Lakeland COMMUNITY COLLEGE

Applied Studies Division

Computer Integrated Manufacturing Technology

- Associate of Applied Science Degree in Computer Integrated Manufacturing Technology
- General Manufacturing Major
- Maintenance and Repair Concentration
- CNC Operator Mini Certificate
- CNC Set-Up and Programming Technology Certificate
- Computer Integrated Manufacturing Technology Certificate
- Industrial Computer Hardware Technician Certificate
- Production Shift Leader/Manufacturing Management Certificate
- Tool and Die Technology Certificate
- Tool Room/Maintenance Machinist Certificate

Opportunity starts HERE
lakelandcc.edu
Career Opportunities

Today’s manufacturing industry is highly computerized and advanced. Mills and factories have gone from hand-held machinery to high-tech, specialized computer programs and robotics that do the projects. It takes highly trained and qualified people to perform the requirements needed in the manufacturing industry today. Northeast Ohio shows very strong job growth in this area and some companies are having difficulties finding enough employees to fill open positions.

Lakeland’s Program

The general manufacturing major prepares students for employment as engineering technicians at the operations level in manufacturing industries having a concentration in computer applications. Technicians assist in the design and implementation of manufacturing process systems that include numerical control equipment, computer aided part programming, computer aided manufacturing, factory automation, and flexible manufacturing cells and systems.

The maintenance and repair concentration prepares graduates for repairing and maintaining equipment in an industrial environment.

There are also several certificates available that students can choose to supplement their learning.

The Lakeland Advantage

- Classes meet today’s technology requirements for the manufacturing industry.
- Faculty members have years of experience working for local companies and update the courses and equipment to keep up with the latest industry trends.
- Students receive hands-on experience to meet or exceed the requirements of today’s manufacturing companies.
- Scholarships may be available to those who qualify.

Lakeland Community College Admission Requirements

For admission into Lakeland, students must be a high school graduate or have obtained a high school diploma equivalency. Please consult Lakeland Community College’s Enrollment Guide (available on Lakeland’s website at lakelandcc.edu/enrollment) for specific admissions requirements and procedures.

For more information

1.800.589.8520 • lakelandcc.edu
Barb Friedt
Dean for Applied Studies
Cynthia Millonzi
Senior Secretary for Applied Studies
440.525.7085
cmillonzi@lakelandcc.edu

Lakeland’s Computer Integrated Manufacturing Technology degree program prepares students for employment in a variety of manufacturing industries. There are two choices available to students in this degree program:

- General Manufacturing Major (AWT)
- Maintenance and Repair Concentration (AWT, ArcelorMittal)

Both degrees are approved by the AWT (Alliance for Working Together http://thinkmfg.com/) to meet employment needs throughout the Alliance in Northeast Ohio. The Maintenance and Repair Concentration also offers an option for becoming a mechanical maintenance and repair technician at ArcelorMittal Cleveland.

Students are reminded of the college’s policy requiring students in associate of applied science programs to have a “C” grade or better in their applicable technical courses. Students who are concerned about their grades should consult with the Counseling Office or the department chair for the approved list of technical courses for their specified degree program.

Certificates are also available.
General Manufacturing Major (9430)

Associate of Applied Science Degree

The General Manufacturing major prepares students for employment as engineering technicians at the operations level in manufacturing industries having a concentration in computer applications. Technicians assist in the design and implementation of manufacturing process systems that include numerical control equipment, computer aided part programming, computer aided manufacturing, factory automation, and flexible manufacturing cells and systems.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
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<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1110 or ENGL 1111</td>
<td>English Composition I (A) ¹</td>
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<td>ENGR 1000 or ENGS 1000</td>
<td>Introduction to Engineering Technology</td>
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<tr>
<td>FYEX 1000</td>
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<td>1st 8 weeks</td>
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<tr>
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<td>Computer Numerical Control Part Programming (CNC)</td>
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<td>2nd 8 weeks</td>
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<td>Introduction to AutoCAD</td>
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<td>CIMN 1210</td>
<td>Materials Processing</td>
<td>3</td>
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<tr>
<td>CIMN 1450</td>
<td>Programming CNC Lathes</td>
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<tr>
<td>CIMN 1460</td>
<td>Programming CNC Machining Centers</td>
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<tr>
<td>ENGL 1120 or BUSM 2400</td>
<td>English Composition II or Business Communication</td>
<td>3</td>
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<tr>
<td>MATH 1180</td>
<td>Technical Mathematics I</td>
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<td>CADT 2100</td>
<td>Introduction to SolidWorks</td>
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<td>CIMN 2190</td>
<td>Manufacturing Methods and Costs</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 2240</td>
<td>Jig and Fixture Design</td>
<td>2</td>
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<tr>
<td>COMM 1000 or COMM 1100</td>
<td>Effective Public Speaking or Effective Interpersonal Communications</td>
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<td>PHYS 1550</td>
<td>Everyday Physics</td>
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<td>Introduction to Business or Business Ethics</td>
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<td>CIMN 2875</td>
<td>Design and Manufacturing Capstone</td>
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<td>QENT 1200</td>
<td>Quality Concepts and Techniques</td>
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<td>Select course(s) from the Arts and Humanities Electives list</td>
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<tr>
<td>Select course(s) from the Social and Behavioral Sciences Electives list</td>
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<td>Total Credit Hours</td>
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¹ English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.
## Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td><strong>Arts and Humanities</strong></td>
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<tr>
<td>ARTS 1120</td>
<td>Art Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>ARTS 2220</td>
<td>Survey of Art I</td>
<td>3</td>
</tr>
<tr>
<td>ARTS 2230</td>
<td>Survey of Art II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 2250</td>
<td>Survey of American Literature I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 2260</td>
<td>Survey of American Literature II</td>
<td>3</td>
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<td>ENGL 2280</td>
<td>Survey of British Literature I</td>
<td>3</td>
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<tr>
<td>ENGL 2290</td>
<td>Survey of British Literature II</td>
<td>3</td>
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<tr>
<td>HUMX 1100</td>
<td>Introduction to Humanities</td>
<td>3</td>
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<tr>
<td>HUMX 1200</td>
<td>The American Experience in the Arts</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 1200</td>
<td>Music Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 1215</td>
<td>World Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 1800</td>
<td>Popular Music: Rock, Jazz, Country, and Hip-Hop</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 2200</td>
<td>Music History and Literature I</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 2250</td>
<td>Music History and Literature II</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 1500</td>
<td>Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 2000</td>
<td>Comparative Religion</td>
<td>3</td>
</tr>
<tr>
<td>PHOT 1000</td>
<td>History of Photography</td>
<td>3</td>
</tr>
<tr>
<td><strong>Social and Behavioral Sciences</strong></td>
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<td></td>
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<tr>
<td>ANTH 1160</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ECON 1150</td>
<td>Basic Economics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2500</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2600</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 1500</td>
<td>Introduction to Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 1600</td>
<td>World Regional Geography</td>
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<tr>
<td>HIST 1150</td>
<td>Western Civilization I: Antiquity Through the Reformation</td>
<td>3</td>
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<tr>
<td>HIST 1250</td>
<td>Western Civilization II: Age of Revolution Through the Present</td>
<td>3</td>
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<tr>
<td>HIST 2150</td>
<td>U.S. History: Colonization Through Reconstruction</td>
<td>3</td>
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<tr>
<td>POLS 1300</td>
<td>U.S. National Government</td>
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<tr>
<td>POLS 2500</td>
<td>Modern Political Ideologies</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 1500</td>
<td>Introduction to Psychology</td>
<td>3</td>
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<tr>
<td>SOCY 1150</td>
<td>Principles of Sociology</td>
<td>3</td>
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</tbody>
</table>
The Maintenance and Repair Concentration prepares graduates for repairing and maintaining equipment in an industrial environment.

The AWT option is designed to meet AWT employment needs throughout the Alliance in Northeast Ohio. See http://thinkmfg.com/.

The ArcelorMittal Endorsed Option for the Maintenance and Repair Concentration (ArcelorMittal Steelworker for the Future Program) is for students wanting a career as a maintenance technician mechanical at ArcelorMittal Cleveland. The Steelworker for the Future program is a partnership with Lakeland Community College, ArcelorMittal Cleveland, and the United Steelworkers Local 979 designed to prepare students for successful careers as mechanical maintenance or electrical maintenance technicians in the steel industry. Steelworker for the Future is an estimated 2.5-year program that includes four semesters of classroom training, plus up to 16 weeks of paid on-the-job (co-op) training at ArcelorMittal Cleveland for students who pass the company’s hiring requirements. Students will earn an Associate of Applied Science (AAS) degree and can be eligible for hire at ArcelorMittal upon completion of the program. (Students are not required to work for ArcelorMittal, nor are they guaranteed employment at ArcelorMittal.) For more information about the program and to apply go to http://steelworkerforthefuture.com/

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Title</strong></td>
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<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
</tr>
<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
</tr>
<tr>
<td>ENGL 1110 or ENGL 1111</td>
<td>English Composition I (A) or English Composition I (B)</td>
</tr>
<tr>
<td>ENGR 1000</td>
<td>Introduction to Engineering Technology</td>
</tr>
<tr>
<td>FYEX 1000</td>
<td>First Year Experience</td>
</tr>
<tr>
<td>MATH 1080</td>
<td>Introduction to Technical Mathematics</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
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</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
</tr>
<tr>
<td>CIMN 1160</td>
<td>Applied Electricity</td>
</tr>
<tr>
<td>CIMN 1210</td>
<td>Materials Processing</td>
</tr>
<tr>
<td>MATH 1180</td>
<td>Technical Mathematics I</td>
</tr>
<tr>
<td>MECT 1150</td>
<td>Technical Communications</td>
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<td>PHYS 1200</td>
<td>Applied Physics Heat and Thermodynamics</td>
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<td>Select course(s) from the Technical Electives list</td>
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<tr>
<td><strong>Third Semester</strong></td>
<td></td>
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<tr>
<td>COMM 1000 or COMM 1100</td>
<td>Effective Public Speaking or Effective Interpersonal Communications</td>
</tr>
<tr>
<td>MECT 2150</td>
<td>Power Transmission</td>
</tr>
<tr>
<td>PHYS 1100</td>
<td>Applied Physics Mechanics</td>
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<tr>
<td>Select courses(s) from the Arts and Humanities Electives list</td>
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<tr>
<td>Select course(s) from the Technical Electives list</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
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<tr>
<td>CIMN 2390</td>
<td>Fluid Power Technology</td>
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<td>Repair and Maintenance Capstone</td>
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<td>QENT 1200</td>
<td>Quality Concepts and Techniques</td>
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<tr>
<td>Select course(s) from the Social and Behavioral Sciences Electives list</td>
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<tr>
<td>Select course(s) from the Technical Electives list</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
</tr>
</tbody>
</table>
English course selection is based on placement test results (ENGL 1111 English Composition I (B) is 4 credits, only 3 credits apply to the degree).

The co-op experience(s) with a company in the AWT will have a maximum of 2 credits.

There are two co-op experiences, each with ArcelorMittal, for a maximum of 2 credits.

There is a maximum of 2 credits for ENGR 2800.

ี้ This course is designated as a technical course in the program. Students must earn a "C" grade or higher in the course to fulfill the college's graduation requirements policy.

### Technical Electives: minimum 12 credits

Students are required to develop an area of emphasis in the program through the selection of technical electives. Options include:

- Maintenance and Repair Option
- AWT Endorsed Option (Alliance for Working Together Consortium)
- ArcelorMittal Endorsed Option

The **Maintenance and Repair Option** requires the following elective course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MECT 1600</td>
<td>Geometric Dimensioning and Tolerancing ี้</td>
<td>2</td>
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The **AWT Endorsed Option** requires all of the following elective courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MECT 1600</td>
<td>Geometric Dimensioning and Tolerancing ี้</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 2800</td>
<td>Engineering Co-op Experience ี้</td>
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The **ArcelorMittal Endorsed Option** requires all of the following elective courses:

<table>
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<tr>
<th>Course</th>
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<th>Credit Hours</th>
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<tr>
<td>ENGR 2800</td>
<td>Engineering Co-op Experience ี้</td>
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<tr>
<td>ENGR 2800</td>
<td>Engineering Co-op Experience ี้</td>
<td>4</td>
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<tr>
<td>WELD 1300</td>
<td>Thermal Cutting, Gouging, Brazing, and Soldering ี้</td>
<td>2</td>
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<tr>
<td>WELD 1320</td>
<td>Basic SMAW (Stick) Welding ้</td>
<td>2</td>
</tr>
<tr>
<td>WELD 1330</td>
<td>Basic GTAW (TIG) Welding ้</td>
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<tr>
<td>WELD 1340</td>
<td>Basic FCAW (Flux Cored) and GMAW (MIG/MAG) Welding ้</td>
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Students are required to choose the remaining technical electives from the following list of courses:

<table>
<thead>
<tr>
<th>Course</th>
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<td>Advanced AutoCAD ้</td>
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<tr>
<td>CADT 2100</td>
<td>Introduction to SolidWorks ้</td>
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<tr>
<td>CADT 2500</td>
<td>Advanced SolidWorks ้</td>
<td>3</td>
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<tr>
<td>CIMN 1420</td>
<td>Computer Numerical Control Part Programming (CNC) ้</td>
<td>2</td>
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<tr>
<td>CIMN 1430</td>
<td>Introduction to Computer Assisted Part Programming ้</td>
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<td>CIMN 1450</td>
<td>Programming CNC Lathes ้</td>
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<td>CIMN 1460</td>
<td>Programming CNC Machining Centers ้</td>
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<tr>
<td>CIMN 2190</td>
<td>Manufacturing Methods and Costs ้</td>
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<td>CIMN 2240</td>
<td>Jig and Fixture Design ้</td>
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<td>CNET 1100</td>
<td>Cisco Networking Technology I ้</td>
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<td>Cisco Networking Technology II ้</td>
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<td>CNET 1300</td>
<td>Cisco Networking Technology III ้</td>
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<td>CPET 1120</td>
<td>C Programming for Engineering Technology ้</td>
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<td>ENGR 2800</td>
<td>Engineering Co-op Experience ้</td>
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<td>WELD 1300</td>
<td>Thermal Cutting, Gouging, Brazing, and Soldering ้</td>
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<tr>
<td>WELD 1320</td>
<td>Basic SMAW (Stick) Welding ้</td>
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<td>WELD 1340</td>
<td>Basic FCAW (Flux Cored) and GMAW (MIG/MAG) Welding ้</td>
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<tr>
<td>WELD 1370</td>
<td>Basic Pipe Welding ้</td>
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## Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>Arts and Humanities Electives</strong></td>
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<tr>
<td>ARTS 1120</td>
<td>Art Appreciation</td>
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<tr>
<td>ARTS 2220</td>
<td>Survey of Art I</td>
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<td>ARTS 2230</td>
<td>Survey of Art II</td>
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<tr>
<td>ENGL 2250</td>
<td>Survey of American Literature I</td>
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<td>ENGL 2260</td>
<td>Survey of American Literature II</td>
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<td>Survey of British Literature I</td>
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<td>ENGL 2290</td>
<td>Survey of British Literature II</td>
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<td>HUMX 1100</td>
<td>Introduction to Humanities</td>
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<tr>
<td>HUMX 1200</td>
<td>The American Experience in the Arts</td>
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<td>Music Appreciation</td>
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<td>MUSC 1215</td>
<td>World Music</td>
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<td>MUSC 1800</td>
<td>Popular Music: Rock, Jazz, Country, and Hip-Hop</td>
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<td>MUSC 2200</td>
<td>Music History and Literature I</td>
<td>3</td>
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<td>MUSC 2250</td>
<td>Music History and Literature II</td>
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<tr>
<td>PHIL 1500</td>
<td>Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 2000</td>
<td>Comparative Religion</td>
<td>3</td>
</tr>
<tr>
<td>PHOT 1000</td>
<td>History of Photography</td>
<td>3</td>
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<tr>
<td><strong>Social and Behavioral Sciences Electives</strong></td>
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<td></td>
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<tr>
<td>ANTH 1160</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
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<tr>
<td>ECON 1150</td>
<td>Basic Economics</td>
<td>3</td>
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<tr>
<td>ECON 2500</td>
<td>Principles of Macroeconomics</td>
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<td>GEOG 1500</td>
<td>Introduction to Geography</td>
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<td>GEOG 1600</td>
<td>World Regional Geography</td>
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<tr>
<td>HIST 1150</td>
<td>Western Civilization I: Antiquity Through the Reformation</td>
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<tr>
<td>HIST 1250</td>
<td>Western Civilization II: Age of Revolution Through the Present</td>
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<tr>
<td>HIST 2150</td>
<td>U.S. History: Colonization Through Reconstruction</td>
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<tr>
<td>HIST 2250</td>
<td>U.S. History: Reconstruction to the Present</td>
<td>3</td>
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<td>POLS 1300</td>
<td>U.S. National Government</td>
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<td>POLS 2500</td>
<td>Modern Political Ideologies</td>
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<td>PSYC 1500</td>
<td>Introduction to Psychology</td>
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<tr>
<td>SOCY 1150</td>
<td>Principles of Sociology</td>
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# CNC Operator Mini Certificate (4315)

**NOTE:** Some courses in this certificate are available only on weekends.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1050</td>
<td>Manufacturing Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1420</td>
<td>Computer Numerical Control Part Programming (CNC)</td>
<td>2</td>
</tr>
<tr>
<td>CIMN 1450</td>
<td>Programming CNC Lathes</td>
<td>2</td>
</tr>
<tr>
<td>CIMN 1460</td>
<td>Programming CNC Machining Centers</td>
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</tr>
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<td><strong>Total Credit Hours</strong></td>
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# CNC Set-Up and Programming Technology Certificate (4312)

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<th>Title</th>
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<tbody>
<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CADT 2100</td>
<td>Introduction to SolidWorks</td>
<td>3</td>
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<td>Manufacturing Fundamentals</td>
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<td>CIMN 1110</td>
<td>Machining Processes</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1420</td>
<td>Computer Numerical Control Part Programming (CNC)</td>
<td>2</td>
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<tr>
<td>CIMN 1430</td>
<td>Introduction to Computer Assisted Part Programming</td>
<td>2</td>
</tr>
<tr>
<td>CIMN 1450</td>
<td>Programming CNC Lathes</td>
<td>2</td>
</tr>
<tr>
<td>CIMN 1460</td>
<td>Programming CNC Machining Centers</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 1000</td>
<td>Introduction to Engineering Technology</td>
<td>2</td>
</tr>
<tr>
<td>MECT 1150</td>
<td>Technical Communications</td>
<td>3</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
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# Computer Integrated Manufacturing Technology Certificate (4311)

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<thead>
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<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1050</td>
<td>Manufacturing Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1210</td>
<td>Materials Processing</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1420</td>
<td>Computer Numerical Control Part Programming (CNC)</td>
<td>2</td>
</tr>
<tr>
<td>CIMN 1430</td>
<td>Introduction to Computer Assisted Part Programming</td>
<td>2</td>
</tr>
<tr>
<td>CIMN 2190</td>
<td>Manufacturing Methods and Costs</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 2240</td>
<td>Jig and Fixture Design</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 1000</td>
<td>Introduction to Engineering Technology</td>
<td>2</td>
</tr>
<tr>
<td>MECT 1150</td>
<td>Technical Communications</td>
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</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
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## Industrial Computer Hardware Technician Certificate (4241)

**NOTE:** CPET 1050 Assembling, Upgrading and Repairing Personal Computers has a prerequisite of prior exposure to applied technologies or successful completion of the CIM or ET Tech Prep programs.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ENGR 1000</td>
<td>Introduction to Engineering Technology</td>
<td>2</td>
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<tr>
<td>CNET 1100</td>
<td>Cisco Networking Technology I</td>
<td>2</td>
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<tr>
<td>CPET 1050</td>
<td>Assembling, Upgrading and Repairing Personal Computers</td>
<td>2</td>
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<tr>
<td>CPET 1120</td>
<td>C Programming for Engineering Technology</td>
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<tr>
<td>CPET 2050</td>
<td>Advanced Assembly and Repair of Personal Computers</td>
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<tr>
<td>ITON 1070</td>
<td>Operating Systems: Skills and Techniques</td>
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<td>ITON 1205</td>
<td>Network+ and Networking Essentials</td>
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<td>ITON 2080</td>
<td>Supporting Client Operating Systems</td>
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## Production Shift Leader/Manufacturing Management Certificate (4351)

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<tr>
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<tbody>
<tr>
<td>BUSM 1300</td>
<td>Introduction to Business</td>
<td>3</td>
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<tr>
<td>BUSM 1800</td>
<td>Essentials of Management and Supervision</td>
<td>3</td>
</tr>
<tr>
<td>BUSM 2200</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1050</td>
<td>Manufacturing Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1210</td>
<td>Materials Processing</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 2190</td>
<td>Manufacturing Methods and Costs</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 1000</td>
<td>Introduction to Engineering Technology</td>
<td>2</td>
</tr>
<tr>
<td>or ENGS 1000</td>
<td>Introduction to Engineering</td>
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<tr>
<td>MECT 1150</td>
<td>Technical Communications</td>
<td>3</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
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# Tool and Die Technology Certificate (4303)

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<thead>
<tr>
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<th>Title</th>
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<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>CIMN 1050</td>
<td>Manufacturing Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR 1000</td>
<td>or ENGS 1000</td>
<td>Introduction to Engineering Technology</td>
</tr>
<tr>
<td></td>
<td>or Introduction to Engineering</td>
<td>2</td>
</tr>
<tr>
<td><strong>Third Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
<td>3</td>
</tr>
<tr>
<td><strong>Fourth Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECT 1150</td>
<td>Technical Communications</td>
<td>3</td>
</tr>
<tr>
<td><strong>Fifth Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CADT 1500</td>
<td>Advanced AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 2240</td>
<td>Jig and Fixture Design</td>
<td>2</td>
</tr>
<tr>
<td><strong>Sixth Semester</strong></td>
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<td></td>
</tr>
<tr>
<td>CIMN 1210</td>
<td>Materials Processing</td>
<td>3</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
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# Tool Room/Maintenance Machinist Certificate (4302)

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<th>Course</th>
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<tbody>
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<td><strong>First Semester</strong></td>
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<tr>
<td>CIMN 1050</td>
<td>Manufacturing Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR 1000</td>
<td>or ENGS 1000</td>
<td>Introduction to Engineering Technology</td>
</tr>
<tr>
<td></td>
<td>or Introduction to Engineering</td>
<td>2</td>
</tr>
<tr>
<td><strong>Third Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CADT 1100</td>
<td>Introduction to AutoCAD</td>
<td>3</td>
</tr>
<tr>
<td>CIMN 1110</td>
<td>Machining Processes</td>
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</tr>
<tr>
<td><strong>Fourth Semester</strong></td>
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<tr>
<td>CIMN 1210</td>
<td>Materials Processing</td>
<td>3</td>
</tr>
<tr>
<td><strong>Fifth Semester</strong></td>
<td></td>
<td></td>
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<tr>
<td>CIMN 1420</td>
<td>Computer Numerical Control Part Programming (CNC)</td>
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<tr>
<td><strong>Sixth Semester</strong></td>
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<tr>
<td>CIMN 1450</td>
<td>Programming CNC Lathes</td>
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<tr>
<td>CIMN 1460</td>
<td>Programming CNC Machining Centers</td>
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<td><strong>Total Credit Hours</strong></td>
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Quality Education
Professors at Lakeland are experts in their fields with real-world experience. Lakeland prepares you for a high-demand career or for transfer to a four-year college or university. Access to bachelor’s and graduate degrees is available on campus from partner institutions through Lakeland’s Holden University Center (lakelandcc.edu/uc).

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