About the Program

Today’s manufacturing industry uses robots and other advanced fabrication and assembly equipment to produce a wide variety of products. All of these systems rely on digital controls including programmable logic controllers. Mechatronics technicians calibrate, troubleshoot, and repair both the equipment and the controllers. Mechatronic technicians in southern Oregon are needed by manufacturers in the food processing, wood products, and metal fabrication industries. Typical positions include industrial engineering technician and manufacturing maintenance technician. The program can also provide preparation for apprenticeship programs leading to a variety of licensed journey positions.

The Mechatronics degree program trains students to be proficient in troubleshooting mechanical, electrical, pneumatic, and hydraulic equipment and the digital systems that control them. It prepares students for positions in the highly technical manufacturing environment installing, troubleshooting, programming, and maintaining a variety of types of production equipment. Today’s manufacturing environment uses an extensive array of programmable controls, including programmable logic controllers (PLCs), as well as other single function controls using firmware and analog applications. Students learn foundational skills in math, fabrication, and repair as well as hydraulics, electronics, troubleshooting and programming, preparing students for numerous positions in a wide variety of manufacturing facilities. Elective options allow students to focus on either a mechanical or electronics emphasis.

Most of the courses in the program are hands-on, open-lab courses supported by online instruction providing students exceptional flexibility when scheduling around family, employment, or other commitments.

Program Learning Outcomes

The curriculum in RCC courses is derived from a set of identified learning outcomes that are relevant to the discipline. Program learning outcomes for mechatronics programs are:

- Install, troubleshoot, maintain and repair mechatronic systems using industry-standard tools, practices and procedures.
- Assist in design and rebuilding projects.
- Follow, develop, and troubleshoot manufacturing processes and procedures.
- Organize, interpret, and use technical information and documentation.
- Promote energy efficiency and industrial sustainability.
- Demonstrate the ability to adhere to personal and industry safety standards.
- Communicate effectively across a variety of audiences: technicians, engineers, management, and customers.
- Demonstrate life-long learning towards professional growth.

Entry Requirements

Students are required to complete the Placement Process to determine skill level and readiness in math, reading, and writing. As part of their training program, students must begin with the courses within their skill level as determined through the Placement Process. In addition, students may also be required to enroll in classes that would increase their employability and success.

Advanced Standing

Coursework from accredited colleges and universities will be accepted in accordance with college registration policies and with the Manufacturing/Engineering Technology Department chair’s recommendation. In order to ensure that coursework is current, program courses over 10 years old must be reviewed and approved by the appropriate program coordinator before being accepted toward core requirements. Students must complete coursework in their major at a “C” or better level before proceeding to advanced coursework. Each College Now credit student must meet with the program coordinator to determine placement.

Graduation Requirements

Students are required to complete all courses in this program with a grade of “C” or better to receive their degrees. Certain required courses are graded on a pass/no pass basis only. A grade of “P” for these courses indicates a student earned the equivalent of a “C” or better grade.

Prerequisites

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS105</td>
<td>Approved 3-4 credit Computer Science or Computer Information Science class, CS120/CSI120 or above, or documented computer proficiency within the past ten years.</td>
<td>0-4</td>
</tr>
<tr>
<td>MEC102</td>
<td>Basic Hand Tools or demonstrated proficiency</td>
<td>0-3</td>
</tr>
<tr>
<td>MTH63</td>
<td>Applied Algebra I or higher level math</td>
<td>4</td>
</tr>
</tbody>
</table>

WR115 | Introduction to Expository Writing or BT113 Business English I or higher level composition | 3-4 |

Total Prerequisite Credits | 7-15 |

First Year Required Courses

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EET104</td>
<td>Fundamentals of Manufacturing Electronics</td>
<td>4</td>
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<tr>
<td>MEC103</td>
<td>Industrial Safety</td>
<td>1</td>
</tr>
<tr>
<td>MEC110</td>
<td>AC/DC Electrical Systems for Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>MEC125</td>
<td>Pneumatics I</td>
<td>3</td>
</tr>
<tr>
<td>MET105</td>
<td>Blueprint Reading – Mechanical</td>
<td>3</td>
</tr>
<tr>
<td>MFG116</td>
<td>Metrology</td>
<td>2</td>
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<tr>
<td>WR215</td>
<td>Introduction to Expository Writing</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Second Term

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MEC115</td>
<td>Electrical Control Systems and Sensors for Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>MEC124</td>
<td>Hoisting and Rigging</td>
<td>3</td>
</tr>
<tr>
<td>MFG121</td>
<td>Manufacturing Processes I</td>
<td>4</td>
</tr>
<tr>
<td>WLD111</td>
<td>Technology of Industrial Welding I or WLD101 Welding Fundamentals I and WLD102 Welding Fundamentals II</td>
<td>6</td>
</tr>
</tbody>
</table>

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Third Term

- BT101 Human Relations in Organizations or
- PSY101 Psychology of Human Relations 3
- HE112 Emergency First Aid 1
- MEC130 Hydraulics I 3
- MEC135 Mechanical Drives I 4
- MEC149 Electric Motor Control 4

Total First Year Credits 47

Second Year Required Courses

Course No. Course Title Credits

Fourth Term
- MEC150 PLC Motor Control 3
- MEC231 Hydraulics II 4
- MEC236 Mechanical Drives II 4
- —— Approved program elective 3-9

Fifth Term
- GS104 Physical Science with lab or approved program elective 4
- LIB127 Introduction to Academic Research, or LIB101 Introduction to Information Literacy 1
- MEC151 Programming PLC's I 3
- WR121 English Composition I or BT114 Business English II or higher level composition 4
- —— Approved program elective 2-8

Sixth Term
- MEC152 Programming PLC's II 3
- MFG280 Cooperative Work Experience/Manufacturing 4
- —— Approved program electives 8-14

Total Second Year Credits 43-61

TOTAL PROGRAM CREDITS 90-108

Approved Program Electives

(13-31 credits required)

- MEC238 Mechanical Drives III 4
- MET101 Mechanical Drafting 3
- MFG122 Manufacturing Processes II 4
- MFG211 Manufacturing Power and Control Electronics 4
- WLD112 Technology of Industrial Welding II 6
- WLD250A Selected Topics in Welding: FCAW 2
- WLD250B Selected Topics in Welding: GTAW 2
- WLD250C Selected Topics in Welding: SMAW 2
- WLD250D Selected Topics in Welding: GMAW 2
- WLD250P Selected Topics in Welding: CNC Plasma Cutting 3

Electronics Focus

Course No. Course Title Credits

- EET125 Electronics Fundamentals I (DC) 6
- EET129 Introduction to Embedded Systems 3
- EET130 Digital Fundamentals I 6
- EET131 Digital Fundamentals II 6

Robotics Focus

Course No. Course Title Credits

- MEC240 Robotics I 3

1 Required for graduation.

For more information contact the Manufacturing and Engineering Technology Department:
Grants Pass Medford ........................................... 541-245-7902
Toll free in Oregon ............................................. 800-411-6508, Ext. 7902
Web address .................................................... www.roguecc.edu/manufacturing
TTY ......................................................... Oregon Telecom Relay Service, 711

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