Technical Certificate Requirements

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENV 102 Safety Orientation (OSHA 10)</td>
<td>1</td>
<td>MTT 130 Special Projects</td>
<td>3</td>
</tr>
<tr>
<td>MAT 101 Technical Math</td>
<td>3</td>
<td>MTT 215 Machining II</td>
<td>3</td>
</tr>
<tr>
<td>MTT 111 Bench Work</td>
<td>1</td>
<td>MTT 232 CNC Mill Operations</td>
<td>3</td>
</tr>
<tr>
<td>MTT 116 Print Reading</td>
<td>3</td>
<td>MTT 233 CNC Lathe Operations</td>
<td>3</td>
</tr>
<tr>
<td>MTT 122 Quality Control and Inspections</td>
<td>1</td>
<td>MTT 242 Feature Cam Mills</td>
<td>3</td>
</tr>
<tr>
<td>MTT 140 Machining I</td>
<td>3</td>
<td>MTT 243 Feature Cam Lathes</td>
<td>3</td>
</tr>
<tr>
<td>MTT 210 Metallurgy</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTT 230 CNC Operations</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTT 235 Workplace Ethics</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester Total</td>
<td>18</td>
<td>Semester Total</td>
<td>18</td>
</tr>
<tr>
<td>Total Technical Education Credits</td>
<td>36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Associate of Applied Science Degree

Required Technical Courses

Machine Tool Technology Technical Certificate 36

Related Technical Electives

Any Computer Aided Drafting, Electronic Engineering, Welding 9

General Education (course numbers 100 or above)

Verbal Communications 3
Written Communications 3
Mathematics, and/or Computer Science 6
Social Sciences and/or Humanities and Fine Art 3

Technical Certificate 36
Related Technical Electives 9
General Education 15
Total AAS Credits 60

Admission Criteria

- Successfully complete applicable preadmission testing and/or advising

Machinists are an integral part of the manufacturing process. Because the technology of machining is changing rapidly, machinists must learn to operate a wide range of machines. Some newer machines use lasers, water jets, or electrified wires to cut the piece of material—generally different types of metals, plastics, or woods. They use lathes, milling machines, and machining centers, to produce precision metal parts. Although they may produce large quantities of one part, they often produce one-of-a-kind items. Machinists plan and carry out the operations needed to make products that meet precise specifications laid out by drafters, architects, engineers, and
programmers, or mechanics who must fabricate a part or product. Salina Tech’s nine-month program with hands-on learning opportunities includes CNC machine, lathe, and milling process learning that prepares competitive graduates for today’s machining industries.

**Career Opportunities:** Assembly Person, Machine Operator, Machinist, Tool and Die Maker, Tool Room Technician, Methods and Standards, Quality Control, CNC Operator, CNC Programmer, Management acquisition, job retention, job advancement and professional image skills.

---

**Course Descriptions**

**ENV 102 Safety Orientation (OSHA-10), 1 credit.**
This course provides students with an understanding of current safety regulations, established safety practices, hazard recognition, and the impact of behavior and environment on injury prevention.

**MAT 101 Technical Math, 3 credits.**
This is an overview of mathematics course that focuses on technical applications. Topics include basic quantitative problem solving, algebra with technical applications, measurement, proportions, and geometry. This course is designed with the mathematical background necessary for entering technical career fields.

**MTT 111 Bench Work, 1 credit. (Prerequisite: ENV 102)**
Students will be provided the opportunity to learn and practice benchwork skills such as filing, drilling, tapping, deburring and layout for projects. They will gain valuable practical experience in the use of various hand tools by producing basic benchwork projects. Topics will include safety, print reading, job planning, and quality control.

**MTT 116 Print Reading, 3 credits. (Prerequisite: ENV 102)**
Students will learn to identify basic lines, views and abbreviations used in blueprints, interpret basic 3D sketches using orthographic projections and blueprints, determine dimensions of features of simple parts, sketch simple parts with dimensional measurements, determine dimensions of a multi-feature part, interpret GDT symbols, frames and datums.

**MTT 122 Quality Control and Inspection, 1 credit. (Prerequisite: ENV 102)**
Students are introduced to the science of dimensional metrology and its applications to ensure form and function of machined parts and assemblies using semi-precision and precision measuring instruments.

**MTT 130 Special Projects, 3 credits. (Prerequisite: ENV 102)**
This is an advanced course designed for students to apply their knowledge and skills to various types of machining projects. Students must meet exact verbal specifications, sketch the verbal specifications if no blueprints provided and/or produce machined parts from blueprints.

**MTT 140 Machining I, 3 credits. (Prerequisites: ENV 102, MTT 116, MTT 122)**
Students will learn to conduct job hazard analysis for conventional mills and lathes, develop math skills for machine tool operations, perform preventive maintenance and housekeeping on conventional mills and lathes, select work holding devices for mills, lathes and other machine tools, calculate feeds and speeds, remove material using milling and turning processes, align milling head, use a vertical mill to center drill, drill and ream holes, change tools and tool holders on milling machines, and maintain saws and grinders.
MTT 210 Metallurgy, 1 credit.
Students learn the metallurgical terms and definitions in an effort to understand the behavior and service of metals in industry. Characteristics during heating, cooling, shaping, forming, and the stress related to their mechanical properties are covered, as well as the theory behind alloys, heat treatment processes and wear resistance.

MTT 215 Machining II, 3 credits. (Prerequisite: MTT 140)
Students learn to perform basic trigonometric functions, and perform other procedures such as I.D. boring and facing operations, planning a sequence for machining operations, aligning work pieces, use work holding devices, jigs and fixtures, performing threading operations on lathes, machining keyways on a vertical mill, inspecting and dressing grinding wheels, performing O.D. and I.D. tapering operations, machining parts using milling cutters and milling machines, and tapping holes on a vertical mill.

MTT 230 CNC Operations, 3 credits. (Prerequisite: ENV 102)
Students become acquainted with the history of Numerical Control (NC) and Computer Numerical Control (CNC) machines and will be introduced to a CNC machine used in the precision machining trades.

MTT 232 CNC Mill Operations, 3 credits (Prerequisite: MTT 230)
While working in the laboratory or on the job, students identify the safety guidelines and principles of numerically controlled machining. Students demonstrate an understanding of the coordinate system used in numerical control, basic axis movements, NC machine operations, cutter center line offsets, the NC programming process, and programming codes.

MTT 233 CNC Lathe Operations, 3 credits. (Prerequisite: MTT 230)
While working in the laboratory or on the job, students identify the safety guidelines and principles of numerically controlled machining. Students demonstrate an understanding of the coordinate system used in numerical control, basic axis movements, NC machine operations, cutter center line offsets, the NC programming process, and programming codes.

MTT 235 Workplace Ethics, 3 credits.
Students study human relations and professional development that exists in today’s rapidly changing world so that they become better prepared for living and working in a complex society. Topics include human relations, job acquisition, job retention, job advancement, and professional image skills.

MTT 242 Feature CAM Mills, 4 credits. (Prerequisite: MTT 230)
Students generate parts using features such as a tapped hole, a boss, or a turned groove and the operations are automatically created. Students manage the details of the manufacturing processes such as tool selection, speed and feed rates, and tool paths.

MTT 243 Feature CAM Lathes, 3 credits. (Prerequisite: MTT 230)
Students generate parts using features such as a turning, boring, or threading and the operations are automatically created. Students also manage the details of the manufacturing processes such as tool selection, speed and feed rates, and tool paths.