



Manufacturing Career Cluster

| Pathway | OCCUPATIONS RELATING TO THIS CAREER CLUSTER |
|---|---|
| Health, Safety & Environmental Assurance | Environmental Engineer • Health and Safety Specialist • Safety Team Leader • Environmental Specialist • Safety Coordinator • Environmental Field Technician |
| Logistics & Inventory Control | Dispatcher • Freight/Stock/Material Mover • Industrial Truck & Tractor Operator • Materials Handler • Logistical Engineer • Quality Control Technician |
| Maintenance, Installation & Repair | Computer Repair Technician • Boilermaker • Communication Systems Installer • Laser Systems Technician • Industrial Machinery Mechanic • Instrument Calibration Technician |
| Manufacturing Production Process Development | Industrial Engineer • Manufacturing Technician • Purchasing Agent • Precision Inspector, Tester and Grader • Production Manager • Electronics Engineer |
| Production | Welder • Calibration Technician • Precision Layout Worker • Assembler • Tool & Die Maker • Sheet Metal Worker • Micro and Nano Fabrication Technicians |
| Quality Assurance | Process Control Technician • Inspector • Quality Control Technician • Calibration Technician • Lab Technician • Statistical Process Control (SPC) Coordinator |

| HIGH SCHOOL COURSE REQUIREMENTS | | | | | | | | | |
|---|--|--|--|---|--|--|--|--|--|
| English | Math | Science | Social Studies | Physical Education | | | | | |
| Four units required to graduate; including literature, composition, and speech. | Three units required to graduate | Three units required to graduate. | Three units required to graduate. | One unit required to graduate. | | | | | |
| Choices may include: | Choices may include: | Required Units: | Required Units: | Required Units: | | | | | |
| <input type="checkbox"/> English 9 05071 | <input type="checkbox"/> Algebra I 11031 | <input type="checkbox"/> Physical Science 13030 | <input type="checkbox"/> U.S. History 15085 | <input type="checkbox"/> Physical Education 1 unit 08030 | | | | | |
| <input type="checkbox"/> English 10 05072 | <input type="checkbox"/> Geometry 11120 | <input type="checkbox"/> Biology 13020 | <input type="checkbox"/> American Government ½ unit AND 15111 | OR | | | | | |
| <input type="checkbox"/> English 11 05073 | <input type="checkbox"/> Advanced Algebra 11032 | | <input type="checkbox"/> Economics ½ unit 15060 | <input type="checkbox"/> Physical Education ½ unit AND 08030 | | | | | |
| <input type="checkbox"/> English 12 05074 | | Additional units may include: | OR | <input type="checkbox"/> Health ½ unit 18010 | | | | | |
| | | <input type="checkbox"/> Botany | <input type="checkbox"/> Problems of Democracy 1 unit 15201 | | | | | | |
| | | <input type="checkbox"/> Chemistry | | | | | | | |
| | | <input type="checkbox"/> Environmental Science | Additional units may include: | | | | | | |
| | | <input type="checkbox"/> Physics | <input type="checkbox"/> Civics | | | | | | |
| | | | <input type="checkbox"/> Geography | | | | | | |
| | | | <input type="checkbox"/> Psychology | | | | | | |
| | | | <input type="checkbox"/> World History | | | | | | |

| Career & Technical Education Electives | Extended Learning Opportunities |
|--|--|
| Three units of foreign or Native American language, fine arts, or career and technical education are required to graduate. | |
| Agriculture Education | School-Based: |
| <input type="checkbox"/> Ag Mechanics Technology I 01043 | <input type="checkbox"/> SkillsUSA |
| <input type="checkbox"/> Ag Mechanics Technology II 01044 | <input type="checkbox"/> TSA |
| <input type="checkbox"/> Ag Mechanics Technology III 01045 | <input type="checkbox"/> FFA |
| <input type="checkbox"/> Ag Welding and Fabrication 01046 | <input type="checkbox"/> FCCLA |
| <input type="checkbox"/> Advanced Ag Welding & Fabrication 01047 | <input type="checkbox"/> DECA |
| | <input type="checkbox"/> FBLA |
| Business Education | Community Based: |
| <input type="checkbox"/> Business Technology & Procedures 14079 | <input type="checkbox"/> Mentorship |
| <input type="checkbox"/> Database 14026 | <input type="checkbox"/> Volunteer |
| <input type="checkbox"/> Spreadsheets 14025 | <input type="checkbox"/> Part-time Employment |
| <input type="checkbox"/> Business Fundamentals 14230 | <input type="checkbox"/> Service Learning Project |
| | <input type="checkbox"/> Job Shadow |
| | <input type="checkbox"/> Internship |
| Technology & Engineering Education | <input type="checkbox"/> Career Research |
| <input type="checkbox"/> Automated Manufacturing 17113 | <input type="checkbox"/> Cooperative Work Experience |
| <input type="checkbox"/> Engineering Design 10415 | |
| <input type="checkbox"/> Drafting Technology I 17130 | |
| <input type="checkbox"/> PLTW Introduction to Engineering Design 10511 | |
| <input type="checkbox"/> Drafting Technology II 17131 | |
| <input type="checkbox"/> PLTW Principles of Engineering 10513 | |
| <input type="checkbox"/> Machine Tooling Technology 17230 | |
| <input type="checkbox"/> PLTW Computer Integrated Manufacturing 10517 | |
| <input type="checkbox"/> Sheet Metal Technology 17115 | |
| <input type="checkbox"/> Manufacturing Technology 10121 | |
| <input type="checkbox"/> Welding Technology I 17236 | |
| <input type="checkbox"/> Production Technology 10110 | |
| <input type="checkbox"/> Welding Technology II 17237 | |
| <input type="checkbox"/> Robotics Engineering 10411 | |
| <input type="checkbox"/> Electronics Technology I 17150 | |
| <input type="checkbox"/> Electronics Technology II 17151 | |
| <input type="checkbox"/> Electronics Technology III 17152 | |

North Dakota Manufacturing Related Postsecondary Programs

| Pathway | Associate's Degree or Less | Bachelor's Degree | Master's Degree or More |
|---|--|---|---|
| Health, Safety & Environmental Assurance | <input type="checkbox"/> Emergency Management transfer (NDSCS) <input type="checkbox"/> Environmental Public Health (TMCC) <input type="checkbox"/> Environmental Technology/Science transfer (CCCC, NHSC, SBC, TMCC, UTTC, WSC) | <input type="checkbox"/> Emergency Management (NDSU) <input type="checkbox"/> Environmental Design (NDSU) <input type="checkbox"/> Environmental Science (DSU, NHSC, SBC) <input type="checkbox"/> Health Communication (NDSU) | <input type="checkbox"/> Emergency Management (NDSU) <input type="checkbox"/> Environmental and Conservation Sciences (NDSU, SBC) <input type="checkbox"/> Environmental Engineering (NDSU, UND) |
| Logistics & Inventory Control | <input type="checkbox"/> Information Management/Technology (DCB) <input type="checkbox"/> Information Processing Specialist (BSC) <input type="checkbox"/> Management Information Systems (NDSCS) | <input type="checkbox"/> Business Process Management (VCSU) <input type="checkbox"/> Computer Technology Management (DSU) <input type="checkbox"/> Energy Economics and Finance (MISU) <input type="checkbox"/> Management Information Systems (MISU, NDSU) <input type="checkbox"/> Operations and Supply Chain Management (UND) | <input type="checkbox"/> Transportation and Logistics (NDSU) |
| Maintenance, Installation & Repair | <input type="checkbox"/> Electrical Lineworker (BSC) <input type="checkbox"/> Electrical Power Technology (BSC) <input type="checkbox"/> Electrical Transmission Systems Technology (BSC) <input type="checkbox"/> Electronics Technology (BSC) <input type="checkbox"/> Electronics and Telecommunications Technology (BSC) <input type="checkbox"/> Mechanical Maintenance Technology (BSC) <input type="checkbox"/> Welding Technology (BSC, BJCC, LW, NDSCS, NHSC, SBC, TMCC, UTTC, WSC) <input type="checkbox"/> Wind Energy Technician (LRSC) | <input type="checkbox"/> Industrial Technology (UND) | |
| Manufacturing Process Production Development | <input type="checkbox"/> Engineering Technology (BSC) <input type="checkbox"/> Power Plant Technology (BSC) <input type="checkbox"/> Process Plant Technology (BSC, TMCC) <input type="checkbox"/> Renewable Generation Technology (BSC) | <input type="checkbox"/> Engineering Science (UM) <input type="checkbox"/> Industrial Engineering and Management (NDSU) <input type="checkbox"/> Manufacturing Engineering (NDSU) | <input type="checkbox"/> Engineering (NDSU) <input type="checkbox"/> Industrial Engineering and Management (NDSU) <input type="checkbox"/> Industrial and Manufacturing Engineering (NDSU) <input type="checkbox"/> Manufacturing Engineering (NDSU) |
| Production | <input type="checkbox"/> Heating, Ventilation, and Air Conditioning (BSC, CCCC, NDSCS, TMCC) <input type="checkbox"/> Precision Machining Technology (NDSCS) <input type="checkbox"/> Production Operations/Refinery Training (NHSC) <input type="checkbox"/> Robotics, Automation and Mechatronics Technology (NDSCS) <input type="checkbox"/> Welding Technology (BSC, BJCC, LW, NDSCS, NHSC, SBC, TMCC, UTTC, WSC) | <input type="checkbox"/> Energy Management (BSC) | <input type="checkbox"/> Materials and Nanotechnology (NDSU) |
| Quality Assurance | <input type="checkbox"/> Instrumentation and Control Technology (BSC) | <input type="checkbox"/> Industrial Engineering and Management (NDSU) | <input type="checkbox"/> Industrial Engineering and Management (NDSU) |

North Dakota Postsecondary Institutions Offering Manufacturing Related Programs

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|--------------|------------------------------------|---|-------------|-----------------------------------|--|
| BSC | Bismarck State College | www.bismarckstate.edu | NDSU | ND State University | www.ndsu.edu |
| BJCC | Burdick Job Corps Center | http://quentinnburdick.jobcorps.gov | NHSC | Nueta Hidatsa Sahnish College | http://nhsc.edu |
| CCCC | Cankdeska Cikana Community College | www.littlehoop.edu | SBC | Sitting Bull College | www.sittingbull.edu |
| DCB | Dakota College at Bottineau | www.dakotacollege.edu | TMCC | Turtle Mountain Community College | www.tm.edu |
| DSU | Dickinson State University | www.dickinsonstate.edu | UTTC | United Tribes Technical College | www.uttc.edu |
| LRSC | Lake Region State College | www.lrsc.edu | UM | University of Mary | www.umary.edu |
| LW | Lynnes Welding – Bismarck & Fargo | http://learntoweld.com | UND | University of North Dakota | www.und.edu |
| MISU | Minot State University | www.minotstateu.edu | VCSU | Valley City State University | www.vcsu.edu |
| NDSCS | ND State College of Science | www.ndscs.edu | WSC | Williston State College | www.willistonstate.edu |