |
| Software Developers, Systems Software | Create the systems that keep computers working well, including systems for personal computers and customized systems for an organization, telephones, cars, or other electronic products. |
| Web Developers | Design and create websites. Responsible for the website's design and technical aspects like its speed and the amount of traffic it can handle. May also create content for the site. |

Did You Know...

You can find public college information at NC Tower.

Trying to decide about an IT major?

Computer Engineering ?

Systems Analyst ?

Networking Technology ?

Information Security ?

Computer Programming ?

Web Technologies ?

Database Management ?

Software Engineering ?

Computer Science ?

Information Security ?



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/Median Wages* | Minimum Education* | Interest Areas* |
|------------------------------------|------------------|----------------------------|----------------------------|-------------------------|-----------------|
| Network Systems | ★★★★★ | ★★★★★ | \$68,730 / \$103,310 | Bachelor's degree | ICE |
| Network Systems | ★★★★★ | ★★★★★ | \$38,910 / \$62,560 | Associate's degree | REC |
| Programming & Software Development | ★★★★★ | ★ | \$55,580 / \$85,550 | Bachelor's degree | IC |
| Programming & Software Development | ★★★★★★ | ★★★★★★ | \$62,290 / \$89,220 | Bachelor's degree | ICR |
| Information Support & Services | ★★★★★★ | ★★★★★★ | \$31,420 / \$47,970 | Some college, no degree | RIC |
| Network Systems | ★★★ | ★★★★★★ | \$52,210 / \$87,470 | Bachelor's degree | CI |
| Network Systems | ★★★★★ | ★★★★★★ | \$66,550 / \$98,010 | Bachelor's degree | CIR |
| Network Systems | ★★★★★★ | ★★★★★ | \$542,00 / \$80,010 | Bachelor's degree | IRC |
| Programming & Software Development | ★★★★★★ | ★★★★★★ | \$64,650 / \$95,100 | Bachelor's degree | IRC |
| Programming & Software Development | ★★★★★★ | ★★★★★ | \$78,290 / \$108,270 | Bachelor's degree | ICR |
| Web & Digital Communications | ★★★★★ | ★★★★★★ | \$41,900 / \$69,940 | Associate's degree | CIR |

Wondering where you could get a degree?

Want to compare employment outcomes from specific colleges? Curious about potential income?

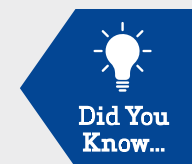
Look no further than NC Tower for information about our state's public community colleges and universities.

In addition to answers to these questions, you'll discover data that show:

- Top-paying bachelor's degree programs
- Top-paying associate's degree programs
- Popular university degrees
- Popular community college degrees
- Median wages by college and degree

Discover wage, graduation, employment data and more.

nctower.com/landing/index.html





Career Story



Chris Mathews

Wake Technical Community College
A.S., *Business Analytics*

Fifty-year-old Chris Mathews has been working in Wake County's information technology department for more than a decade. A few years ago he decided to go back to school to learn a new set of skills. Chris loves crunching numbers and wanted to pursue an Associate of Science degree in Business Analytics, a fast-growing field and one he thought might help boost his career. He did some research and quickly settled on Wake Tech.

Chris already has a new job! He beat out more than 80 other applicants and was just hired as Wake County's very first data scientist. In his new role Chris will identify, connect, and extract valuable conclusions for disparate data sets to help Wake County address its most pressing business problems and reach community goals.

Chris' boss sings his praises:

“Wake Tech offered online classes that I could work into my schedule.”

“Wake Tech offered online classes that I could work into my schedule,” says Chris. “Plus, do the math - they are affordable!”

Chris enrolled and quickly got started. He did homework before and after work at his home in Clayton, often studying with his wife, who was also taking classes at Wake Tech. Chris also attended study sessions with fellow students and instructors at night.

“It's not easy balancing a job with my studies, but I am learning so much, and it's paying off in a big way!”

“Chris has worked with business units across the county from clinics, to libraries, to environmental services, to animal shelters, and detention services,” says Paula Roberson, Wake County Assistant IT Director. “He has taken the time to learn about the data they collect, and each one's true mission so he can better serve them now and in the future. While his tech skills are awesome, his approachability, easy way, and willingness to assist are the traits that will guarantee his success in this new role.”

Chris has a few more classes to take before he completes his degree in the fall, but he's already hard at work at his new job. Chris is excited and says he wouldn't have been able to tackle a new challenge in the workplace without additional education and training. “Wake Tech gave me a brand new set of skills to help me move to a new stage in my career. It's been a wonderful experience.”



Law, Public Safety, Corrections & Security

When there's something strange in your neighborhood, who are you going to call? Typically, someone from this career cluster will respond to your request for help. These workers protect us from crime and other sources of harm like natural disasters. They help us receive fair treatment and seek justice when we've been wronged. Some workers also set up and implement security plans.

If you pay attention to the evening news or watch television dramas, you're aware of the most obvious occupations in this industry: police officers, firefighters, and lawyers. Less obvious jobs in this cluster include lifeguards and ski patrol workers and animal control workers. Occupations with large projected 10-year increases in openings include lawyers and emergency medical technicians.

Work environments and educational backgrounds differ in these occupations. Although some workers stay in offices most of the day, others work outdoors. For certain jobs, workers must pass medical exams and demonstrate strength and agility. Some careers may be dangerous and require shift work, sometimes with long hours. Many of these jobs can be found at all levels of government, in law offices, and security businesses.

CAREER RESEARCH

- American Bar Association
americanbar.org/aba.html
- U.S. Department of Homeland Security
dhs.gov
- National Institute of Corrections
nicic.gov
- Fraternal Order of Police
fop.net/Index.aspx
- Federal Law Enforcement Jobs
federaljobs.net/law.htm

Find more Law, Public Safety, Corrections & Security occupations at onetonline.org/find/career?c=12



Core Skills

- Negotiation
- Persuasion
- Social Perceptiveness
- Active Listening
- Speaking
- Critical Thinking
- Writing
- Judgment and Decision Making
- Service Orientation
- Coordination



CORRECTION SERVICES PATHWAY

OCCUP.

- Community & Social Service
Probation Officers and Correctional Treatment Specialists
- Protective Service
First-Line Supervisors of Correctional Officers; Correctional Officers and Jailers



EMERGENCY & FIRE MANAGEMENT SERVICES PATHWAY

OCCUPATION

- **Healthcare Practitioners & Technical**
Emergency Medical Technicians and Paramedics
- **Office & Administrative Support**
Police, Fire & Ambulance Dispatchers
- **Protective Service**
First-Line Supervisors of Fire Fighting and Prevention Workers; Municipal Fire Fighting and Prevention Supervisors; Forest Fire Fighting and Prevention Supervisors; Firefighters; Municipal Firefighters; Forest Firefighters; Fire Inspectors and Investigators; Fire Inspectors; Fire Investigators; Forest Fire Inspectors and Prevention Specialists

LAW ENFORCEMENT SERVICES PATHWAY

OCCUPATION

- **Protective Service**
First-Line Supervisors of Police and Detectives; Detectives and Criminal Investigators; Police Detectives; Police Identification and Records Officers; Criminal Investigators and Special Agents; Immigration and Customs Inspectors; Intelligence Analysts; Fish and Game Wardens; Parking Enforcement Workers; Police and Sheriff's Patrol Officers; Police Patrol Officers; Sheriffs and Deputy Sheriffs; Transit and Railroad Police; Animal Control Workers; Private Detectives and Investigators
- **Life, Physical, & Social Science**
Forensic Science Technicians

LEGAL SERVICES PATHWAY

OCCUP.

- **Legal**
Lawyers; Judicial Law Clerks; Administrative Law Judges, Adjudicators, and Hearing Officers; Arbitrators, Mediators, and Conciliators; Judges, Magistrate Judges, and Magistrates; Paralegals and Legal Assistants; Court Reporters; Title Examiners, Abstractors, and Searchers
- **Office & Administrative Support**
Legal Secretaries

SECURITY & PROTECTIVE SERVICES PATHWAY

OCCUP.

- **Protective Service**
Bailiffs; Gaming Surveillance Officers and Gaming Investigators; Security Guards; Crossing Guards; Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers; Retail Loss Prevention Specialists





Selected Careers

| Occupation* | Job Description |
|--|--|
| Animal Control Workers | Handle animals for the purpose of investigations of mistreatment, or control of abandoned, dangerous, or unattended animals. |
| Correctional Officers & Jailers | Guard inmates in penal or rehabilitative institutions according to established regulations and procedures. May guard prisoners in transit between jail, courtroom, prison, or other point. |
| Detectives & Criminal Investigators | Gather facts and collect evidence of possible crimes. |
| Emergency Medical Technicians & Paramedics | Care for the sick or injured in emergencies. potentially saving people's lives. Often work with police and firefighters at the emergency scene. |
| Fire Inspectors & Investigators | Examine buildings to detect fire hazards and ensure that federal, state, and local fire codes are met (fire inspectors). Determine the origin and cause of fires and explosions (fire investigators). |
| Firefighters | Control fires and respond to other emergencies, including medical emergencies. |
| First-Line Supervisors of Correctional Officers | Directly supervise and coordinate activities of correctional officers and jailers. |
| First-Line Supervisors of Fire Fighting & Prevention Workers | Supervise firefighters who control and put out municipal fires, protect life and property, and conduct rescue efforts or oversee firefighters who control and suppress fires in forests or vacant public land. |
| First-Line Supervisors of Police & Detectives | Directly supervise and coordinate activities of members of a police force. |
| Forensic Science Technicians | Collect, identify, classify, and analyze physical evidence related to criminal investigations. Perform tests on weapons or substances to determine their significance to an investigation. |
| Lawyers | Advise and represent individuals, businesses, and government agencies on legal issues and disputes. |
| Legal Secretaries | Perform secretarial duties using legal terminology, procedures, and documents. May also assist with legal research. |
| Paralegals & Legal Assistants | Perform a variety of tasks to support lawyers, including maintaining and organizing files, conducting legal research, and drafting documents. |
| Police & Sheriff's Patrol Officers | Protect lives and property. |
| Private Detectives & Investigators | Gather, analyze, compile and report information about individuals or organizations to clients, or detect occurrences of unlawful acts or infractions of rules in a private establishment. |
| Probation Officers & Correctional Treatment Specialists | Provide social services to help rehabilitate law offenders in custody or on probation or parole. Make recommendations for actions involving establishing the rehabilitation plan and treatment of offender, including conditional release and education. |
| Security Guards | Protect, patrol, and check property to prevent theft, vandalism, violence, and illegal activity. May operate x-ray and metal detector equipment. |
| Title Examiners, Abstractors, & Searchers | Search real estate records, examine titles, or summarize necessary legal or insurance documents or details for a variety of purposes. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--------------------------------------|------------------|----------------------------|--------------------------------|--|-----------------|
| Law Enforcement Services | ★★ | ★★★★ | \$26,700 / \$32,480 | High school diploma, moderate-term on-the-job training | RSC |
| Correction Services | ★★★★★ | ★ | \$29,710 / \$31,420 | High school diploma, moderate-term on-the-job training | REC |
| Law Enforcement Services | ★★★★ | ★★ | \$39,530 / \$48,660 | High school diploma, moderate-term on-the-job training | EI |
| Emergency & Fire Management Services | ★★★★★ | ★★★★★ | \$24,910 / \$33,640 | Postsecondary nondegree award | SIR |
| Emergency & Fire Management Services | ★★ | ★★★★ | \$37,070 / \$52,220 | Postsecondary nondegree award | CR |
| Emergency & Fire Management Services | ★★★★★ | ★★★★ | \$22,240 / \$32,180 | Postsecondary nondegree award | RS |
| Correction Services | ★★★ | ★★ | \$37,660 / \$42,790 | High school diploma, moderate-term on-the-job training | ECR |
| Emergency & Fire Management Services | ★★★ | ★★★★ | \$46,840 / \$63,540 | Postsecondary nondegree award | ER |
| Law Enforcement Services | ★★★★ | ★★ | \$51,780 / \$69,520 | No formal education credential | ESC |
| Law Enforcement Services | ★★ | ★★★★★ | \$34,650 / \$43,140 | Bachelor's degree | IRC |
| Legal Services | ★★★★★ | ★★★★ | \$54,980 / \$113,430 | Doctoral or professional degree | EI |
| Legal Services | ★★★ | ★ | \$30,060 / \$47,090 | High school diploma, moderate-term on-the-job training | CE |
| Legal Services | ★★★★★ | ★★★★ | \$30,060 / \$42,530 | Associate's degree | CIE |
| Law Enforcement Services | ★★★★★ | ★★ | \$32,880 / \$43,360 | High school diploma, moderate-term on-the-job training | RE |
| Law Enforcement Services | ★★ | ★★★★ | \$30,010 / \$45,770 | High school diploma, moderate-term on-the-job training | EC |
| Correction Services | ★★★ | ★ | \$35,400 / \$38,560 | Bachelor's degree | SEC |
| Security & Protective Services | ★★★★★ | ★★★★ | \$19,130 / \$24,140 | High school diploma, short-term on-the-job training | RCE |
| Legal Services | ★★ | ★★ | \$30,350 / \$40,800 | Moderate-term on-the-job training | CER |



Career Story



Eric Southerland

James Sprunt Community College

A.A.S., Criminal Justice

Certification: Basic Law Enforcement Training

Ever since high school, Eric Southerland knew that he wanted to go into law enforcement.

“It was my first choice in a survey for career paths,” said Eric.

While attending James Kenan High School, Southerland was fortunate enough to be selected as one of the founding members of the Duplin County Explorers with the Duplin County Sheriff's Office, a program designed just for high school students.

Earning one credential at James Sprunt allowed Eric to work for over 20 years, having a successful career doing what he loves most.

“Sheriff Garner reached out and started the Explorers program for those interested in law enforcement. That program is still in existence today. It helped me experience what it would be like to work in the Sheriff's Office.”

This introduction to the Sheriff's Office led Southerland to obtain his BLET (Basic Law Enforcement Training) certificate at James Sprunt Community College. Earning that credential at James Sprunt enabled him to work for over 20 years for the Duplin County Sheriff's Office, having a successful career doing what he loves most.

Fast forward to today, and you'll find Southerland still working as an officer of the law, except now he is working full-time as the Police Chief of the Warsaw Police Department while also serving as the Director of the Basic Law Enforcement Training program at James Sprunt Community College.

On his job as a BLET director, Southerland says, “I love being able to train new recruits to become a good, positive influence in the community. It was a great opportunity and I have discovered that I enjoy teaching and training new recruits about what it takes to become a police officer – and most importantly, a good officer.”

In addition to earning his BLET certification, Southerland has also earned an Associate in Applied Science degree in Criminal Justice from James Sprunt Community College, a degree that isn't required for his job as an officer, but a personal goal that he had always wanted to obtain.



Manufacturing

Although manufacturing often brings to mind huge, wide-open factory floors, it also includes small businesses. Manufacturing businesses can range from in-home bakeries to large corporations like Siemens. One thing most manufacturing businesses have in common: increasing use of technology. From roastmasters who use programmable coffee roasting machines to industrial engineering technicians who operate 3-D printers that make metal parts, manufacturing is quite different than it was even a decade ago.

Manufacturing workers change materials, substances, or components into new products. Manufactured goods include or are made from chemicals, computers and electronics, fabricated metal products, food, machinery, plastics and rubber products, or transportation equipment. While businesses still hire workers for traditional mass production of simple products, manufacturing jobs increasingly use technologies that enable workers to customize, shorten production time, and create lighter weight, more durable products.

Manufacturing includes occupations with a variety of education and experience backgrounds, but job numbers have been decreasing in occupations that require the least amount of education. North Carolina's growth careers in manufacturing often involve installing, maintaining, and repairing increasingly technical equipment. Industries most likely to hire this cluster's workers include temporary service agencies, poultry processing plants, and furniture and drug manufacturers.

CAREER RESEARCH

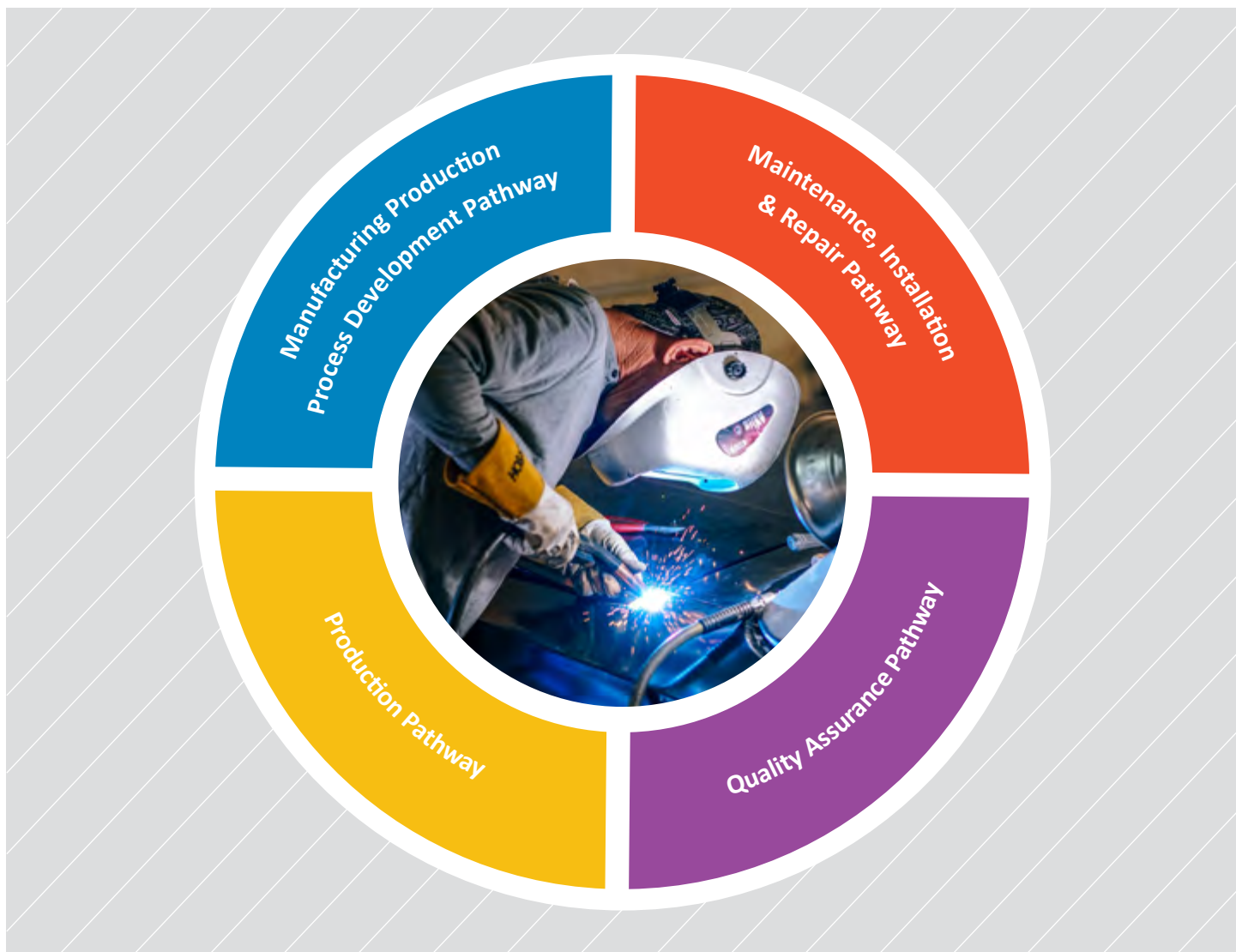
- Association for Manufacturing Technology
amtonline.org/index.cfm
- National Nanomanufacturing Network
internano.org
- Manufacturing Day
mfgday.com
- Biomanufacturing Training and Education Center
btec.ncsu.edu
- National Association of Manufacturers
nam.org
- SkillsUSA
skillsusa.org

Find more Manufacturing occupations at
onetonline.org/find/career?c=13



Core Skills

- Repairing
- Equipment Maintenance
- Installation
- Equipment Selection
- Troubleshooting
- Operation and Control
- Operation Monitoring
- Quality Control Analysis
- Technology Design
- Monitoring



MAINTENANCE, INSTALLATION & REPAIR PATHWAY

OCCUPATION

- **Installation, Maintenance, & Repair**
First-Line Supervisors of Mechanics, Installers, and Repairers; Computer, Automated Teller, and Office Machine Repairers; Radio, Cellular, and Tower Equipment Installers and Repairers; Radio Mechanics; Electric Motor, Power Tool, and Related Repairers; Electrical and Electronics Repairers, Commercial and Industrial Equipment; Electrical and Electronics Repairers, Powerhouse, Substation, and Relay; Electronic Home Entertainment Equipment Installers and Repairers; Security and Fire Alarm Systems Installers; Outdoor Power Equipment and Other Small Engine Mechanics; Home Appliance Repairers;

Industrial Machinery Mechanics; Maintenance Workers, Machinery; Camera and Photographic Equipment Repairers; Medical Equipment Repairers; Musical Instrument Repairers and Tuners; Watch Repairers; Maintenance and Repair Workers, General; Wind Turbine Service Technicians; Coin, Vending, and Amusement Machine Servicers and Repairers; Fabric Menders, Except Garment; Locksmiths and Safe Repairers; Geothermal Technicians

- **Production**
Medical Appliance Technicians



QUALITY ASSURANCE PATHWAY

OCCUP.

- **Office & Administrative Support**
Production, Planning, and Expediting Clerks; Weighers, Measurers, Checkers, and Samplers, Recordkeeping
- **Production**
Inspectors, Testers, Sorters, Samplers & Weighers

PRODUCTION PATHWAY

OCCUPATION

- **Transportation & Moving**
Machine Feeders and Offbearers
- **Production**
First-Line Supervisors of Production and Operating Workers; Aircraft Structure, Surfaces, Rigging, and Systems Assemblers; Coil Winders, Tapers, and Finishers; Electrical and Electronic Equipment Assemblers; Electromechanical Equipment Assemblers; Engine and Other Machine Assemblers; Fiberglass Laminators and Fabricators; Team Assemblers; Timing Device Assemblers and Adjusters; Butchers and Meat Cutters; Meat, Poultry, and Fish Cutters and Trimmers; Slaughterers and Meat Packers; Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders; Food Batchmakers; Food Cooking Machine Operators and Tenders; Computer-Controlled Machine Tool Operators, Metal and Plastic; Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic; Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic; Forging Machine Setters, Operators, and Tenders, Metal and Plastic; Rolling Machine Setters, Operators, and Tenders, Metal and Plastic; Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic; Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic; Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic; Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic; Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic; Machinists; Metal-Refining Furnace Operators and Tenders; Pourers and Casters, Metal; Model Makers, Metal and Plastic; Patternmakers, Metal and Plastic; Foundry Mold and Coremakers; Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic; Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic; Tool and Die Makers; Welders, Cutters, Solderers, and Brazers; Welders, Cutters, and Welder Fitters; Solderers and Brazers; Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders; Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic; Layout Workers, Metal and Plastic; Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic; Tool Grinders, Filers, and Sharpeners; Sewing Machine Operators; Shoe and Leather Workers and Repairers; Shoe Machine Operators and Tenders; Sewers, Hand; Textile Bleaching and Dyeing Machine Operators and Tenders; Textile Cutting Machine Setters, Operators, and Tenders; Textile Knitting and Weaving Machine Setters, Operators, and Tenders; Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders; Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers; Fabric and Apparel Patternmakers; Upholsterers; Cabinetmakers and Bench Carpenters; Furniture Finishers; Model Makers, Wood; Patternmakers, Wood; Sawing Machine Setters, Operators, and Tenders, Wood; Woodworking Machine Setters, Operators, and Tenders, Except Sawing; Nuclear Power Reactor Operators; Power Distributors and Dispatchers; Power Plant Operators; Chemical Plant and System Operators; Gas Plant Operators; Petroleum Pump System Operators, Refinery Operators, and Gaugers; Biofuels Processing Technicians; Methane/Landfill Gas Generation System Technicians; Biomass Plant Technicians; Hydroelectric Plant Technicians; Chemical Equipment Operators and Tenders; Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders; Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders; Grinding and Polishing Workers, Hand; Mixing and Blending Machine Setters, Operators, and Tenders; Cutters and Trimmers, Hand; Cutting and Slicing Machine Setters, Operators, and Tenders; Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders; Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders; Jewelers and Precious Stone and Metal Workers; Jewelers; Gem and Diamond Workers; Precious Metal Workers; Dental Laboratory Technicians; Ophthalmic Laboratory Technicians; Packaging and Filling Machine Operators and Tenders; Coating, Painting, and Spraying Machine Setters, Operators, and Tenders; Painters, Transportation Equipment; Painting, Coating, and Decorating Workers; Semiconductor Processors; Photographic Process Workers and Processing Machine Operators; Adhesive Bonding Machine Operators and Tenders; Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders; Cooling and Freezing Equipment Operators and Tenders; Etchers and Engravers; Molders, Shapers, and Casters, Except Metal and Plastic; Stone Cutters and Carvers, Manufacturing; Glass Blowers, Molders, Benders, and Finishers; Potters, Manufacturing; Molding and Casting Workers; Paper Goods Machine Setters, Operators, and Tenders; Tire Builders; Helpers—Production Workers; Recycling and Reclamation Workers

MANUFACTURING PRODUCTION PROCESS DEVELOPMENT PATHWAY

OCCUPATION

- **Architecture & Engineering**
Electrical and Electronics Drafters; Electronic Drafters; Electrical Drafters; Mechanical Drafters; Aerospace Engineering and Operations Technicians; Electrical and Electronic Engineering Technicians; Electronics Engineering Technicians; Electrical Engineering Technicians; Electro-Mechanical Technicians; Robotics Technicians; Industrial Engineering Technicians; Mechanical Engineering Technicians; Automotive Engineering Technicians; Non-Destructive Testing Specialists; Electrical Engineering Technologists; Electromechanical Engineering Technologists; Electronics Engineering Technologists; Industrial Engineering Technologists; Manufacturing Engineering Technologists; Mechanical Engineering Technologists; Photonics Technicians; Manufacturing Production Technicians; Fuel Cell Technicians; Nanotechnology Engineering Technologists; Nanotechnology Engineering Technicians
- **Life, Physical, & Social Science**
Chemical Technicians; Nuclear Technicians; Nuclear Equipment Operation Technicians; Nuclear Monitoring Technicians
- **Business & Financial Operations**
Purchasing Agents, Except Wholesale, Retail, & Farm Products



Selected Careers

| Occupation* | Job Description |
|---|--|
| Computer Numerically Controlled Machine Tool Programmers, Metal & Plastic | Make programs to control machining or processing of metal or plastic parts using automatic machine tools, equipment, or systems. |
| Computer-Controlled Machine Tool Operators, Metal & Plastic | Set up and operate machines that cut, shape, and form metal and plastic materials or pieces. |
| Dental Laboratory Technicians | Construct and repair full or partial dentures or dental appliances. |
| Electrical & Electronics Drafters | Develop specifications and instructions for installing electrical equipment that conducts electrical energy from transmission lines to consumers. Draw wiring diagrams, circuit board assembly diagrams, schematics, and layout drawings used for the manufacture, installation, and repair of electronic equipment. |
| Electrical & Electronics Engineering Technicians | Help engineers design and develop computers, communications equipment, medical monitoring devices, navigational equipment, and other electrical and electronic equipment. Often work in product evaluation and testing, using measuring and diagnostic devices to adjust, test, and repair equipment. |
| Electrical & Electronics Repairers, Commercial & Industrial Equipment | Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas. |
| First-Line Supervisors of Mechanics, Installers, & Repairers | Directly supervise and coordinate the work of mechanics, installers, and repairers. |
| First-Line Supervisors of Production & Operating Workers | Directly supervise and coordinate the activities of production and operating workers such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. |
| Industrial Engineering Technicians | Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. |
| Industrial Machinery Mechanics | Maintain and repair factory equipment and other industrial machinery like conveying systems, production machinery, and packaging equipment. |
| Machinists | Set up and operate a variety of machine tools to produce precision parts and instruments. May also fabricate and modify parts to make or repair machine tools or to maintain industrial machines. |
| Maintenance & Repair Workers, General | Fix and maintain machines, mechanical equipment, and buildings. Work on plumbing, electrical, and air-conditioning and heating systems. |
| Mechanical Engineering Technicians | Apply theory and principles of mechanical engineering to modify, develop, test, or calibrate machinery and equipment under the direction of engineering staff or physical scientists. |
| Medical Equipment Repairers | Install, maintain, and repair patient care equipment. |
| Production, Planning, & Expediting Clerks | Coordinate and advance the flow of work and materials within or between an establishment's departments according to a production schedule. |
| Purchasing Agents, Except Wholesale, Retail, & Farm Products | Buy machinery, equipment, tools, parts, supplies, or services necessary for the operation of an establishment. Purchase raw or semi-finished materials for manufacturing. |
| Security & Fire Alarm Systems Installers | Install, program, maintain, and repair security and fire alarm wiring and equipment. Ensure that work meets the requirements of relevant codes. |
| Welders, Cutters, Solderers, & Brazers | Use hand-welding or flame-cutting equipment to weld or join metal parts. Fill holes, indentations, or seams of metal products, using hand-held metal joining equipment. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--|------------------|----------------------------|--------------------------------|--|-----------------|
| Production | ★★★ | ★★★★★ | \$32,260 / \$44,620 | Postsecondary nondegree award, moderate-term on-the-job training | CIR |
| Production | ★★★★★ | ★★★★★ | \$28,480 / \$36,630 | High school diploma, moderate-term on-the-job training | RC |
| Production | ★★★ | ★★★★★ | \$27,230 / \$39,420 | High school diploma, moderate-term on-the-job training | RIC |
| Manufacturing Production Process Development | ★★ | ★★★★★ | \$36,400 / \$55,010 | Associate's degree | RIC |
| Manufacturing Production Process Development | ★★★★★ | ★★ | \$40,820 / \$59,660 | Associate's degree | RI |
| Maintenance, Installation & Repair | ★★★★★ | ★★ | \$34,390 / \$50,330 | Postsecondary nondegree award | RIC |
| Maintenance, Installation & Repair | ★★★★★ | ★★★★ | \$42,870 / \$61,610 | High school diploma or equivalent | ECR |
| Production | ★★★★★ | ★★ | \$38,200 / \$56,080 | High school diploma or equivalent | ERC |
| Manufacturing Production Process Development | ★★★ | ★★ | \$32,030 / \$46,790 | Associate's degree | IRC |
| Maintenance, Installation & Repair | ★★★★★ | ★★★★★ | \$32,550 / \$47,620 | High school diploma, long-term on-the-job training | RIC |
| Production | ★★★★★ | ★★★★★ | \$27,760 / \$39,390 | High school diploma, long-term on-the-job training | RCI |
| Maintenance, Installation & Repair | ★★★★★ | ★★★★ | \$25,650 / \$37,120 | High school diploma, long-term on-the-job training | RCI |
| Manufacturing Production Process Development | ★★ | ★★ | \$39,180 / \$51,590 | Associate's degree | RI |
| Maintenance, Installation & Repair | ★★★ | ★★★★★ | \$32,810 / \$47,120 | Associate's degree | RIC |
| Quality Assurance | ★★★★★ | ★★ | \$28,920 / \$41,610 | High school diploma, moderate-term on-the-job training | CE |
| Manufacturing Production Process Development | ★★★★★ | ★★ | \$40,600 / \$59,290 | Bachelor's degree | CE |
| Maintenance, Installation & Repair | ★★★★★ | ★★★★★ | \$30,540 / \$42,030 | High school diploma, moderate-term on-the-job training | RC |
| Production | ★★★★★ | ★★★★ | \$29,200 / \$38,460 | High school diploma, moderate-term on-the-job training | R |



Career Story



Antonio DePaz

Central Carolina Community College
A.A.S., Laser and Photonics Technology

While finishing Central Carolina Community College's Laser and Photonics Technology (LPT) program, Antonio DePaz was faced with the same problem many of the LPT graduates face, "Which job should I take?"

DePaz worked hard, and prepared well – and the offers came one after another. He was first given opportunities to stay local, but after much thought, he decided he wanted to explore opportunities in other parts of the country.

"I wouldn't be where I am at today without the support from my instructors and all of the CCCC staff."

So, for several weeks, Antonio flew around the country interviewing with a variety of companies. After much research and thought, DePaz accepted an offer from LSP

Technologies in Dublin, Ohio. LSP Technologies makes laser systems that are sold all over the world.

"The education I received from CCCC has helped me in my current job by exposing me to the work environment, real situations, tools, and lasers during most of my schooling that I now use at my job," says DePaz. "I learned more than enough to understand the language that is used in the laser field and that helps me a lot now to understand and learn new things easier."

DePaz notes that CCCC was a great and fun experience.

"I wouldn't be where I am at today without the support from my instructors and all of the CCCC staff," he says. "My advice to anyone interested in attending CCCC is that they will not regret it. Any program that you decide to be a part of will help to teach and prepare you for your future job. You will meet new people, make new friends, and you and your classmates will become a family, which will help you learn easier and better prepare you for your future job."



Tell Me
About...

PHOTONICS TECHNICIANS

Photonics technicians build, install, test, or maintain optical or fiber optic equipment, such as lasers, lenses, or mirrors, using spectrometers, interferometers, or related equipment. Their tasks may include the following:

- Maintain clean working environments, according to clean room standards
- Compute or record photonic test data
- Adjust or maintain equipment, such as lasers, laser systems, microscopes, oscilloscopes, and pulse generators
- Set up or operate assembly or processing equipment, such as lasers, cameras, die bonders, or optical spectrum analyzers
- Document procedures, such as calibration of optical or fiber optic equipment
- Perform diagnostic analyses of processing steps, using analytical or metrological tools

For more information about this occupation:

onetonline.org/





Marketing

Who helps form your first opinion of a business or other organization? First impressions count, so employees from cashiers to property managers serve as important marketers. Marketing also includes jobs that have a more obvious connection with marketing such as public relations specialists and merchandise displayers and window trimmers. The main goal of employees in this cluster is to help their organization reach its objectives.

Among North Carolina's occupations in this cluster with expected above average growth are: market research analysts; marketing managers; and wholesale and retail buyers. Retail salespersons top the list of occupations with the highest projected total job openings. While many workers in the Marketing cluster need a high school education, careers that require an associate's or bachelor's degree tend to have higher wages. Workplaces that are most likely to offer marketing positions include grocery stores, warehouse clubs, gasoline stations with convenience stores, home centers, and wholesale goods businesses.

The work environment for these occupations varies by job responsibilities. While some workers have desk jobs and regular weekday schedules, others will need to be on their feet most of the time. Work in marketing and advertising can involve long work hours with pressure to be creative within short time frames to meet deadlines. People who work in this industry need strong persuasive and customer service skills.

CAREER RESEARCH

- DECA
deca.org
- American Association of Advertising Agencies
aaaa.org
- International Association of Business Communicators
iabc.com
- Insights Association
insightsassociation.org

Find more Marketing occupations at
onetonline.org/find/career?c=14



Core Skills

- Management of Financial Resources
- Persuasion
- Negotiation
- Service Orientation
- Management of Material Resources
- Social Perceptiveness
- Speaking
- Active Listening
- Coordination
- Time Management



MERCHANDISING PATHWAY

OCCUP.

- Business & Financial Operations
Wholesale and Retail Buyers, Except Farm Products
- Sales & Related
Models
- Arts, Design, Entertainment, Sports, & Media
Merchandise Displayers and Window Trimmers



MARKETING MANAGEMENT PATHWAY

OCCUP.

- Management
Advertising and Promotions Managers; Green Marketers; Marketing Managers; Sales Managers; Public Relations and Fundraising Managers; Property, Real Estate, and Community Association Managers

PROFESSIONAL SALES PATHWAY

OCCUPATION

- Installation, Maintenance, & Repair
First-Line Supervisors of Retail Sales Workers; First-Line Supervisors of Non-Retail Sales Workers; Cashiers; Counter and Rental Clerks; Parts Salespersons; Retail Salespersons; Advertising Sales Agents; Energy Brokers; Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products; Solar Sales Representatives and Assessors; Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products; Demonstrators and Product Promoters; Real Estate Brokers; Real Estate Sales Agents; Sales Engineers; Telemarketers; Door-To-Door Sales Workers, News and Street Vendors, and Related Workers
- Transportation & Material Moving
Drivers/Sales Workers

MARKETING COMMUNICATIONS PATHWAY

OCCUP.

- Arts, Design, Entertainment, Sports, & Media
Public Relations Specialists

MARKETING RESEARCH PATHWAY

OCCUP.

- Business & Financial Operations
Market Research Analysts and Marketing Specialists





Selected Careers

| Occupation* | Job Description |
|--|---|
| Advertising & Promotions Managers | Plan programs to create interest in a product or service. Work with art directors, sales agents, and financial staff members. |
| Advertising Sales Agents | Sell or solicit advertising space, time, or media in publications, signage, TV, radio, or the Internet. |
| Demonstrators & Product Promoters | Demonstrate merchandise and answer questions for the purpose of creating public interest in buying the product. May sell demonstrated merchandise. |
| First-Line Supervisors of Non-Retail Sales Workers | Directly supervise and coordinate activities of sales workers other than retail sales workers. |
| First-Line Supervisors of Retail Sales Workers | Directly oversee and coordinate activities of retail sales workers in a business. May include work such as purchasing, budgeting, accounting, and personnel work in addition to supervisory duties. |
| Market Research Analysts & Marketing Specialists | Research market conditions in local, regional, or national areas. Gather information to predict product or service sales or to create a marketing campaign. |
| Marketing Managers | Plan, direct, and coordinate policies and programs that are designed to generate interest in a product or service. |
| Merchandise Displayers & Window Trimmers | Plan and erect commercial displays like those in windows and interiors of retail stores and at trade exhibitions. |
| Parts Salespersons | Sell spare and replacement parts and equipment in repair shops or parts stores. May help customers find the products they want and process customers' payments. |
| Property, Real Estate, & Community Association Managers | Oversee many aspects of residential, commercial, or industrial property care. Ensure that property is well maintained, operates smoothly, and keeps its resale value. |
| Public Relations & Fundraising Managers | Plan and direct creation of material to promote a positive public image for their employer or client. Coordinate campaigns that bring in donations for their organization. |
| Public Relations Specialists | Create and maintain a positive public image for the organization they represent. Design media releases to shape public opinion about their organization and to increase awareness of its work and goals. |
| Real Estate Brokers | Help clients buy, sell, and rent properties. Are licensed to manage their own real estate businesses. |
| Real Estate Sales Agents | Help clients buy, sell, and rent properties. Work with a real estate broker in this process. |
| Sales Engineers | Sell business goods or services that require a technical background equivalent to a bachelor's degree in engineering. |
| Sales Managers | Direct organizations' sales teams. Set sales goals, analyze data, and develop training programs for organizations' sales representatives. |
| Sales Representatives, Wholesale & Manufacturing, Except Technical & Scientific Products | Sell goods for wholesalers or manufacturers to businesses, government agencies, and other organizations. Contact customers, explain product features, answer any questions that their customers may have, and negotiate prices. |
| Sales Representatives, Wholesale & Manufacturing, Technical & Scientific Products | Sell goods for wholesalers or manufacturers using technical or scientific knowledge in subjects like biology, engineering, chemistry, or electronics. |
| Wholesale & Retail Buyers, Except Farm Products | Buy products for organizations to use or resell. Evaluate suppliers, negotiate contracts, and review product quality. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--------------------------|------------------|----------------------------|--------------------------------|--|-----------------|
| Marketing Management | ★★ | ★★★★ | \$68,640 / \$117,220 | Bachelor's degree | EAC |
| Professional Sales | ★★★★★ | ★ | \$27,970 / \$46,880 | High school diploma, moderate-term on-the-job training | ECA |
| Professional Sales | ★★★★★ | ★★★★ | \$17,720 / \$22,870 | High school diploma, short-term on-the-job training | ECR |
| Professional Sales | ★★★★★ | ★★★★ | \$52,230 / \$83,970 | High school diploma or equivalent | ECS |
| Professional Sales | ★★★★★ | ★★★★ | \$26,850 / \$38,710 | High school diploma or equivalent | ECS |
| Marketing Research | ★★★★★ | ★★★★★ | \$39,160 / \$61,330 | Bachelor's degree | IEC |
| Marketing Management | ★★★★★ | ★★★★★ | \$84,280 / \$129,670 | Bachelor's degree | EC |
| Merchandising | ★★★ | ★★ | \$19,290 / \$26,850 | Short-term on-the-job training | AER |
| Professional Sales | ★★★★★ | ★★★★ | \$19,540 / \$29,460 | No formal educational credential | ECR |
| Marketing Management | ★★★★★ | ★★★★ | \$41,130 / \$58,800 | High school diploma or equivalent | EC |
| Marketing Management | ★★★ | ★★★★ | \$73,870 / \$107,700 | Bachelor's degree | EA |
| Marketing Communications | ★★★★★ | ★★★★ | \$38,900 / \$55,740 | Bachelor's degree | EAS |
| Professional Sales | ★★★★★ | ★★★★ | \$24,530 / \$39,100 | High school diploma or equivalent | EC |
| Professional Sales | ★★★★★ | ★★★★ | \$25,100 / \$47,030 | High school diploma, moderate-term on-the-job training | EC |
| Professional Sales | ★★★★★ | ★★ | \$56,690 / \$90,820 | Bachelor's degree | ERI |
| Marketing Management | ★★★★★ | ★★★★ | \$73,050 / \$125,100 | Bachelor's degree | EC |
| Professional Sales | ★★★★★ | ★★★★ | \$33,370 / \$59,400 | High school diploma, moderate-term on-the-job training | CE |
| Professional Sales | ★★★★★ | ★★★★ | \$48,050 / \$85,040 | Bachelor's degree | EC |
| Merchandising | ★★★★★ | ★★★★ | \$35,630 / \$53,380 | Bachelor's degree | EC |



Career Story



Jackson Lancaster

Beaufort County Community College
Associate in Arts

Besides getting a great education, Jackson Lancaster received countless honors at Beaufort County Community College. Now Coldwell Banker has named Lancaster one of its “30 Under 30” real estate brokers.

Coldwell Banker has named Lancaster one of its “30 Under 30” real estate brokers.

The rising star graduated from the Early College High School at BCCC in 2015. The program allows students to finish after five years with both an associate degree and a high school diploma. At the end of his fifth year he started taking real estate courses to get licensed. The business student moved immediately into working on a Bachelor of Arts in Business Administration at ECU while working as a broker at Coldwell Banker.

While at BCCC, Lancaster served as president of the Student Government Association and was an ambassador for the BCCC Foundation. As the SGA president, he was also an ex-officio member of the BCCC Board of Trustees.

These initial contacts from BCCC helped Lancaster get started, along with skills he acquired at the college. His involvement in clubs increased his social connections. Though Lancaster has wanted to be a real estate broker since he was eight years old, BCCC faculty helped him to focus on his career path.

When Lancaster stepped outside of the college into the professional world, it was not an easy transition.

“It was difficult because people didn't take me seriously,” he said.

His first listing was from a BCCC staff member. After his initial success, recommendations started coming in, and other former teachers started using his services. His excitement, optimism, and use of social media has kept clients coming in. They see that he is willing to go out of his way to help make a sale.



Tell Me About...

REAL ESTATE BROKERS

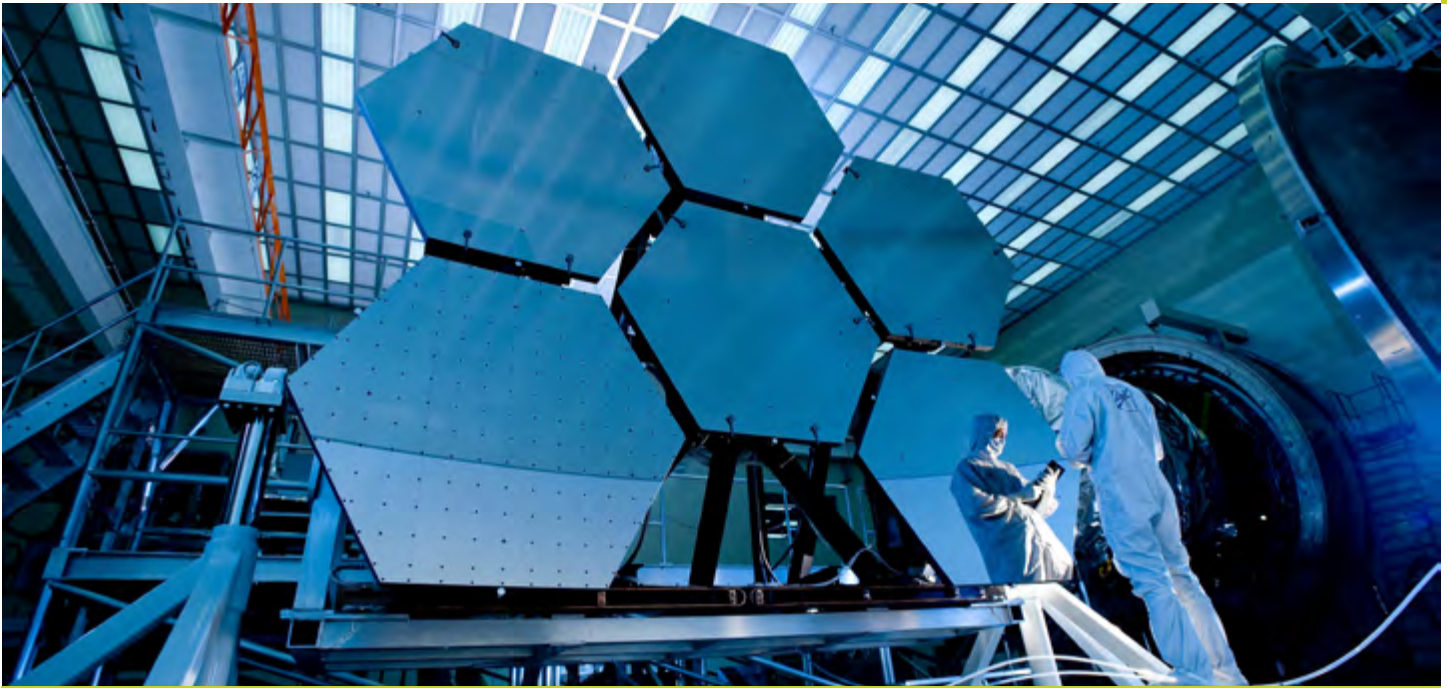
Real estate brokers help clients buy, sell, and rent properties. Although brokers and real estate sales agents do similar work, brokers are licensed to manage their own real estate businesses. They typically do the following:

- Solicit potential clients to buy, sell, and rent properties
- Advise clients about prices, mortgages, market conditions, and other related information
- Compare properties to determine a competitive market price
- Make lists of properties for sale, including details such as location and features
- Promote properties through advertisements, open houses, and listing services

For more information about this career and 560 other occupations:

nccareers.org/occupationalprofiles/index.html





Science, Technology, Engineering & Mathematics

What do occupations in the Science, Technology, Engineering & Mathematics (STEM) career cluster have in common? Workers in these careers use scientific, technological, engineering, and/or mathematical processes to do research and solve problems. The problems they approach are as different as reducing our reliance on fossil fuels, developing medicines to treat mental illness, and estimating the economic impact of government policy changes. Their research can be as small as a nanoparticle or as large as the universe.

Work settings vary with the topic of STEM research. While some jobs take place in front of a computer or in a laboratory, others require people to work in outdoor environments. Schedules also depend on the focus of STEM workers' research. Some individuals have very regular hours, but others' schedules depend upon availability of the subject they analyze. Employers who are likely to hire STEM qualified workers include engineering companies; the federal, state, and local government; scientific research companies; colleges and universities; and drug manufacturers.

More than any of the other clusters, many STEM careers require at least an associate's degree or higher. Most require a bachelor's degree, and some workers need master's or doctoral-level credentials. Typical educational backgrounds for entry into five occupations that are projected to have the highest total number of openings over the next ten years in North Carolina include:

- Mechanical Engineers – Bachelor's degree
- Industrial Engineers – Bachelor's degree
- Environmental Scientists and Specialists – Bachelor's degree
- Architectural and Engineering Managers – Bachelor's degree
- Electrical Engineers – Bachelor's degree

CAREER RESEARCH

- American Geosciences Institute
americangeosciences.org
- Society for Industrial and Applied Mathematics
siam.org
- National Oceanic and Atmospheric Administration
noaa.gov
- North Carolina Biotechnology Center
ncbcjobs.ncbiotech.org
- Careers in Math
coolmath.com/careers
- New Scientist (International)
newscientist.com
- Institute of Electrical and Electronics Engineers
jobs.ieee.org
- National Science Foundation
nsf.gov
- Technology Student Association
tsaweb.org

Find more Science, Technology, Engineering & Mathematics occupations at oneline.org/find/career?c=15



Core Skills

- Science
- Programming
- Technology Design
- Operations Analysis
- Mathematics
- Systems Analysis
- Systems Evaluation
- Writing
- Complex Problem Solving
- Management of Financial Resources



ENGINEERING & TECHNOLOGY PATHWAY

OCCUPATION

- **Architecture & Engineering**
Aerospace Engineers; Chemical Engineers; Computer Hardware Engineers; Electrical Engineers; Electronics Engineers, Except Computer; Radio Frequency Identification Device Specialists; Health and Safety Engineers, Except Mining Safety Engineers and Inspectors; Industrial Safety and Health Engineers; Fire-Prevention and Protection Engineers; Product Safety Engineers; Industrial Engineers; Human Factors Engineers and Ergonomists; Marine Engineers and Naval Architects; Marine Engineers; Marine Architects; Materials Engineers; Mechanical Engineers; Fuel Cell Engineers; Automotive Engineers; Mining and Geological Engineers, Including Mining Safety Engineers; Nuclear Engineers; Petroleum Engineers; Biochemical Engineers; Validation Engineers; Energy Engineers; Manufacturing Engineers; Mechatronics Engineers; Microsystems Engineers; Photonics Engineers; Robotics Engineers; Nanosystems Engineers; Wind Energy Engineers; Solar Energy Systems Engineers
- **Management**
Architectural and Engineering Managers; Biofuels/Biodiesel Technology and Product Development Managers



SCIENCE & MATHEMATICS PATHWAY

OCCUPATION

- **Computer & Mathematical**
Computer and Information Research Scientists; Mathematicians; Statisticians; Biostatisticians; Clinical Data Managers; Mathematical Technicians
- **Architecture & Engineering**
Cartographers & Photogrammetrists
- **Life, Physical & Social Science**
Biochemists and Biophysicists; Microbiologists; Bioinformatics Scientists; Molecular and Cellular Biologists; Geneticists; Conservation Scientists; Soil and Water Conservationists; Range Managers; Park Naturalists; Astronomers; Physicists; Atmospheric and Space Scientists; Chemists; Materials Scientists; Environmental Scientists and Specialists, Including Health; Climate Change Analysts; Environmental Restoration Planners; Industrial Ecologists; Geoscientists, Except Hydrologists and Geographers; Hydrologists; Remote Sensing Scientists and Technologists; Economists; Environmental Economists; Survey Researchers; Sociologists; Anthropologists; Archeologists; Geographers; Historians; Political Scientists; Transportation Planners; Social Science Research Assistants; City and Regional Planning Aides; Quality Control Analysts; Precision Agriculture Technicians; Remote Sensing Technicians



Occupations can be classified in a variety of ways.

Science, Technology, Engineering & Mathematics, better known as STEM, means different things to different people. Since this guide focuses on career clusters, these two pathway pages include approximately 90 occupations “officially” listed in the STEM cluster. On the other hand, by visiting the Find Occupations item at O*NET Online, you'll discover a separate STEM category that includes more than 300 occupations. [onetonline.org/find/stem?t=0](https://onlinenone.org/find/stem?t=0)



Did You Know...



Selected Careers

| Occupation* | Job Description |
|--|--|
| Aerospace Engineers | Perform engineering duties involved in designing, building, and testing aircraft, missiles, and spacecraft. May conduct basic and applied research to evaluate adaptability of materials and equipment to aircraft design and manufacture. |
| Architectural & Engineering Managers | Plan, direct, or coordinate activities in fields such as architecture and engineering or research and development. |
| Biochemists & Biophysicists | Study the chemical or physical principles of living things and biological processes like cell development, growth, and heredity. |
| Cartographers & Photogrammetrists | Collect, measure, and interpret geographic information to create maps and charts for political, educational, and other purposes. |
| Chemical Engineers | Apply the principles of chemistry, biology, physics, and mathematics to solve problems involved in producing many products. Design processes, test methods, and design equipment for large-scale manufacturing production. |
| Chemists | Study substances at the atomic and molecular levels and the ways in which substances react with each other. Use chemistry knowledge for quality control and new product development. |
| Computer Hardware Engineers | Research, design, develop, or test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacture and installation of computer or computer-related equipment and components. |
| Conservation Scientists | Manage, improve, and protect natural resources like forests, parks, and rangelands, maximizing their use without damaging the environment. |
| Electrical Engineers | Design, develop, test, and supervise the manufacture of electrical equipment like electric motors, radar and navigation systems, communications systems, or power generation equipment. May design the electrical systems of automobiles and aircraft. |
| Electronics Engineers, Except Computer | Design and develop electronic equipment such as broadcast and communications systems, ranging from portable music players to global positioning systems (GPS). May also work in areas closely related to computer hardware. |
| Environmental Scientists & Specialists, Including Health | Use knowledge of the natural sciences to protect the environment and human health. May clean up polluted areas, advise policy makers, or work with industry to reduce waste. |
| Geoscientists, Except Hydrologists & Geographers | Study the Earth's composition, structure, and processes to learn about its past, present, and future. |
| Health & Safety Engineers, Except Mining Safety Engineers & Inspectors | Plan, implement, and coordinate safety programs using knowledge of health or safety and systems engineering. Develop procedures and design systems to keep people from getting sick or injured and to keep property from being damaged. |
| Industrial Engineers | Design, develop, test, and evaluate integrated systems for managing industrial production processes, including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. |
| Mechanical Engineers | Research, design, develop, build, and test mechanical and thermal devices such as tools, engines, machines, and heating systems. May also oversee installation, operation, maintenance, and repair of equipment like gas, water, and steam systems. |
| Social Science Research Assistants | Help social scientists with laboratory, survey, and other social science research. |
| Statisticians | Use statistical methods to collect and analyze data and help solve real-world problems in business, engineering, the sciences, or other fields. |
| Survey Researchers | Plan, develop, or conduct surveys. They may analyze and interpret the meaning of survey data, determine survey objectives, or suggest or test question wording. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--------------------------|------------------|----------------------------|--------------------------------|---------------------------------|-----------------|
| Engineering & Technology | ★★ | ★★ | \$67,400 / \$98,060 | Bachelor's degree | IR |
| Engineering & Technology | ★★★★ | ★★★ | \$95,590 / \$127,350 | Bachelor's degree | ERI |
| Science & Mathematics | ★★★ | ★★★ | \$56,710 / \$85,230 | Doctoral or professional degree | IAR |
| Science & Mathematics | ★★★ | ★★★★★ | \$41,730 / \$57,220 | Bachelor's degree | RIC |
| Engineering & Technology | ★★ | ★★ | \$66,610 / \$87,480 | Bachelor's degree | IR |
| Science & Mathematics | ★★★★ | ★★★ | \$45,390 / \$68,100 | Bachelor's degree | IRC |
| Engineering & Technology | ★★★ | ★★★ | \$68,200 / \$10,2230 | Bachelor's degree | IRC |
| Science & Mathematics | ★★ | ★★★★ | \$38,270 / \$55,540 | Bachelor's degree | R |
| Engineering & Technology | ★★★★ | ★★ | \$67,160 / \$96,940 | Bachelor's degree | IR |
| Engineering & Technology | ★★★ | ★★ | \$66,570 / \$92,920 | Bachelor's degree | IR |
| Science & Mathematics | ★★★★ | ★★★★ | \$43,050 / \$57,780 | Bachelor's degree | IRC |
| Science & Mathematics | ★★ | ★★★★ | \$57,190 / \$73,960 | Bachelor's degree | IR |
| Engineering & Technology | ★★ | ★★★★ | \$52,480 / \$74,910 | Bachelor's degree | IR |
| Engineering & Technology | ★★★★ | ★★ | \$60,770 / \$81,690 | Bachelor's degree | ICE |
| Engineering & Technology | ★★★★ | ★★★ | \$58,820 / \$80,410 | Bachelor's degree | IRC |
| Science & Mathematics | ★★★ | ★★ | \$31,520 / \$40,620 | Bachelor's degree | CI |
| Science & Mathematics | ★★★ | ★★★★★ | \$64,590 / \$98,320 | Master's degree | CI |
| Science & Mathematics | ★★ | ★★★★★ | \$39,260 / \$68,450 | Master's degree | ICE |



Career Story



Syreeta Lynn

Durham Technical Community College
A.A.S., Clinical Trials Research Associate

Prior to enrolling in the Clinical Trials Research Associate program at Durham Technical Community College, Syreeta Lynn worked in an entry-level call center position at a pharmaceutical research organization. Just two weeks on the job, the supervisor recognized her potential and offered her a promotion as an In-House Clinical Research Associate.

“Durham Tech gave me the clinical research foundation that I needed to hit the ground running,” Lynn said. “The Clinical Trials program was a life-changer. Though I was in the industry before I came to Durham Tech, I wouldn’t have been able to sustain a career in the industry without this degree.”

While at Durham Tech, an internship with PharmaLinkFHI (now Novella Clinical) led to an offer for permanent, full-time employment.

“Durham Tech gave me the clinical research foundation that I needed to hit the ground running,”

“You must have a willingness and a capability to learn to succeed,” Lynn says of her advice to future students. “You can’t be willing, but not be capable or be capable, but not be willing—you must have both.”

“It was unheard of for someone with only a high school diploma to be offered that position,” Lynn said. “I started doing the work, and I absolutely loved it.”

“Without this degree, my life would be a struggle,” Lynn states. “Durham Tech is a hidden treasure and the Clinical Trials program has totally changed my life. For those reasons, I will always be indebted to Durham Tech.”

As soon as Lynn started the new position, she began looking for educational opportunities to advance in the industry. She chose Durham Tech because it was the only school in the area that had a two-year program for clinical trials.



Tell Me About...

CLINICAL RESEARCH COORDINATORS

Clinical research coordinators plan, direct, or coordinate clinical research projects. They oversee the activities of workers engaged in clinical research projects to make sure that protocols are followed and that overall clinical objectives are met. Clinical research coordinators may also evaluate and analyze clinical data.

For more information about this occupation:

onetonline.org/





Transportation, Distribution & Logistics

Transportation keeps our economy, people, and products moving. Occupations involved in transporting, distributing, and coordinating the movement of goods range from airline pilots to mechanics to logisticians. Additionally, this cluster includes occupations related to warehouse storage, including jobs like cargo and freight agents and non-emergency dispatchers.

Most of this career cluster's activities take place on the ground via highways and railroads, but the cluster also includes workers who move people and products over the water and through the air. Work environments vary by occupation. While some truck drivers may work long hours and travel long distances, people who work in warehouses are more likely to work eight-hour shifts. Physical strength is necessary for some jobs, while word processing and spreadsheet skills are priorities in others.

For the Transportation, Distribution and Logistics career cluster, the greatest number of new jobs in North Carolina are projected to include heavy and tractor-trailer truck drivers; laborers, and freight stock, and material movers; hand packers and packagers; and automotive service technicians and mechanics. Many jobs require a high school education, but postsecondary education – usually no higher than a bachelor's degree – is needed for some occupations. Workers often find jobs in temporary service agencies, long distance freight trucking businesses, new car dealerships, warehouse and storage facilities, or express delivery companies.

CAREER RESEARCH

- American Trucking Associations trucking.org
- Global Cold Chain Alliance gcca.org
- Taxicab, Limousine and Paratransit Association tla.org
- Association of American Railroads aar.org
- Airlines for America airlines.org
- Jobs in Motion jobsinmotion.com
- SkillsUSA skillsusa.org

Find more Transportation, Distribution & Logistics occupations at onetonline.org/find/career?c=16



Core Skills

- Repairing
- Equipment Maintenance
- Operation and Control
- Installation
- Troubleshooting
- Operation Monitoring
- Equipment Selection
- Quality Control Analysis
- Time Management
- Coordination



TRANSPORTATION SYSTEMS/INFRASTRUCTURE PLANNING, MANAGEMENT & REGULATION PATHWAY

OCCUP.

- Transportation & Material Moving
Air Traffic Controllers; Airfield Operations Specialists; Traffic Technicians



LOGISTICS PLANNING & MANAGEMENT SERVICES PATHWAY

OCCUP.

- **Management**
Transportation, Storage, and Distribution Managers; Transportation Managers; Storage and Distribution Managers; Logistics Managers
- **Office & Administrative Support**
Dispatchers, Except Police, Fire & Ambulance
- **Business & Financial Operations**
Logisticians; Logistics Engineers; Logistics Analysts

SALES & SERVICE PATHWAY

OCCUP.

- **Office & Administrative Support**
Billing and Posting Clerks; Statement Clerks; Billing, Cost, and Rate Clerks; Cargo and Freight Agents; Freight Forwarders
- **Transportation & Material Moving**
Parking Lot Attendants

TRANSPORTATION OPERATIONS PATHWAY

OCCUPATION

- **Office & Administrative Support**
Couriers and Messengers
- **Transportation & Material Moving**
Aircraft Cargo Handling Supervisors; First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand; Recycling Coordinators; First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators; Airline Pilots, Copilots, and Flight Engineers; Commercial Pilots; Flight Attendants; Ambulance Drivers and Attendants, Except Emergency Medical Technicians; Bus Drivers, Transit and Intercity; Bus Drivers, School or Special Client; Heavy and Tractor-Trailer Truck Drivers; Light Truck or Delivery Services Drivers; Taxi Drivers and Chauffeurs; Locomotive Engineers; Locomotive Firers; Rail Yard Engineers, Dinkey Operators, and Hostlers; Railroad Brake, Signal, and Switch Operators; Railroad Conductors and Yardmasters; Subway and Streetcar Operators; Sailors and Marine Oilers; Captains, Mates, and Pilots of Water Vessels; Ship and Boat Captains; Mates- Ship, Boat, and Barge; Pilots, Ship; Motorboat Operators; Ship Engineers; Bridge and Lock Tenders; Transportation Attendants, Except Flight Attendants; Industrial Truck and Tractor Operators; Laborers and Freight, Stock, and Material Movers, Hand; Packers and Packagers, Hand; Gas Compressor and Gas Pumping Station Operators; Pump Operators, Except Wellhead Pumps; Wellhead Pumpers; Mine Shuttle Car Operators; Tank Car, Truck, and Ship Loaders

FACILITY & MOBILE EQUIPMENT MAINTENANCE PATHWAY

OCCUPATION

- **Construction & Extraction**
Rail-Track Laying and Maintenance Equipment Operators
- **Transportation & Material Moving**
Automotive and Watercraft Service Attendants; Cleaners of Vehicles and Equipment
- **Installation, Maintenance, & Repair**
Avionics Technicians; Electrical and Electronics Installers and Repairers, Transportation Equipment; Electronic Equipment Installers and Repairers, Motor Vehicles; Aircraft Mechanics and Service Technicians; 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; Mobile Heavy Equipment Mechanics, Except Engines; Rail Car Repairers; Motorboat Mechanics and Service Technicians; Motorcycle Mechanics; Bicycle Repairers; Recreational Vehicle Service Technicians; Tire Repairers and Changers; Signal and Track Switch Repairers





Selected Careers

| Occupation* | Job Description |
|--|--|
| Air Traffic Controllers | Control air traffic on and within the vicinity of airports and movement of air traffic between altitude sectors and control centers according to established procedures and policies. |
| Aircraft Mechanics & Service Technicians | Repair and perform scheduled maintenance on aircraft. Perform aircraft inspections as required by the Federal Aviation Administration (FAA). |
| Airline Pilots, Copilots, & Flight Engineers | Pilot and navigate the flight of fixed-wing, multi-engine aircraft, usually on scheduled air carrier routes. Transport passengers and cargo. |
| Ambulance Drivers & Attendants, Except EMTs | Drive ambulances or help ambulance drivers transport people who are sick, injured, or recovering from illness or injury. |
| Automotive Body & Related Repairers | Repair and refinish automotive vehicle bodies and straighten vehicle frames. |
| Automotive Service Technicians & Mechanics | Inspect, maintain, and repair cars and light trucks. |
| Avionics Technicians | Install, inspect, test, adjust, or repair avionics equipment such as radar, radio, navigation, and missile control systems in aircraft or space vehicles. |
| Billing & Posting Clerks | Do administrative work for many types of organizations. Keep records, help customers, and carry out financial transactions. |
| Bus & Truck Mechanics & Diesel Engine Specialists | Inspect, repair, or overhaul buses, trucks, and anything else with a diesel engine. |
| Bus Drivers, Transit & Intercity | Transport people between locations like workplaces, shopping malls, and across state and national borders. Drive regular routes, and others transport passengers on chartered trips or sightseeing tours. |
| Cargo & Freight Agents | Expedite and route incoming and outgoing cargo and freight in airline, train, and trucking terminals, and on shipping docks. Take orders from customers and help determine shipping charges and tariffs. |
| Commercial Pilots | Fly and navigate airplanes, helicopters, and other aircraft. May provide charter flights, rescue operations, firefighting support, aerial photography, and aerial application of agricultural materials. |
| First-Line Supervisors of Helpers, Laborers, & Material Movers, Hand | Directly supervise and coordinate the activities of helpers, laborers, or material movers. |
| First-Line Supervisors of Transportation & Material-Moving Machine & Vehicle Operators | Directly supervise and coordinate activities of transportation and material-moving machine and vehicle operators and helpers. |
| Heavy & Tractor-Trailer Truck Drivers | Transport goods from one location to another. Deliver goods between cities and sometimes between states. Most are long-haul drivers whose trucks can carry more than 26,000 pounds. |
| Logisticians | Analyze and coordinate an organization's supply chain, the process that moves a product from supplier to consumer. Manage the entire life cycle of a product, including how a product is obtained, distributed, assigned, and delivered. |
| Mobile Heavy Equipment Mechanics, Except Engines | Inspect, maintain, and repair vehicles and machinery like the cranes, bulldozers, and graders used in construction, farming, rail transportation, surface mining, and other industries. |
| Motorcycle Mechanics | Diagnose, adjust, repair, or overhaul motorcycles, scooters, mopeds, dirt bikes, or similar motorized vehicles. |
| Transportation, Storage, & Distribution Managers | Plan, direct, or coordinate transportation, storage, or distribution operations within an organization. May also oversee activities of businesses that provide these services. |



* See data sources and notes about Selected Careers on page 118.

| Career Pathway | 10-Year Openings | NC Annualized Growth Rate* | Annual Entry/ Median Wages* | Minimum Education* | Interest Areas* |
|--|------------------|----------------------------|--------------------------------|---|-----------------|
| Transportation Systems/ Infrastructure Planning, Management & Regulation | ★★ | ★★ | \$72,320 / \$91,490 | Associate's degree | EC |
| Facility & Mobile Equipment Maintenance | ★★★★★ | ★★★★ | \$40,440 / \$54,970 | Postsecondary nondegree award | RCI |
| Transportation Operations | ★★★★★ | ★★ | \$72,780 / \$94,980 | Bachelor's degree | RCI |
| Transportation Operations | ★★ | ★★★★★★ | \$22,880 / \$30,230 | High school diploma, moderate-term on- the-job training | RS |
| Facility & Mobile Equipment Maintenance | ★★★★★ | ★★★★ | \$30,310 / \$46,930 | High school diploma, long-term on-the-job training | R |
| Facility & Mobile Equipment Maintenance | ★★★★★★ | ★★★★ | \$23,260 / \$37,720 | Postsecondary nondegree award | RI |
| Facility & Mobile Equipment Maintenance | ★★ | ★★★★ | \$42,660 / \$55,950 | Associate's degree | RIC |
| Sales & Service | ★★★★★★ | ★★★★★ | \$26,350 / \$34,730 | High school diploma, moderate-term on- the-job training | CE |
| Facility & Mobile Equipment Maintenance | ★★★★★★ | ★★★★★ | \$30,760 / \$41,690 | High school diploma, long-term on-the-job training | RC |
| Transportation Operations | ★★★★★ | ★★★★★ | \$20,560 / \$28,300 | High school diploma, moderate-term on- the-job training | RS |
| Sales & Service | ★★★★ | ★★★★★ | \$26,580 / \$39,220 | High school diploma, short-term on-the- job training | CER |
| Transportation Operations | ★★★★ | ★★★★★ | \$44,890 / \$72,710 | High school diploma, moderate-term on- the-job training | RIE |
| Transportation Operations | ★★★★★★ | ★★ | \$32,770 / \$46,400 | High school diploma or equivalent | ERC |
| Transportation Operations | ★★★★★★ | ★★ | \$38,870 / \$52,330 | High school diploma or equivalent | ECR |
| Transportation Operations | ★★★★★★ | ★★★★ | \$27,740 / \$39,410 | Postsecondary nondegree award | RC |
| Logistics Planning & Management Services | ★★★★★ | ★★★★ | \$49,780 / \$71,300 | Bachelor's degree | EC |
| Facility & Mobile Equipment Maintenance | ★★★★★ | ★★★★ | \$32,410 / \$43,570 | High school diploma, long-term on-the-job training | RC |
| Facility & Mobile Equipment Maintenance | ★★ | ★★★★ | \$25,040 / \$33,830 | Postsecondary nondegree award | R |
| Logistics Planning & Management Services | ★★★★ | ★★★★ | \$64,610 / \$93,260 | High school diploma or equivalent | EC |



Career Story



Noah Wiggins

Lenoir Community College

Automotive Systems Technology Instructor

With 17 years of experience in the automotive field, a high school diploma, and an Associate degree in Automotive Systems Technology, Noah Wiggins landed a teaching job back where he earned his degree at Lenoir Community College.

“I wanted to help provide the industry with well-equipped, entry-level technicians,”

For years, Wiggins had entertained the idea of teaching what he had learned in his work. One reason for considering this option was that training others was part of his job duties while still working as an automotive technician.

“This helped me realize I wanted to help provide the industry with well-equipped, entry-level technicians,” he says.

Now he develops lesson plans and provides instruction in the classroom as well as in the lab.

“What I like most about my job is to see a student have that ‘light bulb’ moment and realize that I have played a role in their understanding of automotive technology,” he declares. “I also really enjoy spending the workday with great fellow employees.”

Prior to coming to LCC, Wiggins spent five years providing various automotive services ranging from routine maintenance to parts counter duties. He earned certifications as a Nissan Master Certified Technician and as a Toyota Expert Technician.

Wiggins says that learning how to manage his time and developing his soft skills have prepared him most for his current position.

“Those areas allow me to be able to easily relate to students and staff. I also participated in work-based learning, which allowed me to gain valuable on the job training to better be able to apply what I was learning in the classroom.”

While Wiggins was unable to participate in SkillsUSA as a student years ago, he now participates as an event leader.

“I would have welcomed the opportunity back then, and I encourage students to participate in outside organizations to hone the skills they learn in the classroom.”

Looking back over his time in the automotive field, Wiggins said the industry changes from year to year.

“Some of the biggest changes have to do with new technology that gives the driver more information,” he said. “What that has meant for me as a technician is that I have to update my training every year to retain my certification and to be able to keep up with technology as it is produced.”

The best advice Wiggins offers to students is to always be on time and maintain good attendance.

“Be professional,” he adds. “Never stop learning and never stop expanding your skill set.”



Prepare for Work

Whether you're exploring careers or thinking about your next job, you'll have questions about how you can get there (to a career) from here. You can factor in varied options for mapping your occupational route. In addition to education, jobs, and volunteer experiences that you've already had, check out these ways to get ready for work.

Experiencing Real Jobs

You can jump start your future career by “trying out” an occupation through work-based learning programs like those listed below. Your local school or college will offer some of these programs, and you can also seek out these opportunities online and by contacting community businesses and organizations.

Job Shadowing programs usually involve going to work for one or several days with someone whose career interests you. You can observe tasks and skills required for the job, experience the work environment, and interact with people who currently work in your potential career field.

Internships and Cooperative Education experiences usually last from a couple of weeks to several months. You observe individuals in your career field of interest while performing some of the job's tasks and duties. Internships and Cooperative Education include mentoring by an experienced career professional who can discuss your career decisions and goals. Internships can be paid or unpaid, but Cooperative Education must provide pay. Either program may be eligible for academic credit at a high school or college.

School-Based Enterprises allow you to plan and run a simulated or actual business at school. It provides direct links between what you learn in the classroom and what it's like to work in an actual job.

Apprenticeships offer combined academic instruction, structured training, and paid work experience that usually lasts for three to four years. Employers offer these programs in collaboration with the North Carolina Community College System.

Service Learning can be a great way to learn about a career and help your community while developing new skills or applying existing skills. You will see how the services you provide connect with what you've learned in classes.

Business/Industry Field Trips are opportunities to leave the classroom to see how what you've learned applies in workplaces. You can observe and investigate activities that relate to a specific school subject and to your career plans.

Work-based learning experiences give you the edge when applying for new jobs. You'll gain valuable work experience and meet people who can become part of your career network. They may be your best resource for meeting potential employers and other people who can provide job referrals. These experiences can also improve the quality of your resume!

Work-Based Learning Stories



Michael Johnson

Pipefitter/Welder

Pipefitter Apprenticeship Program

At age 25, Michael Johnson left his factory job making pocket knives and enlisted in the United States Army as an Allied Trades Specialist. After seven years in the Army, where he was deployed over-seas for many years, he decided to leave the Army and start a family.

"The Registered Apprenticeship program pushed me to become a pipefitter and learn all aspects of that trade."

Michael learned of a program called the Veterans in Piping (VIP), a partnership with The United Association of Plumbers and Pipefitters and the Military. After five months in the VIP program, he earned five different x-ray welding certifications.

Then Michael started a Pipefitter Apprenticeship program through Mechanical Trades Carolinas, in association with Rowan-Cabarrus Community College and became a Journeyman Pipefitter/Welder.

"The Registered Apprenticeship program pushed me to become a pipefitter and learn all aspects of that trade. All the training through Mechanical Trades Carolina and Rowan-Cabarrus Community College, plus lots of on-the-job experience in the field, taught me how to successfully do just that."

When he is not welding pipes, Michael enjoys his free time with his spouse and two daughters.



Did You Know...

The advantages of apprenticeship

Registered Apprenticeships offer advantages for both job seekers and employers – a true win-win situation. You get to learn skills that an employer needs, and the employer gets a qualified worker. A few other benefits:

- You earn a paycheck that gradually increases as you learn new skills.
- In addition to providing hands-on training, your employer may pay for you to earn college credit.
- Your employer may hire you after you've successfully completed your apprenticeship.
- You may receive an industry certification that you can use anywhere in the country.

For more information about apprenticeships:

nccommunitycolleges.edu/apprenticeshipnc



Work-Based Learning Stories



Nick Dasnoit

Information Technology

Opportunity Greensboro Fellows Program

Photo credit Carrie Lilly

By Aleasha Vuncannon

Nick Dasnoit ('17) knew he wanted to major in Information Technology. It appealed to him as a stable and growing industry.

"I had always been interested in technology in some form, even in my previous line of work," said Dasnoit.

He also knew he wanted to pursue his degree at Guilford Technical Community College.

"I had taken classes at GTCC previously and was familiar with the college already. I liked the atmosphere, and it was more affordable," he said. "I feel like the education is on par with a four-year university."

"I was motivated from day one because of what the program had to offer."

While Nick was completing his final year at GTCC, he met Beth Mannella, program director for the Opportunity Greensboro Fellows Program.

The Opportunity Greensboro Fellows Program offers high-quality, paid internship opportunities to local college students. The students spend a summer gaining industry experience, exploring the city of Greensboro and participating in professional development opportunities.

The meeting was all it took to get Dasnoit interested in the program. He started working on his application that very day.

"I was motivated from day one because of what the program had to offer. It got you involved in the community," he said.

He spent the summer interning with Global Brands Group, one of the world's leading branded apparel, footwear and

fashion accessories companies. The organization's finance, order process management, and IT functions are based in Greensboro.

"I learned so much because I got immersed in their IT department. I did desktop support by going out on different floors and troubleshooting employees' computer issues," he said. "I really enjoyed it."

Dasnoit feels his experience in the Opportunity Greensboro Fellows program further enhanced his GTCC education. By taking initiative and applying the networking skills he gained during the program's professional development sessions, Nick secured his first job in IT in Greensboro.

"Nick was very vocal about staying in Greensboro and wanting to start his career here," said Beth Mannella, program director of the Opportunity Greensboro Fellows Program. "I started thinking about who I knew that I could connect him with for an informational interview."

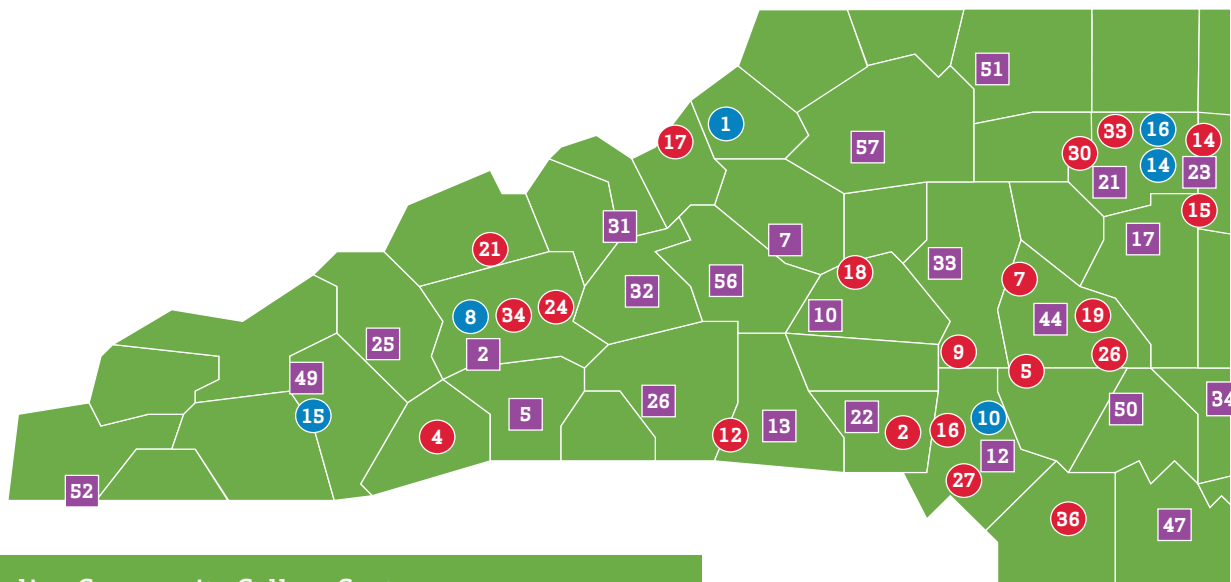
Mannella encouraged Nick to contact Trey Miller, CEO of Triad Tech Services.

"Nick did an informational interview and really took the initiative to stay connected with Trey," added Mannella. "When there was a job opportunity at Triad Tech Services, he was among those selected for an interview."

It was a professional networking success with Dasnoit accepting a full-time position as a technician with Triad Tech Services in late 2017.

"We are a small company, and we are helping these other companies do good things. I enjoy going out and doing fieldwork with the clients," said Dasnoit. "The Opportunity Greensboro Fellows Program was the icing on the cake. It set me up for success."

Locating Education Options



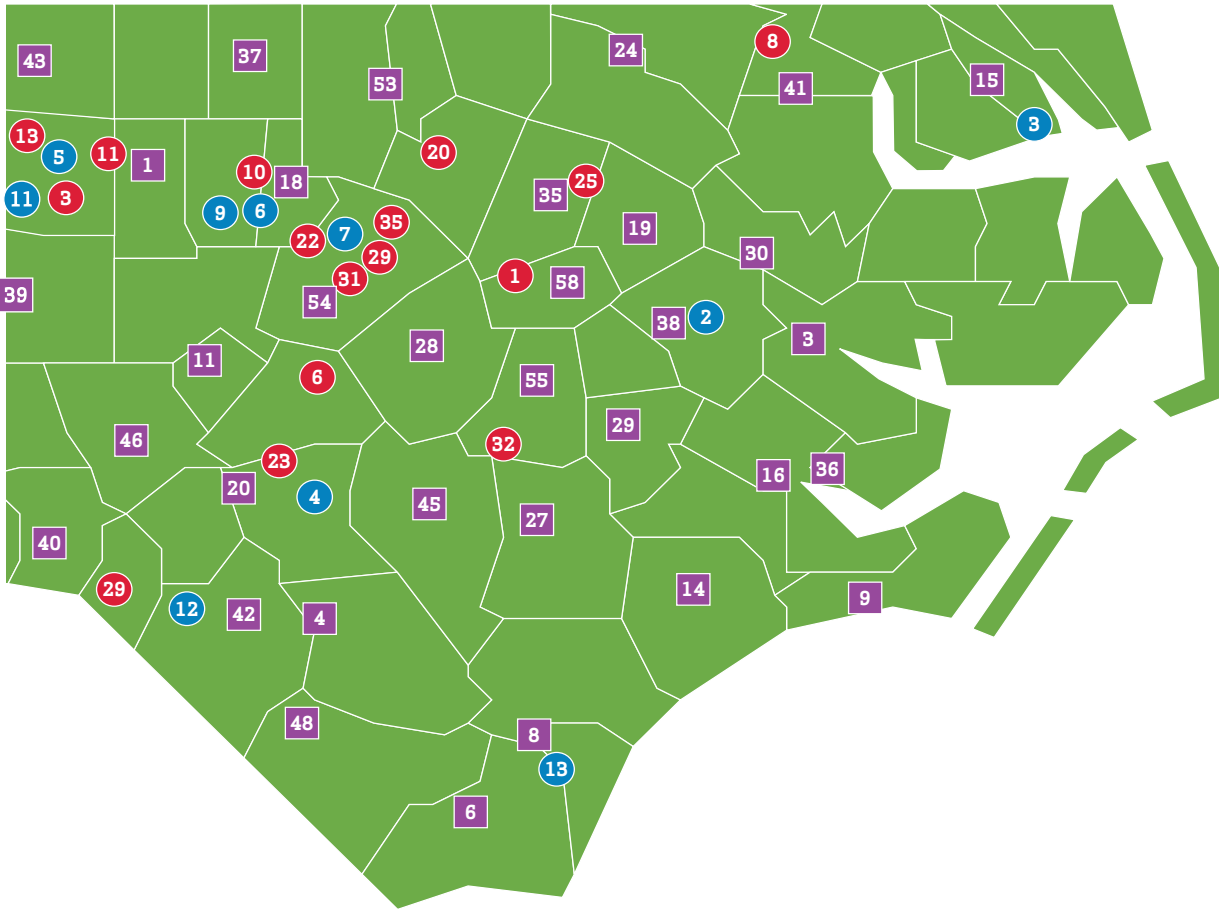
North Carolina Community College System

| | |
|---|--|
| 1. Alamance Community College | 30. Martin Community College |
| 2. Asheville-Buncombe Technical Community College | 31. Mayland Community College |
| 3. Beaufort County Community College | 32. McDowell Technical Community College |
| 4. Bladen Community College | 33. Mitchell Community College |
| 5. Blue Ridge Community College | 34. Montgomery Community College |
| 6. Brunswick Community College | 35. Nash Community College |
| 7. Caldwell Community College and Technical Institute | 36. Pamlico Community College |
| 8. Cape Fear Community College | 37. Piedmont Community College |
| 9. Carteret Community College | 38. Pitt Community College |
| 10. Catawba Valley Community College | 39. Randolph Community College |
| 11. Central Carolina Community College | 40. Richmond Community College |
| 12. Central Piedmont Community College | 41. Roanoke-Chowan Community College |
| 13. Cleveland Community College | 42. Robeson Community College |
| 14. Coastal Carolina Community College | 43. Rockingham Community College |
| 15. College of The Albemarle | 44. Rowan-Cabarrus Community College |
| 16. Craven Community College | 45. Sampson Community College |
| 17. Davidson County Community College | 46. Sandhills Community College |
| 18. Durham Technical Community College | 47. South Piedmont Community College |
| 19. Edgecombe Community College | 48. Southeastern Community College |
| 20. Fayetteville Technical Community College | 49. Southwestern Community College |
| 21. Forsyth Technical Community College | 50. Stanly Community College |
| 22. Gaston College | 51. Surry Community College |
| 23. Guilford Technical Community College | 52. Tri-County Community College |
| 24. Halifax Community College | 53. Vance-Granville Community College |
| 25. Haywood Community College | 54. Wake Technical Community College |
| 26. Isothermal Community College | 55. Wayne Community College |
| 27. James Sprunt Community College | 56. Western Piedmont Community College |
| 28. Johnston Community College | 57. Wilkes Community College |
| 29. Lenoir Community College | 58. Wilson Community College |

Public Universities

1. Appalachian State University
2. East Carolina University
3. Elizabeth City State University
4. Fayetteville State University
5. North Carolina A&T State University
6. North Carolina Central University
7. North Carolina State University
8. UNC Asheville
9. UNC Chapel Hill
10. UNC Charlotte
11. UNC Greensboro
12. UNC Pembroke
13. UNC Wilmington
14. UNC School of the Arts
15. Western Carolina University
16. Winston-Salem State University

Prepare for work through training. Explore your education options by visiting NC's colleges.



Independent Colleges and Universities

| | | |
|--|---------------------------------|------------------------------------|
| 1. Barton College | 13. Greensboro College | 25. N.C. Wesleyan College |
| 2. Belmont Abbey College | 14. Guilford College | 26. Pfeiffer University |
| 3. Bennett College | 15. High Point University | 27. Queens University of Charlotte |
| 4. Brevard College | 16. Johnson C. Smith University | 28. St. Andrews University |
| 5. Cabarrus College of Health Sciences | 17. Lees-McRae College | 29. Saint Augustine's University |
| 6. Campbell University | 18. Lenoir-Rhyne University | 30. Salem College |
| 7. Catawba College | 19. Livingstone College | 31. Shaw University |
| 8. Chowan University | 20. Louisburg College | 32. University of Mount Olive |
| 9. Davidson College | 21. Mars Hill University | 33. Wake Forest University |
| 10. Duke University | 22. Meredith College | 34. Warren Wilson College |
| 11. Elon University | 23. Methodist University | 35. William Peace University |
| 12. Gardner-Webb University | 24. Montreat College | 36. Wingate University |

Exploring the Job Market

Specific job requirements change from industry to industry, business to business, and hiring manager to hiring manager. Whether you're still planning your future career or getting ready to enter the job market, getting a well-rounded understanding of what employers are looking for in job candidates is always helpful. The more research you do in understanding job and employer requirements and preparing yourself to meet those needs, the better positioned you will be to land your dream job. Some steps you can take include:

Read job postings. Get online and search to find what kinds of jobs are out there. Places to start include: NCWorks.gov (see following page), Indeed.com, and linkedin.com/jobs.

Research the occupation. Make sure you understand the occupation and its potential. The Bureau of Labor Statistics' Occupational Outlook Handbook (bls.gov/ooh) and CareerOneStop (careeronestop.org/ExploreCareers/explore-careers.aspx) have thorough descriptions of hundreds of occupations with data on wages and job growth.

Research the industry that interests you. Whether you're preparing for an interview or just trying to better understand a career, learn what you can about the business's industry or occupations. By doing this, you will gain understanding of the opportunities and challenges in this field. Is it growing and successful? Are global or technological changes likely to affect future jobs in this industry? Search engines can help you find information. Look specifically for industry associations — either national or state chapters. In this Career Clusters Guide, the first page of each Career Cluster contains references to industry associations.

Find local employers. Reviewing job postings will likely help you start to identify employers. However, remember that not all companies will be hiring at the moment and not all will post jobs online. Another way to find employers in your area is to use CareerOneStop's Employer Locator tool at careeronestop.org/toolkit/jobs/find-businesses.aspx. Or you can conduct a simple Google search for businesses in your town or city. Limiting your search to industries (advertising agencies, machine shops, medical clinics) may be more helpful than just looking for occupations (social media specialists, welders, nurses).

Research the company. Before ever contacting a potential employer, do your homework and learn what the company does. The more you know about their business, the more impressive employers will find you when you talk with them. Start by reading the company's website and social media pages. If the business is especially large, it may post an annual report on its corporate website. Conduct a Google News search to gather other information about it.

Ask for an informational interview. Talking directly with someone in the company is the best way to learn about what a business does and what the employer looks for in job candidates. Check with friends and other people that you or your family know to see if someone could introduce you to a company employee. If no one within your network is familiar with the business, call it directly. Explain that you would like to know more about the company and its jobs. If you're patient and polite, employers will often find 20-30 minutes to meet and talk with a student or someone who wants to get into their line of work. Make sure you come prepared with questions, don't ask for a job, and be respectful and appreciative of the person's time. For tips on networking and conducting an informational interview, go to careeronestop.org/JobSearch/Network/form-a-network.aspx.

Selected Careers Data Sources & Notes

Sources:

- **O*NET OnLine** (onetonline.org): Information about occupations, career pathways, job descriptions, and interests
- **2014-24 Occupational Projections** (nccommerce.com/lead/data-tools/occupations/projections/statewide): Data for annual openings and growth, prepared by the Labor & Economic Analysis Division, North Carolina Department of Commerce

Notes:

1. Table lists a sampling of representative occupations for each cluster. For a full list, go to O*NET OnLine at onetonline.org/find/career
2. 10-Year Openings includes the total number of jobs available due to growth and separations over 10 years.
3. Growth Rate is the year-over-year growth rate over multiple years. It is not obtained by averaging the year-to-year percentage changes.
4. The Occupational Employment Statistics (OES) program of the Bureau of Labor Statistics produces estimates of wages paid to employees in specific occupations. The entry wage represents the average of the first-third of the wage distribution. A median wage estimate is the midpoint between the highest paid half and the lowest paid half of workers in that occupation (2017 release).
5. Minimum Education Requirements for occupations are determined by the Bureau of Labor Statistics (bls.gov/emp/ep_education_training_system.htm). Actual market conditions may require additional education and/or training.

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