



Careers That Require Mathematics

<u>Careers That Require Advanced Levels of Theoretical Math</u>
<u>Careers For Which Applied Math Are Important</u>
<u>Careers That Require Practical Shop Math</u>
<u>Careers That Require Arithmetic</u>
<u>Career Exploration For Girls</u>

Careers That Require Advanced Levels of Theoretical Math
<ul style="list-style-type: none"> ◆ <u>Actuaries</u> ◆ <u>Agricultural and food scientists</u> ◆ <u>Architects</u> ◆ <u>Biological scientists</u> ◆ <u>Chemists</u> ◆ <u>Computer systems analysts</u> ◆ <u>Economists</u> ◆ <u>Engineers</u> ◆ <u>Foresters and conservation scientists</u> ◆ <u>Geologists, geophysicists, and oceanographers</u> ◆ <u>Mathematicians</u> ◆ <u>Mathematics professor</u> ◆ <u>Meteorologists</u> ◆ <u>Operations research analysts</u> ◆ <u>Physicists and astronomers</u> ◆ <u>Statisticians</u>

Careers For Which Applied Math Are Important

- ◆ Accountants and auditors
- ◆ Aircraft pilots and flight engineers
- ◆ Computer programmers
- ◆ Cost estimators
- ◆ Dentists
- ◆ Drafters
- ◆ Electrical and electronic technicians
- ◆ Engineering technicians
- ◆ Financial managers
- ◆ Insurance sales workers
- ◆ Landscape architects
- ◆ Management analysts and consultants
- ◆ Optometrists
- ◆ Pharmacists
- ◆ Physicians
- ◆ Psychologists
- ◆ Real estate agents and brokers
- ◆ Science technicians
- ◆ Securities and financial services sales workers
- ◆ Sociologists
- ◆ Surveyors
- ◆ Tool programmers, numerical control
- ◆ Underwriters
- ◆ Urban and regional planners
- ◆ Veterinarians

Careers That Require Practical Shop Math

- ◆ Automotive body repairers
- ◆ Automobile mechanics
- ◆ Bricklayers and stonemasons
- ◆ Broadcast technicians
- ◆ Carpenters
- ◆ Construction and building inspectors
- ◆ Electrical and Electronics Installers and Repairers
- ◆ Electricians
- ◆ Industrial machinery mechanics
- ◆ Inspectors, testers, and graders
- ◆ Jewelers
- ◆ Machinists
- ◆ Millwrights
- ◆ Numerical control machine tool operators
- ◆ Ophthalmic laboratory technicians
- ◆ Plumbers, pipefitters, and steamfitters
- ◆ Sheet-metal workers
- ◆ Structural and reinforcing metal workers
- ◆ Surveying and mapping technicians
- ◆ Truck, bus, and diesel engine specialists
- ◆ Tool-and-die makers
- ◆ Welders and cutters

Careers That Require Arithmetic
◆ <u>Bank tellers</u>
◆ <u>Billing, cost and rate clerks</u>
◆ <u>Bookkeepers, accounting, and auditing clerks</u>
◆ <u>Brokerage clerks</u>
◆ <u>Cashiers</u>
◆ <u>Counter and rental clerks</u>
◆ <u>Fast-food counter workers</u>
◆ <u>Insurance claims and policy processing clerks</u>
◆ <u>Loan and credit clerks</u>
◆ <u>Postal clerks</u>
◆ <u>New accounts clerks, banking</u>
◆ <u>Order clerks</u>
◆ <u>Payroll and timekeeping clerks</u>
◆ <u>Reservation and transportation ticket agents and travel clerks</u>
◆ <u>Sales counter clerks</u>
◆ <u>Statement clerks</u>
◆ <u>Stock and inventory clerks</u>
◆ <u>Traffic, shipping, and receiving clerks</u>
◆ <u>Waiters and waitresses</u>
◆ <u>Weighers, measurers, and checkers</u>

Why Choose a Mathematics-Related Profession ?

Mathematics teaches patience, discipline, and step-by-step problem-solving skills. For those with a substantial background in mathematics, an unlimited number of career opportunities are available. According to *Jobs Rated Almanac*, a 1990 publication of World Almanac Books of New York, NY, careers that require a very strong background in mathematics were listed as the five "best" jobs. They were :

- software engineer
- actuary
- computer systems analyst
- computer programmer
- mathematician

Almost all of the top fifty jobs in this "best" jobs list involved mathematical reasoning and knowledge. This list was the result of the comparison of two hundred fifty jobs classified according to :

- income
- future outlook
- physical demands
- job security
- stress
- work environment

A List of Professions

The following list briefly describes work associated with some mathematics-related professions :

- **actuary**-- assemble and analyze statistics to calculate probabilities of death, sickness, injury, disability, unemployment, retirement, and property loss; design insurance and pension plans and ensure that they are maintained on a sound financial basis
- **mathematics teacher**-- introduce students to the power and beauty of mathematics in elementary, junior high, or high school mathematics courses
- **operations research analyst**-- assist organizations (manufacturers, airlines, military) in developing the most efficient, cost-effective solutions to organizational operations and problems; this includes strategy, forecasting, resource allocation, facilities layout, inventory control, personnel schedules, and distribution systems
- **statistician**-- collect, analyze, and present numerical data resulting from surveys and experiments
- **physician**-- diagnose patient illnesses, prescribe medication, teach classes, mentor interns, and do clinical research; students with a good mathematics background will find themselves being admitted to the best medical schools and discover that mathematics has prepared them well for the discipline, analysis, and problem-solving required in the field of medicine
- **research scientist**-- model atmospheric conditions to gain insight into the effect of changing emissions from cars, trucks, power plants, and factories; apply these models in the development of alternative fuels
- **computer scientist**-- interface the technology of computers with the underlying mathematical principles of such diverse applications as medical diagnoses, graphics animation, interior design, cryptography, and parallel computers
- **inventory strategist**-- analyze historical sales data, model forecast uncertainty to design contingency plans, and analyze catalog displays to make them more successful; analyze consumer

responses

- **staff systems air traffic control analyst**-- apply probability, statistics, and logistics to air traffic control operations; use simulated aircraft flight to monitor air traffic control computer systems
- **cryptologist**-- design and analyze schemes used to transmit secret information
- **attorney**-- research, comprehend, and apply local, state, and federal laws; a good background in mathematics will help a student get admitted to law school and assist in the understanding of complicated theoretical legal concepts
- **economist**-- interpret and analyze the interrelationships among factors which drive the economics of a particular organization, industry, or country
- **mathematics professor**-- teach mathematics classes, do theoretical research, and advise undergraduate and graduate students at colleges and universities
- **environmental mathematician**-- work as member of interdisciplinary team of scientists and professionals studying problems at specific Superfund sites; communicate effectively across many academic disciplines and be able to summarize work in writing
- **robotics engineer**-- combine mathematics, engineering, and computer science in the study and design of robots
- **geophysical mathematician** -- develop the mathematical basis for seismic imaging tools used in the exploration and production of oil and gas reservoirs
- **design** -- use computer graphics and mathematical modeling in the design and construction of physical prototypes; integrate geometric design with cost-effective manufacturing of resulting products
- **ecologist** -- study the interrelationships of organisms and their environments and the underlying mathematical dynamics
- **geodesist** -- study applied science involving the precise measurement of the size and shape of the earth and its gravity field (courtesy of Bruce Hedquist)
- **photogrammetrist** -- study the applied science of multi-spectral image acquisition from terrestrial, aerial and satellite camera platforms, followed up by the image processing, analysis, storage, display, and distribution in various hard-copy and digital format (courtesy of Bruce Hedquist)
- **civil engineer** -- plan, design, and manage the construction of land vehicle, aircraft, water, and energy transport systems; analyze and control systems for land vehicular traffic; analyze and control environmental systems for sewage and water treatment; develop sites for industrial, commercial and residential home use; analyze and control systems for storm water drainage and storage; manage construction of foundations, structures and buildings; analyze construction materials ; and surface soils and subterranean material analysis (courtesy of Bruce Hedquist)
- **geomatics engineer** -- once known as "surveying engineer", includes geodetic surveying : takes into account the size and shape of the earth, in order to determine the precise horizontal and vertical positions of geodetic reference monuments; cadastral surveying : establishes and reestablishes the reference monuments for the U.S. Public Land Survey System, i.e., township and section corners; topographic surveying : determines the detailed configuration or contour of the natural earth's surface and the position of fixed objects thereon or related thereto; hydrographic surveying : similarly determines underwater contours and features; land surveying : is the location of existing parcel and new land subdivision lines, road and utility rights-of-way and easement lines, and determination of the location of existing and new reference monuments, which mark property lines and parcel corners; land surveying : also involves the preparation of legal descriptions for officially recorded land ownership conveyance deeds and other land title documents; construction surveying : is the determination of the direction and length between and the elevations of reference points for fixed private and public works, as embraced within the definition and practice of civil engineering, and the labeling of reference markers containing critical information for the construction thereof; design, operation and management of advanced Geographic Information Systems (GIS and Land Information Systems (LIS), as well as other

sophisticated computer mapping and CAD based geospatial applications (courtesy of Bruce Hedquist)

Employers

There are many public and private employers who hire some of the above-mentioned professionals. Besides schools, colleges, universities, and many state and federal agencies, some specific employers include the Internal Revenue Service, U. S. Census Bureau, Ford Motor Co., Transamerica Insurance Co., Jet Propulsion Laboratory, L. L. Bean, IBM Corporation, Center for Communications Research, Sandia National Laboratories, A. C. Nielsen Co., American Airlines, U. S. Department of Energy, Exxon Production Research Co., United Airlines, Bureau of Labor Statistics, Prudential Securities, International Computer Science Institute, National Security Agency, Silicon Graphics, Control Data Corporation, U. S. Geological Survey, Renaissance Software, Goddard Space Flight Center, Los Alamos National Laboratory, and U. S. Department of Agriculture.

A Career in the Mathematical Sciences is Not for You ?

Even if you do not choose a career in the mathematical sciences, studying as much mathematics as you can is a good way to keep your career options open. Mathematics is an excellent foundation for, and is usually a prerequisite to, study in all areas of science and engineering. Students in such areas as anthropology, sociology, and psychology, as well as law, business, and medicine, also benefit from a solid background in mathematics and statistics. It will help you to better understand science and technology and their effects on our world.

Some of the above information is generously provided by The Mathematical Association of America ([MAA](#)) and the Association for Women in Mathematics ([AWM](#)) . Find additional information about teaching of mathematics at the Association of Mathematics Teacher Educators ([AMTE](#))

Please e-mail your comments , questions, or suggestions to Duane Kouba at kouba@math.ucdavis.edu .



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Article Summary: "Math is more than just a way of adding and subtracting. It is a complex discipline that provides the base foundation for a number of professional careers. So, it goes without saying that there are a number of awesome jobs out there that can provide a home for someone with incredible math skills."

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10 Awesome Jobs that Require Great Math Skills

Math is more than just a way of adding and subtracting. It is a complex discipline that provides the basic foundation for a number of professional careers. So, it goes without saying that there are a number of a jobs out there that can provide a home for someone with incredible math skills.

While there are many categories of engineer (electrical, civil, computer, mechanical, etc) all engineering require solid skills in math. Also, there are very few things in this world that can be created without the skilled engineer. Whether you are crossing a bridge or flying around the solar system in a space ship it is the person who makes these things possible. As such, an entire adventurous world is open to someone who picks a career in the engineering field and this can only be achieved by someone with great math skills.

The word photogrammetrist is a tongue twister but if it sounds suspiciously like a photographer that is not surprising. It is a cousin to professional photography. The difference is that this deals with working with images from land based and even satellite based imaging systems. This is truly the cutting edge of photographic work based on signed skills in mathematics.

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Where would we be without computers and, for that matter, where would computers be without the help of computer scientists? One of the lesser known skills of computer science is math aptitude as mathematical principles are the underlying force that creates computer applications. So, math and computer skills go hand in hand.

There is much in the news these days regarding climate change and that has sparked a lot of interest in a field related to it. For those with solid math skills, an environmental mathematician may prove to be on more interesting scientific positions.

Since we already had made mention of engineers why would we give a robotics engineer a separate mention? If you have ever seen a science fiction movie then you know the answer. It's because using your math skills to create robots is mega cool! Surely you have seen the movie I ROBOT? Ok, maybe it is not THAT a career but it certainly is one filled with wonder and perfect for those with a creative mind.

While some may assume that the duties of a statistician are dull such an assumption is not based on any reality as the collection, analyzing and presentation of data derived from experiments can be an interesting profession.

Here is a tongue twister: geophysical mathematician and it is a very important job. Without sources of oil the whole world is in a lot of trouble and this profession uses math skills to help successfully explore for oil and natural gas. Clearly, many people rely on these mathematicians for energy needs.

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Ac

Ok, in the "don't let the title fool you" department the profession of an economist has the potential to be exciting one. Yes, they appear a little dry on all those cable TV business programs but being at the center analyzing of the economy of a company, an industry or even an entire nation can prove to be quite a stimulating job.

Another tongue twister is operations research analyst and it is another critical job because its purpose is discovering how to run a company or industry in a cost effective and better organized manner. Consider mathematical advisor because, in a nutshell, that is what it is.

And saving the most important for last, one of the coolest jobs for those interested in a career in math is math teacher. Not only do you get to share your knowledge with others, but you also get to craft the next generation of mathematical superstars. Not a bad gig, eh?

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North Dakota University System - Table 1 STEM Program Areas and Codes List of Active Programs 2009

(Derived from 2000 Draft CIP's, United States Department of Education)

CIP	Program Areas	CIP	Program Areas	CIP	Program Areas	CIP	Program Areas
01.0201	Agricultural Mechanization, General • Agricultural Systems Management – NDSU	03.0508	Urban Forestry • Urban Forestry Technology – DCB	11.0401	Information Science/Studies • Information Science – UM • Virtual Business – MISU	13.1309	Technology Teacher Education/ Industrial Arts Teacher Education • Technology Education – DSU, UND, VCSU
01.0205	Agricultural Mechanics and Equipment/Machine Technology • John Deere Technology – NDSCS	03.0601	Wildlife and Wildlands Science and Management • Fisheries and Wildlife Sciences – VCSU • Wildlife and Fisheries Technology – DCB	11.0501	Computer Systems Analysis/Analyst • Information Systems – UND	13.1311	Mathematics Teacher Education • Elementary Education/Mathematics – UND • Math Teacher Education – UM • Mathematics Education – DSU, JC, MaSU, MISU, NDSU, VCSU
01.0401	Agricultural and Food Products Processing • Cereal Science – NDSU	04.0201	Architecture • Architecture – NDSU	11.0701	Computer Science • Computer Science – NDSU	13.1316	Science Teacher Education/General Science Teacher Education • Composite Science Education – VCSU • Comprehensive Science Education – NDSU • Earth Science Education – MiSU, NDSU • Physical Science Education – MiSU • Science Education – MiSU, UND • Science Teacher Education – DSU
01.0901	Animal Sciences, General • Animal and Range Sciences – NDSU	04.0401	Environmental Design/Architecture • Environmental Design – NDSU	11.0801	Web Page, Digital/Multimedia and Information Resources Design • Desktop & Web publishing – MiSU • Multimedia Technologies – RC • Web Page Development and Design – BSC	13.1319	Technical Teacher Education • Career and Technical Education – UND, VCSU • Technical Studies – LRSC
01.1001	Food Science • Food Protection – NDSU • Food Science – NDSU	04.0601	Landscape Architecture • Landscape Architecture – NDSU	11.0901	Computer Systems Networking and Telecommunications • Computer Applications – CCCC • Computer Support Specialist – BSC • Information Technology - Network Engineering – DCB	13.1322	Biology Teacher Education • Biological Education – NDSU • Biology Education – DSU, MISU • Biology Teacher Education – JC, UM • Composite Biology Education – MaSU, VCSU
01.1102	Agronomy and Crop Science • Plant Sciences – NDSU	11.0101	Computer and Information Sciences, General • Computer Information Systems – MaSU, NDSCS, UM, VCSU • Computer Science – DSU, JC, MiSU, UND	11.1002	System, Networking, and LAN/WAN Management/Manager • Computer Systems Specialist – WSC	13.1323	Chemistry Teacher Education • Chemistry Education – DSU, JC, MiSU, NDSU • Composite Chemistry Education – MaSU, VCSU
01.1103	Horticultural Science • Horticulture – NDSU	11.0103	Information Technology • Enterprise Application – VCSU • Information Technology – SBC	11.1004	Web/Multimedia Management and Webmaster • Information Technology - Web Master – DCB	13.1329	Physics Teacher Education • Composite Physical Science – MaSU
01.1105	Plant Protection and Integrated Pest Management • Plant Protection – NDSU	11.0199	Computer and Information Sciences, Other • Computer Systems Technology – DCB	11.9999	Computer and Information Sciences and Support Services, Other • Computer Information System (BAS) – MaSU • Information Technology - Web Design – DCB		
01.1201	Soil Science and Agronomy, General • Soil Science – NDSU	11.0201	Computer Programming/Programmer, General • Computer Science Basic Programming – MiSU • Software Systems Design – RC	13.0501	Educational/Instructional Media Design • Instructional Design & Technology – UND		
03.0101	Natural Resources/Conservation, General • Environmental Technology-Natural Resource Management – DCB	11.0301	Data Processing and Data Processing Technology/ Technician • Computer Technology Management – DSU • Information Processing Technician – WSC • Information Technology – MaSU	13.1309	Technology Teacher Education/ Industrial Arts Teacher Education • Education – VCSU		
03.0103	Environmental Studies • Earth System Science and Policy – UND						
03.0104	Environmental Science • Environmental Science – FBCC, SBC						
03.0201	Natural Resources Management and Policy • Natural Resources Management – CCCC, NDSU						

• Indicates programs known to exist in North Dakota. Students graduating from comparable programs in other states are eligible when students meet North Dakota residency and other requirements.

Acronyms: BSC = Bismarck State College, DCB = Dakota College at Bottineau, DSU = Dickinson State University, FBCC = Fort Berthold Community College, JC = Jamestown College, LRSC = Lake Region State College, MaSU = Mayville State University, MiSU = Minot State University, NDSCS = North Dakota State College of Science, NDSU = North Dakota State University, RC = Rasmussen College, TMCC = Turtle Mountain Community College, UM = University of Mary, UTTC = United Tribes Technical College, UND = University of North Dakota, VCSU = Valley City State University, WSC = Williston State College

<u>CIP</u>	<u>Program Areas</u>	<u>CIP</u>	<u>Program Areas</u>	<u>CIP</u>	<u>Program Areas</u>	<u>CIP</u>	<u>Program Areas</u>
13.1329	Physics Teacher Education • Physical Science Education – MaSU • Physics Education – MISU, NDSU	14.3601	Manufacturing Engineering • Manufacturing Engineering – NDSU	15.0503	Energy Management and Systems Technology/Technician • Energy Technician – SBC	26.0101	Biology/Biological Sciences, General • Biology – DSU, JC, MaSU, MISU, NDSU, UM, VCSU • Biology/Pre-Health – UND
14.0101	Engineering, General • Engineering – NDSU • Engineering Science – UM	14.3801	Surveying Engineering • Environmental Technology-Geographic Information Systems – DCB	15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician • Environmental Technology - Water Management – DCB • Water Quality Technology – DCB	26.0202	Biochemistry • Biochemistry – JC, NDSU, UND
14.0301	Agricultural/Biological Engineering and Bioengineering • Agricultural & Biosystems Engineering – NDSU	14.3901	Geological/Geophysical Engineering • Geological Engineering – UND	15.0507	Environmental Engineering Technology/Environmental Technology • Environmental Technology-Laboratory & Field Technician – DCB	26.0210	Biochemistry/Biophysics and Molecular Biology • Biochemistry & Molecular Biology – NDSU
14.0701	Chemical Engineering • Chemical Engineering – UND	14.9999	Engineering, Other • Engineering – UND	15.0612	Industrial Technology/Technician • Industrial Technology – UND • Process Plant Technology – BSC	26.0301	Botany/Plant Biology • Botany – NDSU
14.0801	Civil Engineering, General • Civil Engineering – NDSU, UND	15.0000	Engineering Technology/General • Engineering Technician – BSC	15.0613	Manufacturing Technology/Technician • Automated Manufacturing Technician – NDSCS	26.0305	Plant Pathology/Phytopathology • Plant Pathology – NDSU
14.0899	Civil Engineering, Other • Materials & Nanotechnology – NDSU	15.0101	Architectural Engineering Technology/Technician • Architectural Drafting & Estimating Technology – NDSCS	15.0699	Industrial Production Technologies/Technicians, Other • Power Plant Technology – BSC	26.0403	Anatomy • Anatomy – UND
14.0901	Computer Engineering, General • Computer Engineering – NDSU	15.0201	Civil Engineering Technology/Technician • Civil Engineering & Surveying Technology – NDSCS	15.0701	Occupational Safety and Health Technology/Technician • Occupational Safety & Environmental Health – UND	26.0406	Cell/Cellular and Molecular Biology • Cellular & Molecular Biology – NDSU
14.0903	Computer Software Engineering • Software Engr – NDSU	15.0303	Electrical, Electronic and Communications Engineering Technology/Technician • Electric Power Technology – BSC • Electrical Transmission Systems Technology – BSC • Electronics/Telecommunications Technology – BSC	15.0903	Petroleum Technology/Technician • Petroleum Production Technology – WSC	26.0502	Microbiology, General • Microbiology – NDSU
14.1001	Electrical, Electronics and Communications Engineering • Electrical & Comp Engr – NDSU • Electrical Engineering – NDSU, UND	15.0399	Electrical and Electronic Engineering Technologies/Technicians • Electrical Technology – NDSCS • Electronic Technology – NDSCS	15.1001	Construction Engineering Technology/Technician • Construction Mgmt Tech – NDSCS	26.0503	Medical Microbiology and Bacteriology • Microbiology – UND
14.1401	Environmental/Environmental Health Engineering • Environmental Engineering – NDSU • Environmental Geoscience – UND	15.0499	Electromechanical & Instrumentation and Maintenance Technologies/Technicians, Other • Instrumentation and Control Technologies – BSC	15.1102	Surveying Technology/Surveying • Geographic Information System Technician – BSC	26.0701	Zoology/Animal Biology • Zoology – NDSU
14.1801	Materials Engineering • Materials & Nanotechnology – NDSU	15.0501	Heating, Air Conditioning and Refrigeration Technology/Technician (ACH/ACR/ACHR/HRAC/HVAC/AC Technology) • Heating, Ventilating, Air Conditioning & Refrigeration Technology – NDSCS • Refrigeration & Air Conditioning Technology – NDSCS	15.1401	Nuclear Engineering Technology/Technician • Nuclear Power Technology – BSC	26.0702	Entomology • Entomology – NDSU
14.1901	Mechanical Engineering • Mechanical Engineering – NDSU,UND			15.9999	Engineering Technologies/Technicians, Other • Energy Technology – FBCC • Nanoscience Technology – NDSCS	26.0709	Wildlife Biology • Fisheries & Wildlife Biology – UND
14.3301	Construction Engineering • Construction Engineering – NDSU			26.0101	Biology/Biological Sciences, General • Biological Sciences – NDSU	26.0801	Genetics, General • Genomics and Bioinformatics – NDSU
14.3501	Industrial Engineering • Industrial & Manufacturing Engr – NDSU • Industrial Engineering & Management – NDSU					26.0910	Pathology/Experimental Pathology • Molecular Pathogenesis – NDSU

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Program Code	Program Name	Program Code	Program Name	Program Code	Program Name
26.9999	Biological and Biomedical Sciences, Other • Science – FBCC • Tribal Environmental Science – UTTC	46.0303	Lineworker • Lineworker, Electrical – BSC	48.0508	Welding Technology/Welder • Welding Technology – NDSCS
27.0101	Mathematics, General • Mathematics – DSU, FBCC, JC, MaSU, MiSU, NDSU, UM, UND, VCSU	47.0101	Electrical/Electronics Equipment Installation & Repair, General • Electrical Wiring – UTTC	49.0101	Aeronautics/Aviation/Aerospace Science and Technology, General • Aeronautical Studies – UND • Aviation – UND
27.0301	Applied Mathematics • Applied Math, General – JC	47.0104	Computer Installation and Repair Technology/Technician • Simulator Maintenance Technician – LRSC	49.0102	Airline/Commercial/Professional Pilot and Flight Crew • Commercial Aviation – UND
27.0501	Statistics, General • Applied Statistics – NDSU • Statistics – NDSU	47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician • Heating, Ventilation and Air Conditioning – BSC • Mechanical Systems – NDSCS • Plumbing – FBCC	49.0104	Aviation/Airway Management and Operations • Airport Management – UND • Aviation Management – UND • Aviation Systems Management – UND
30.0101	Biological and Physical Sciences • Math/Science Composite – UM	47.0303	Industrial Mechanics and Maintenance Technology • Mechanical Maintenance Technology – BSC	49.0105	Air Traffic Controller • Air Traffic Control – UND
30.1101	Multi/Interdisciplinary Studies • Gerontology – NDSU	47.0604	Automobile/Automotive Mechanics Technology/Technician • Automotive Service Technology – UTTC • Automotive Technology – BSC, CCCC, LRSC, NDSCS, WSC	49.0108	Flight Instructor • Flight Education – UND
40.0101	Physical Sciences • Physical Science – MiSU, UND	47.0605	Diesel Mechanics Technology/Technician • Caterpillar Dealer Service Technician – NDSCS • Diesel Technology – LRSC, NDSCS, WSC	49.0199	Air Transportation, Other (some qualify) • Space Studies – UND
40.0401	Atmospheric Sciences and Meteorology, General • Atmospheric Sciences – UND • Atmospheric Studies – UND	47.0606	Small Engine Mechanics and Repair Technology/Technician • Recreational Engines Technology – NDSCS	51.0904	Emergency Medical Technology/Technician (EMT Paramedic) • EMT Paramedic Technology – BSC
40.0501	Chemistry, General • Chemistry – DSU, JC, MaSU, MiSU, NDSU, UND, VCSU	47.0699	Vehicle Maintenance and Repair Technologies, Other (some qualify) • Automotive & Diesel Master Technician – NDSCS	51.0907	Medical Radiologic Technology/Science - Radiation Therapist • Radiologic Technology – JC, MiSU
40.0507	Polymer Chemistry • Coatings & Polymeric Materials – NDSU	48.0501	Machine Tool Technology/Machinist • Machinist and Toolmaker – NDSCS	51.0908	Respiratory Care Therapy/Therapist • Respiratory Care – NDSU, UM
40.0601	Geology/Earth Science, General • Geology – MiSU, NDSU, UND	48.0508	Welding Technology/Welder • Welding – BSC • Welding & Basic Machining – LRSC	51.0909	Surgical Technology/Technologist • Surgical Technology – BSC
40.0801	Physics, General • Physics – MiSU, NDSU, UND			51.0910	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician
41.0301	Chemical Technology/Technician • Science Technology – NDSCS			51.0911	Radiologic Technology/Science-Radiographer • Radiologic Sciences – NDSU • Radiologic Technology – UM
41.9999	Science Technologies/Technicians, Other • Bio-fuels Technology – NDSCS • Nanoscience Technology – NDSCS			51.1002	Cytotechnology/Cytotechnologist • Cytotechnology – UND
43.0106	Forensic Science and Technology • Forensic Science – UND				
				51.1004	Clinical/Medical Laboratory Technician • Clinical Laboratory Technician – BSC • Medical Laboratory Technician – RC
				51.1005	Clinical Laboratory Science/Medical Technology/Technologist • Clinical Laboratory Science – JC, MiSU, NDSU, UM, UND • Clinical Laboratory Science Management – UND • CLS Clinical Chemistry/Urinalysis – UND • CLS Hematology/Homeostasis – UND • CLS Immunohematology – UND • CLS Microbiology – UND • Medical Technology – JC
				51.1099	Clinical/Medical Laboratory Science and Allied Professions, Other • Phlebotomy Technician – BSC
				52.0209	Transportation/Transportation Management • Transportation & Logistics – NDSU
				52.1201	Management Information Systems, General • Information Systems – MiSU • Information Technologies – LRSC • Information Technology Management – RC • Management Information Science – JC • Management Information Systems – MiSU, NDSU, UM
				52.1299	Management Information Systems and Services, Other (some qualify) • Applied Business Information Technology – MiSU • Information Systems Management – RC • Knowledge Management – MiSU

• Indicates programs known to exist in North Dakota. Students graduating from comparable programs in other states are eligible when students meet North Dakota residency and other requirements.

Acronyms: BSC = Bismarck State College, DCB = Dakota College at Bottineau, DSU = Dickinson State University, FBCC = Fort Berthold Community College, JC = Jamestown College, LRSC = Lake Region State College, MaSU = Mayville State University, MiSU = Minot State University, NDSCS = North Dakota State College of Science, NDSU = North Dakota State University, RC = Rasmussen College, TMCC = Turtle Mountain Community College, UM = University of Mary, UTTC = United Tribes Technical College, UND = University of North Dakota, VCSU = Valley City State University, WSC = Williston State College

North Dakota University System - Table 2. STEM Job Occupations and Codes

A degree from Table 1 is required for Table 2 occupations to qualify

(Derived from <http://online.onetcenter.org/crosswalk/>)

<u>SOC</u>	<u>Occupation</u>	<u>SOC</u>	<u>Occupation</u>	<u>SOC</u>	<u>Occupation</u>	<u>SOC</u>	<u>Occupation</u>
11-3011	Administrative Services Managers	17-2011	Aerospace Engineers	19-1020	Biologists	25-1021	Computer Science Teachers, Postsecondary
11-3021	Computer and Information Systems Managers	17-2021	Agricultural Engineers	19-1021	Biochemists and Biophysicists	25-1022	Mathematical Science Teachers, Postsecondary
11-3071	Storage and Distribution Managers	17-2031	Biomedical Engineers	19-1022	Microbiologists	25-1031	Architecture Teachers, Postsecondary
11-3071	Transportation Managers	17-2041	Chemical Engineers	19-1023	Zoologists and Wildlife Biologists	25-1032	Engineering Teachers, Postsecondary
11-9011	Crop and Livestock Managers	17-2051	Civil Engineers	19-1029	Biological Scientists, All Other	25-1041	Agricultural Sciences Teachers, Postsecondary
11-9011	Nursery and Greenhouse Managers	17-2061	Computer Hardware Engineers	19-1030	Conservation Scientists and Foresters	25-1042	Biological Science Teachers, Postsecondary
11-9012	Farmers and Ranchers	17-2071	Electrical Engineers	19-1031	Conservation Scientists	25-1043	Forestry and Conservation Science Teachers, Postsecondary
11-9021	Construction Managers	17-2072	Electronics Engineers, Except Computer	19-1031	Range Managers	25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
11-9041	Engineering Managers	17-2081	Environmental Engineers	19-1031	Park Naturalists	25-1052	Chemistry Teachers, Postsecondary
11-9121	Natural Sciences Managers	17-2111	Product Safety Engineers	19-1031	Soil and Water Conservationists	25-1053	Environmental Science Teachers, Postsecondary
11-9199	Managers, All Other	17-2111	Industrial Safety and Health Engineers	19-1032	Foresters	25-1054	Physics Teachers, Postsecondary
13-1051	Cost Estimators	17-2111	Fire-Prevention and Protection Engineers	19-1041	Epidemiologists	25-1071	Health Specialties Teachers, Postsecondary
13-1081	Logisticians	17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	19-1042	Medical Scientists, Except Epidemiologists	25-1081	Education Teachers, Postsecondary
15-0000	Computer and Mathematical Science Occupations	17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	19-1099	Life Scientists, All Other	25-1194	Vocational Education Teachers, Postsecondary
15-1011	Computer and Information Scientists, Research	17-2112	Industrial Engineers	19-2011	Astronomers	25-2022	Middle School Teachers, Except Special and Vocational Education
15-1021	Computer Programmers	17-2121	Marine Engineers and Naval Architects	19-2012	Physicists	25-2023	Vocational Education Teachers, Middle School
15-1021	Computer Science Teachers, Postsecondary	17-2131	Materials Engineers	19-2021	Atmospheric and Space Scientists	25-2031	Secondary School Teachers, Except Special and Vocational Education
15-1031	Computer Software Engineers, Applications	17-2141	Mechanical Engineers	19-2031	Chemists	25-2032	Vocational Education Teachers, Secondary School
15-1032	Computer Software Engineers, Systems Software	17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	19-2032	Material Scientists	25-9011	Audio-Visual Collections Specialists
15-1041	Computer Support Specialists	17-2161	Nuclear Engineers	19-2041	Environmental Scientists and Specialists, Including Health	25-9031	Instructional Coordinators
15-1051	Computer Systems Analysts	17-2171	Petroleum Engineers	19-2042	Geoscientists, Except Hydrologists and Geographers	25-9099	Education, Training, and Library Workers, All Other
15-1061	Database Administrators	17-2199	Engineers, All Other	19-2043	Hydrologists	27-1014	Multi-Media Artists and Animators
15-1071	Computer Security Specialists	17-3021	Aerospace Engineering and Operations Technicians	19-2099	Physical Scientists, All Other	27-1024	Graphic Designers
15-1071	Network and Computer Systems Administrators	17-3022	Civil Engineering Technicians	19-3099	Social Scientists and Related Workers, All Other	29-1124	Radiation Therapists
15-1081	Network Systems and Data Communications Analysts	17-3023	Electrical Engineering Technicians	19-4011	Food Science Technicians	29-1126	Respiratory Therapists
15-1099	Computer Specialists, All Other	17-3023	Electrical and Electronic Engineering Technicians	19-4011	Agricultural Technicians	29-2011	Medical and Clinical Laboratory Technologists
15-2011	Actuaries	17-3023	Electronics Engineering Technicians	19-4011	Agricultural and Food Science Technicians	29-2012	Medical and Clinical Laboratory Technicians
15-2021	Mathematicians	17-3023	Electronics Engineering Technicians	19-4031	Chemical Technicians	29-2031	Cardiovascular Technologists and Technicians
15-2031	Operations Research Analysts	17-3024	Electro-Mechanical Technicians	19-4041	Geological and Petroleum Technicians	29-2032	Diagnostic Medical Sonographers
15-2041	Statisticians	17-3025	Environmental Engineering Technicians	19-4041	Nuclear Technicians	29-2033	Nuclear Medicine Technologists
15-2091	Mathematical Technicians	17-3026	Industrial Engineering Technicians	19-4051	Nuclear Monitoring Technicians	29-2034	Radiologic Technologists
15-2099	Mathematical Science Occupations, All Other	17-3027	Mechanical Engineering Technicians	19-4051	Nuclear Equipment Operation Technicians		
17-1011	Architects, Except Landscape and Naval	17-3029	Engineering Technicians, Except Drafters, All Other	19-4091	Environmental Science and Protection Technicians, Including Health		
17-1012	Landscape Architects	17-3031	Surveying Technicians	19-4092	Forensic Science Technicians		
17-1021	Cartographers and Photogrammetrists	17-3031	Mapping Technicians	19-4093	Forest and Conservation Technicians		
17-1022	Surveyors	19-1011	Animal Scientists	19-4099	Life, Physical, and Social Science Technicians, All Other		
		19-1012	Food Scientists and Technologists				
		19-1013	Soil and Plant Scientists				

Code	Description	Code	Description	Code	Description	Code	Description
29-2034	Radiologic Technologists and Technicians	49-9011	Mechanical Door Repairers	51-4041	Machinists	53-2021	Air Traffic Controllers
29-2034	Radiologic Technicians	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	51-4111	Tool and Die Makers	53-2022	Airfield Operations Specialists
29-2041	Emergency Medical Technicians and Paramedics	49-9041	Industrial Machinery Mechanics	51-4121	Solderers and Brazers	53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians
29-2053	Psychiatric Technicians	49-9043	Maintenance Workers, Machinery	51-4121	Welders, Cutters, and Welder Fitters		
29-2054	Respiratory Therapy Technicians	49-9044	Millwrights	51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders		
29-2055	Surgical Technologists	49-9045	Refractory Materials Repairers, Except Brickmasons	51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic		
29-9011	Occupational Health and Safety Specialists	49-9051	Electrical Power-Line Installers and Repairers	51-4192	Lay-Out Workers, Metal and Plastic		
29-8012	Occupational Health and Safety Technicians	49-9062	Medical Equipment Repairers	51-4199	Metal Workers and Plastic Workers, All Other		
33-3031	Fish and Game Wardens	49-9069	Precision Instrument and Equipment Repairers, All Other	51-6062	Textile Cutting Machine Setters, Operators, and Tenders		
43-9011	Computer Operators	49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	51-6063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders		
43-9031	Desktop Publishers	49-9098	Helpers—Installation, Maintenance, and Repair Workers	51-6064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders		
45-1011	First-Line Supervisors/Managers of Agricultural Crop and Horticultural Workers	51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	51-7041	Sawing Machine Setters, Operators, and Tenders, Wood		
45-1011	First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers	51-2022	Electrical and Electronic Equipment Assemblers	51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing		
45-2011	Agricultural Inspectors	51-2023	Electromechanical Equipment Assemblers	51-8011	Nuclear Power Reactor Operators		
45-2021	Animal Breeders	51-2031	Engine and Other Machine Assemblers	51-8012	Power Distributors and Dispatchers		
45-4011	Forest and Conservation Workers	51-3091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	51-8013	Power Plant Operators		
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	51-3092	Food Batchmakers	51-8031	Water and Liquid Waste Treatment Plant and System Operators		
47-4011	Construction and Building Inspectors	51-3093	Food Cooking Machine Operators and Tenders	51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers		
47-4021	Elevator Installers and Repairers	51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	51-9011	Chemical Equipment Operators and Tenders		
49-2011	Computer, Automated Teller, and Office Machine Repairers	51-4012	Numerical Tool and Process Control Programmers	51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders		
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	51-9021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders		
49-2091	Avionics Technicians	51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	51-9023	Mixing and Blending Machine Setters, Operators, and Tenders		
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	51-9032	Cutting and Slicing Machine Setters, Operators, and Tenders		
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders		
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-9121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders		
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-9141	Semiconductor Processors		
49-3011	Aircraft Mechanics and Service Technicians	51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-9196	Paper Goods Machine Setters, Operators, and Tenders		
49-3023	Automotive Master Mechanics	51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	53-1011	Aircraft Cargo Handling Supervisors		
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists			53-2011	Airline Pilots, Copilots, and Flight Engineers		
49-3041	Farm Equipment Mechanics			53-2012	Commercial Pilots		
49-3051	Motorboat Mechanics						
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics						
49-3092	Recreational Vehicle Service Technicians						