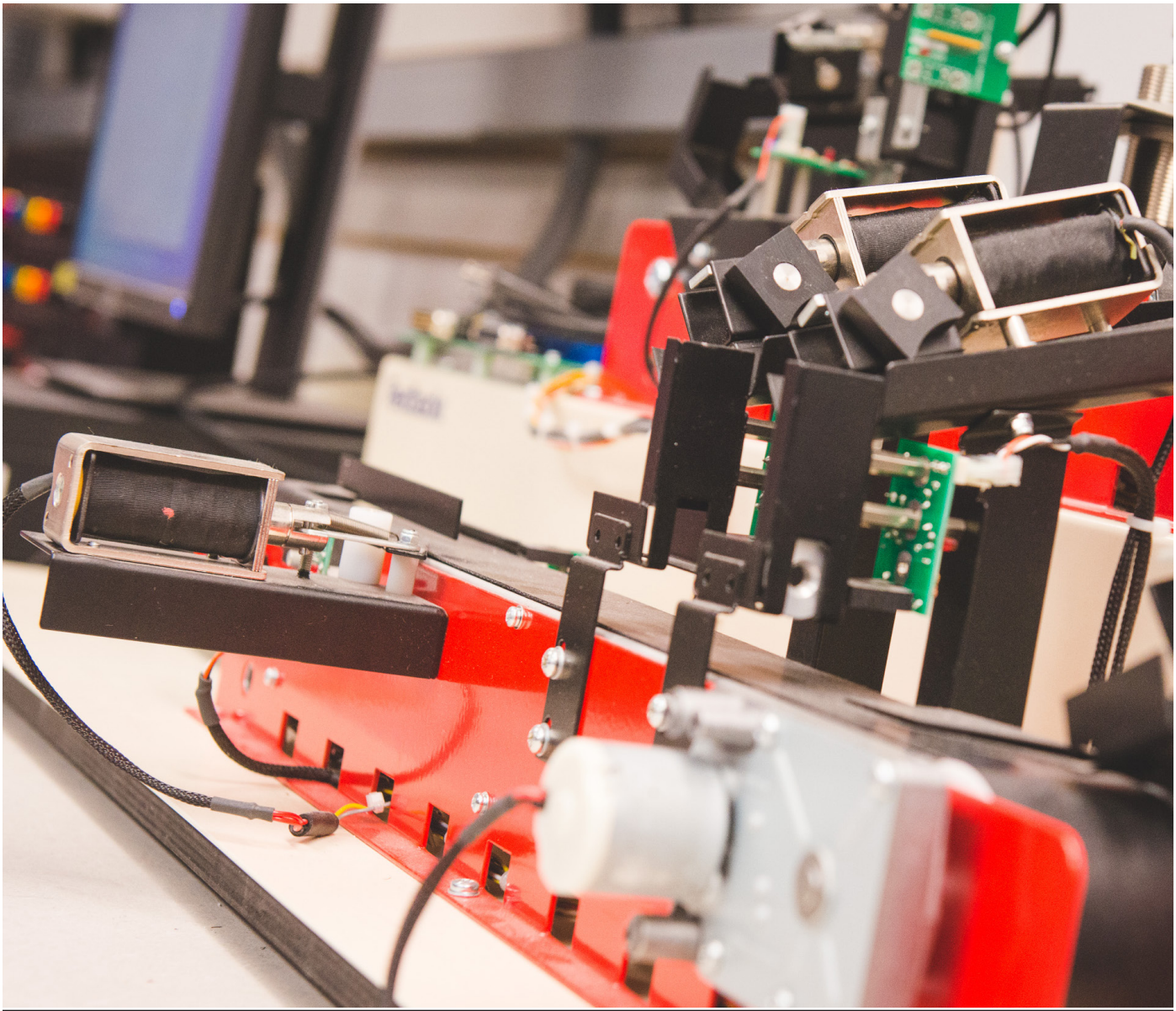

Manufacturing/Machine Technology

Degrees
Industrial Technology, Manufacturing Technology Option, Associate of Science

Certificates
Manufacturing Technology, Certificate of Achievement

Basic Machine Tool Operations-Lathe, Mill, Job Skills Certificate
Computer Numerical Control Programming, Job Skills Certificate

Industrial Technology, Manufacturing Technology Option, Associate of Science Degree

This program teaches students the spectrum of tools utilized in the manufacturing industry: manual machining, computer-controlled machining (CNC), welding, computer aided design, and mathematics. General education courses may be selected to prepare for career advancement or to help meet transfer requirements for the California State University system.

Program Learning Outcomes
Upon successful completion, the student will:
- demonstrate proficiency in technical skills and safety principles required for employment in the manufacturing industry.
- demonstrate problem solving skills used in manufacturing design and product development.
- demonstrate a deep understanding of the core material required for transfer to a four year university program or for certification in the manufacturing program.

Career Opportunities
Machinist, CNC Operator, CNC Programmer, and drafter/designer.

To Transfer Coursework
A minimum of 24 semester units in the major with a grade of 'C' or better while maintaining a minimum grade point average of at least 2.0 in all California State University transferable coursework.

To Achieve the Associate of Science
Upon completion of graduation requirements and the required degree courses with at least a 'C' grade in each course, the student will be awarded an Industrial Technology, Manufacturing Technology Option Associate of Science degree.

Total Units: 24

Required Core Courses

Course #	Name	Units
MFGT B1AB	Machine Tool Processes	3.0
MFGT B2	CNC Lathe Programming & Operation	3.0
MFGT B3	CNC Mill Programming	3.0
INDR B12	Introduction to Drafting and CAD	2.0
TECM B52	Industrial Math and Quality Control or equivalent	3.0
WELD B1A	Introduction to Oxygen Acetylene Welding and Cutting	2.0
WELD B1B	Introduction to the Welding Processes	2.0
WELD B54A	Blueprint Reading for Welders and Machinists	3.0

Electives - Select at least 3 units from the following:

Course #	Name	Units
INDR B20A	Computer Aided Drafting and Design (CAD)	3.0
INDR B40	Parametric Modeling Fundamentals	3.0
INDT B273	Special Problems in Tool Metal Working	2-3.0
WELD B53AB	Shielded Metal Arc Welding	4.0
WELD B74A	Introduction to GMAW (Gas Metal Arc) and FCAW (Flux Core Arc Welding)	2.0
WELD B74B	Introduction to Gas Tungsten Arc Welding	2.0

Manufacturing Technology Certificate of Achievement

This program teaches students the spectrum of tools utilized in the manufacturing industry: manual machining, computer-controlled machining (CNC), welding, computer aided design, and basic math.

Program Learning Outcomes
Upon successful completion, the student will:
- demonstrate proficiency in technical skills and safety principles required for employment in the manufacturing industry.
- demonstrate problem solving skills used in manufacturing design and product development.
- demonstrate a deep understanding of the core material required for transfer to a four year university program or for certification in the manufacturing program.

To Achieve the Certificate of Achievement
Upon completion of the following courses with at least a 'C' grade in each course, the student will be awarded a Manufacturing Technology Certificate of Achievement.

Total Units: 31-33

Required Core Courses

Course #	Name	Units
MFGT B1AB	Machine Tool Processes	3.0
MFGT B2	CNC Lathe Programming & Operation	3.0
MFGT B3	CNC Mill Programming	3.0
INDR B12	Introduction to Drafting and CAD	2.0
TECM B52	Industrial Math and Quality Control	3.0
	or	
MATH B60	Beginning Algebra or equivalent	5.0
INDT B10	Occupational Readiness or equivalent	3.0
WELD B1A	Introduction to Oxygen Acetylene Welding and Cutting	2.0
WELD B1B	Introduction to the Welding Processes	2.0
WELD B54A	Blueprint Reading for Welders and Machinists	3.0

Electives - Select at least 7 units from the following:

Course #	Name	Units
INDR B20A	Computer Aided Drafting and Design (CAD)	3.0
INDR B40	Parametric Modeling Fundamentals	3.0
INDT B273	Special Problems in Tool Metal Working	2-3.0
WELD B74A	Introduction to GMAW (Gas Metal Arc) and FCAW (Flux Core Arc Welding)	2.0
WELD B74B	Introduction to Gas Tungsten Arc Welding	2.0

Basic Machine Tool Operations Lathe, Mill - Job Skills Certificate

This certificate covers the principles of machine tool technology to include the use of precision measuring, drilling machines, saws, lathes and milling machines. Career opportunities include machinist.

Program Learning Outcomes
Upon successful completion, the student will:
- demonstrate proficiency in technical skills and safety principles required for industrial employment.
- demonstrate problem solving skills used in industrial design and product development.
- demonstrate a deep understanding of the core material required for transfer to a four year university program or for certification in the department programs.

To Achieve the Job Skills Certificate
Upon completion of the following courses with at least a 'C' grade in each course, the student will be awarded a Basic Machine Tool Operations - Lathe, Mill Job Skills Certificate.

Total Units: 3
Required Core Courses

Course #	Name	Units
MFGT B1AB	Machine Tool Processes	3.0

Computer Numerical Control Programming, Job Skills Certificate

This certificate covers the principles of set-up, operation and programming of computer numerical control (CNC) lathes and milling machines. Career opportunities include CNC Machinist CNC Programmer and CNC Operator.

Program Learning Outcomes
Upon successful completion, the student will:
- demonstrate proficiency in technical skills and safety principles required for industrial employment.
- demonstrate problem solving skills used in industrial design and product development.
- demonstrate a deep understanding of the core material required for transfer to a four year university program or for certification in the department programs.

To Achieve the Job Skills Certificate
Upon completion of the following courses with at least a 'C' grade in each course, the student will be awarded a Computer Numerical Control Programming Job Skills Certificate.

Total Units: 6
Required Core Courses

Course #	Name	Units
MFGT B2	CNC Lathe Programming & Operation	3.0
MFGT B3	CNC Mill Programming	3.0

Manufacturing Metal Fabrication Technology Associate of Science

The Associate of Science Degree in Manufacturing Metal Fabrication Technology (MMFT) will prepare students for entry level positions within sheet metal trade with specific skills in layout, fabrication, and assembly. The (AS) Degree is designed to provide the student with the type technical competencies required to meet the demands of the metal fabrication industries.

Program Learning Outcomes

Upon successful completion, the student will:

- Be able to perform sheet metal layout.
- Be able to perform common fabrication of a project.
- Be able to perform common metal fabrication using power machinery to produce a fabrication project.
- Be able to demonstrate the ability to read and interpret construction blueprints.

To Achieve the Associate of Science

In addition to the required general education pattern, students must complete the core courses listed below, for the Associate of Science in Manufacturing Metal Fabrication, Industrial Technology. Students must also obtain a minimum grade point average of 2.0 with a grade of C or higher in all courses required for the major. A "P" (Pass) grade is not an acceptable grade for courses in this major.

Total Units: 32

Required Core Courses

Course #	Name	Units
INDR B12	Introduction to Drafting and CAD	3.0
INDT B10	Industrial Technology Careers	3.0
MFGT B1AB	Machine Tool Processes	3.0
MFGT B54	Power Metalworking Machine Operations	3.0
MFGT B51	Advanced Metal Fabrication and Layout Skills	3.0
MFGT B56	CNC Metal Fabrication Systems	3.0
OSRM B10	Occupational Safety	3.0
WELD B1B	Introduction to the Welding Processes	2.0
WELD B54A	Blueprint Reading for Welders and Machinists	3.0
WELD B54B	Template Development and Layout for the Welder	3.0
WELD B65AB	Welded Steel Structures	3.0