



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"/> One additional unit of Science	<input type="checkbox"/> Economics ½ unit 15060	<input type="checkbox"/> Physical Education ½ unit AND 08030					
<input type="checkbox"/> English 12 05074		OR	OR	<input type="checkbox"/> Health ½ unit 18010					
		<input type="checkbox"/> Biology 13020	<input type="checkbox"/> Problems of Democracy 1 unit 15201						
		<input type="checkbox"/> Chemistry 13031							
		<input type="checkbox"/> Physics 13042	Additional units may include:						
			<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		Business Education		School-Based:		Community Based:	
<input type="checkbox"/> Ag Mechanics Technology I 01043	<input type="checkbox"/> Business Technology & Procedures 14079	<input type="checkbox"/> SkillsUSA	<input type="checkbox"/> Mentorship				
<input type="checkbox"/> Ag Mechanics Technology II 01044	<input type="checkbox"/> Database 14026	<input type="checkbox"/> TSA	<input type="checkbox"/> Volunteer				
<input type="checkbox"/> Ag Mechanics Power Systems 01045	<input type="checkbox"/> Spreadsheets 14025	<input type="checkbox"/> FFA	<input type="checkbox"/> Part-time Employment				
<input type="checkbox"/> Agricultural Welding & Fabrication 01046	<input type="checkbox"/> Business Fundamentals 14230	<input type="checkbox"/> FCCLA	<input type="checkbox"/> Service-Learning Project				
<input type="checkbox"/> Advanced Ag Welding & Fabrication 01047		<input type="checkbox"/> DECA	<input type="checkbox"/> Job Shadow				
	Trade, Industry & Technical Education	<input type="checkbox"/> FBLA	<input type="checkbox"/> Internship				
Technology & Engineering Education	<input type="checkbox"/> Automated Manufacturing 17113	<input type="checkbox"/> Career Research					
<input type="checkbox"/> Engineering Design 10415	<input type="checkbox"/> Drafting Technology I 17130	<input type="checkbox"/> Cooperative Work Experience					
<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	Certificate or Associate's Degree	Bachelor's Degree	Master's Degree or More
Health, Safety & Environmental Assurance	<input type="checkbox"/> Environmental Technology/Science transfer (NHSC, SBC, UTTC)	<input type="checkbox"/> Emergency Management (NDSU) <input type="checkbox"/> Environmental Design (NDSU) <input type="checkbox"/> Environmental Health (DSU) <input type="checkbox"/> Environmental Science (DSU, NHSC, SBC, UTTC, UND, VCSU)	<input type="checkbox"/> Emergency Management (NDSU) <input type="checkbox"/> Environmental and Conservation Sciences (NDSU, SBC) <input type="checkbox"/> Environmental Engineering (UND)
Logistics & Inventory Control	<input type="checkbox"/> Information Technology (DCB) <input type="checkbox"/> Information Processing Specialist (BSC) <input type="checkbox"/> Management Information Systems (NDSCS)	<input type="checkbox"/> Business Process Integration Management (VCSU) <input type="checkbox"/> Computer Technology Management (DSU) <input type="checkbox"/> Management Information Systems (MISU, NDSU) <input type="checkbox"/> Operations and Supply Chain Management (UND)	<input type="checkbox"/> Supply Chain Management (NDSU) <input type="checkbox"/> Transportation and Urban Systems (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/Telecommunications Technology (BSC) <input type="checkbox"/> Mechanical Maintenance Technology (BSC) <input type="checkbox"/> Mechanical Systems (NDSCS) <input type="checkbox"/> Simulation Technology (LRSC) <input type="checkbox"/> Welding Technology (BSC, BJCC, LRSC, LW, NDSCS, NHSC, SBC, TMCC, UTTC, WSC) <input type="checkbox"/> Wind Energy Technician (LRSC)		
Manufacturing Process Production Development	<input type="checkbox"/> Instrumentation & Control Technology (BSC) <input type="checkbox"/> Power Plant Technology (BSC, TMCC) <input type="checkbox"/> Process Plant Technology (BSC, TMCC) <input type="checkbox"/> Energy Services & Renewable Technician (BSC)	<input type="checkbox"/> Industrial Engineering and Management (NDSU) <input type="checkbox"/> Manufacturing Engineering (NDSU)	<input type="checkbox"/> Industrial Engineering and Management (NDSU) <input type="checkbox"/> Manufacturing Engineering (NDSU)
Production	<input type="checkbox"/> Heating, Ventilation, and Air Conditioning (BSC, NDSCS, TMCC) <input type="checkbox"/> Precision Machining Technology (NDSCS) <input type="checkbox"/> Robotics, Automation and Mechatronics Technology (NDSCS) <input type="checkbox"/> Welding Technology (BSC, BJCC, LRSC, 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

BSC	Bismarck State College	www.bismarckstate.edu	NDSU	ND State University	www.ndsu.edu
BJCC	Burdick Job Corps Center	http://quentinburdick.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