

# Mechatronics

Holland code family: Doers

## 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

Course No.	Course Title	Credits
CS/CIS	Approved 3-4 credit Computer Science or Computer Information Science class, CS120/CIS120 or above, or documented computer proficiency within the past ten years. <sup>1</sup>	0-4
MEC102	Basic Hand Tools or demonstrated proficiency	0-3
MTH63	Applied Algebra I or higher level math <sup>1</sup>	4



WR115	Introduction to Expository Writing or BT113 Business English I or higher level composition <sup>1</sup>	3-4
-------	------------------------------------------------------------------------------------------------------------	-----

**Total Prerequisite Credits** **7-15**

## First Year Required Courses

Course No.	Course Title	Credits
<b>First Term</b>		
EET104	Fundamentals of Manufacturing Electronics	4
MEC103	Industrial Safety	1
MEC110	AC/DC Electrical Systems for Manufacturing	3
MEC125	Pneumatics I	3
MET105	Blueprint Reading – Mechanical	3
MFG116	Metrology	2
		16

## Second Term

MEC115	Electrical Control Systems and Sensors for Manufacturing	3
MEC124	Hoisting and Rigging	3
MFG121	Manufacturing Processes I	4
WLD111	Technology of Industrial Welding I or WLD101 Welding Fundamentals I and WLD102 Welding Fundamentals II	6
		16

**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
<b>Fourth Term</b>		
MEC150	PLC Motor Control	3
MEC231	Hydraulics II	4
MEC236	Mechanical Drives II	4
—	Approved program elective	<u>3-9</u>
		14-20

**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	<u>2-8</u>
		14-20

**Sixth Term**

MEC152	Programming PLC's II	3
MFG280	Cooperative Work Experience/Manufacturing	4
—	Approved program electives	<u>8-14</u>
		15-21

**Total Second Year Credits**

**43-61**

**TOTAL PROGRAM CREDITS**

**90-108**

**Approved Program Electives**

(13-31 credits required)

**Mechanical Focus (Hydraulics, PNL, Drives)**

Course No.	Course Title	Credits
MEC114	Safety for Industry	3
MEC116	Quality Practices and Measurement	3
MEC118	Manufacturing Processes and Production	3
MEC120	Maintenance Awareness	4
MEC140	Green Production	2
MEC199	Special Topics: Mechatronics	Var
MEC226	Pneumatics II	3
MEC228	Pneumatic Fittings and Troubleshooting	4
MEC233	Hydraulic Troubleshooting	4

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

<sup>1</sup> Required for graduation.

For more information contact the Manufacturing and Engineering Technology Department:

Grants Pass or Medford. . . . . 541-245-7902

Toll free in Oregon . . . . . 800-411-6508, Ext. 7902

email . . . . . manufacturing@rogucecc.edu

Web address . . . . . www.rogucecc.edu/manufacturing

TTY . . . . . Oregon Telecom Relay Service, 711

This advising guide is for advising purposes only. Please see current college catalog for additional information on specific college policies and graduation requirements.

RCC is an open institution and does not discriminate. For RCC's non-discrimination policy and a full list of regulatory specific contact persons visit the following webpage: [www.rogucecc.edu/nondiscrimination](http://www.rogucecc.edu/nondiscrimination).

