

## Mechatronics Engineering Technology (A40350)

### ENGINEERING AND TECHNOLOGY PATHWAYS

These curriculums are designed to prepare students through the study and application of principles from mathematics, natural sciences, and technology and applied processes based on these subjects.

Course work includes mathematics, natural sciences, engineering sciences and technology.

Graduates should qualify to obtain occupations such as technical service providers, materials and technologies testing services, process improvement technicians, engineering technicians, industrial and technology managers, or research technicians.

### PROGRAM DESCRIPTION

A course of study that prepares the students to use basic engineering principles and technical skills in developing and testing automated, servo-mechanical, and other electromechanical systems. Includes instruction in prototype testing, manufacturing and operational testing, systems analysis and maintenance procedures. Graduates should be qualified for employment in industrial maintenance and manufacturing including assembly, testing, startup, troubleshooting, repair, process improvement, and control systems, and should qualify to sit for Packaging Machinery Manufacturers Institute (PMMI) mechatronics or similar industry examinations.

### COURSE REQUIREMENTS

Richmond Community College provides day and evening course sequences for selected programs to enable students to better plan what courses to take to reach their educational goals. However, given the continued increase in the use of technology in instruction and increasing student demand for distance learning courses, the College may offer hybrid, online, web-based and information highway courses in place of traditional courses in any course sequence that is listed. Therefore, students should be aware of this possibility and prepare themselves to successfully function in a hybrid, online, web-based, or information highway course.

	Class	Lab	Work/ Clinical	Credit
<b>A. General Education Courses</b>				
1. Required Courses				
ENG 111	Writing and Inquiry	3	0	0 3
ENG 112	Writing/Research in the Disciplines	3	0	0 3
MAT 171	Precalculus Algebra	3	2	0 4
	Humanities/Fine Arts Elective*	3	0	0 3
	Social/Behavioral Sciences Elective*	3	0	0 3
<b>B. Major Courses</b>				
1. Core Courses				
<i>To receive a degree, diploma or certificate from RCC, a student must have a grade of "C" or better in all core courses for the program of study.</i>				
ATR 112	Intro to Automation	2	3	0 3
CIS 110	Introduction to Computers	2	2	0 3
DFT 151	CAD I	2	3	0 3
ELC 112	DC/AC Electricity	3	6	0 5
or				

ELC	131	Circuit Analysis I	3	3	0	4
ELC	117	Motors and Controls	2	6	0	4
	or					
ELN	231	Industrial Controls	2	3	0	3
ELC	213	Instrumentation	3	2	0	4
ELN	260	Prog Logic Controllers	3	3	0	4
HYD	110	Hydraulics/Pneumatics I	2	3	0	3
ISC	112	Industrial Safety	2	0	0	2
MEC	130	Mechanisms	2	2	0	3
PHY	151	College Physics I	3	2	0	4
<b>2. Other Major Courses</b>						
ELN	133	Digital Electronics	3	3	0	4
ISC	132	Manufacturing Quality Control	2	2	0	3
MAT	172	Precalculus Trigonometry	3	2	0	4
MEC	110	Intro to CAD/CAM	1	2	0	2
MEC	180	Engineering Materials	2	3	0	3
MNT	240	Industrial Equip Troubleshooting	1	3	0	2
<b>C. Other Required Hours</b>						
ACA	122	College Transfer Success	0	2	0	1

**Total Credit Hours****71-73**

\*Approved Electives are listed on the page before the Course Descriptions.

**SEMESTER SCHEDULE  
MECHATRONICS ENGINEERING TECHNOLOGY**

			Class	Lab	Work/ Clinical	Credit
<b>First Year – Fall Semester</b>						
ACA	122	College Transfer Success	0	2	0	1
CIS	110	Introduction to Computers	2	2	0	3
ELC	112	DC/AC Electricity	3	6	0	5
	or					
ELC	131	Circuit Analysis I	3	3	0	4
ENG	111	Writing and Inquiry	3	0	0	3
MAT	171	Precalculus Algebra	3	2	0	4
			11	9-12	0	15-16
<b>First Year – Spring Semester</b>						
ELC	117	Motors and Controls	2	6	0	4
	or					
ELN	231	Industrial Controls	2	3	0	3
ELN	133	Digital Electronics	3	3	0	4
HYD	110	Hydraulics/Pneumatics I	2	3	0	3
ISC	112	Industrial Safety	2	0	0	2
MAT	172	Precalculus Trigonometry	3	2	0	4

			12	11-14	0	16-17
<b>First Year – Summer Semester</b>						
ENG	112	Writing/Research in the Disciplines	3	0	0	3
		Humanities/Fine Arts Elective*	3	0	0	3
		Social/Behavioral Sciences Elective*	3	0	0	3
			9	0	0	9
<b>Second Year – Fall Semester</b>						
DFT	151	CAD I	2	3	0	3
ELN	260	Prog Logic Controllers	3	3	0	4
ISC	132	Manufacturing Quality Control	2	2	0	3
MEC	130	Mechanisms	2	2	0	3
PHY	151	College Physics I	3	2	0	4
			12	12	0	17
<b>Second Year – Spring Semester</b>						
ATR	112	Intro to Automation	2	3	0	3
ELC	213	Instrumentation	3	2	0	4
MEC	110	Intro to CAD/CAM	1	2	0	2
MEC	180	Engineering Materials	2	3	0	3
MNT	240	Industrial Equip Troubleshooting	1	3	0	2
			9	13	0	14

**Total Credit Hours****71-73**

\*Approved Electives are listed on the page before the Course Descriptions.

**MECHATRONICS ENGINEERING TECHNOLOGY (CERTIFICATE) (C40350)  
COURSE REQUIREMENTS**

			Class	Lab	Work/ Clinical	Credit
ELC	131	Circuit Analysis I	3	3	0	4
ELC	213	Instrumentation	3	2	0	4
ELN	231	Industrial Controls	2	3	0	3
ELN	260	Programmable Logic Controllers	3	3	0	4
ENG	111	Writing and Inquiry	3	0	0	3
			14	11	0	18
<b>Total Credit Hours</b>						<b>18</b>

## Program Completion Guide

## ASSOCIATE IN APPLIED SCIENCE - MECHATRONICS ENGINEERING TECHNOLOGY (A40350)

Student Name: \_\_\_\_\_ ID#: \_\_\_\_\_ Date of Enrollment: \_\_\_\_\_

## Section I: Developmental Courses (if needed)

Courses	Scores	Cr.	Prerequisites/ Corequisites	Grade	Notes/Semester
DMA 010 Operations with Integers	<7 on DAP	1	Pre: None		
DMA 020 Fractions and Decimals	<7 on DAP	1	Pre: DMA 010		
DMA 030 Propor/Ratio/Rate/Percent	<7 on DAP	1	Pre: DMA 010-020		
DMA 040 Express/Lin Equat/Inequal	<7 on DAP	1	Pre: DMA 010-030 or MAT 060		
DMA 050 Graphs/Equations of Lines	<7 on DAP	1	Pre: DMA 010-040 or DMA 040 and MAT 060		
DMA 060 Polynomial/Quadratic Appl (Required if taking MAT 171)	<7 on DAP	1	Pre: DMA 010-050 or MAT 060 and MAT 070		
DMA 070 Rational Express/Equation (Required if taking MAT 171)		1	Pre: DMA 010-060 or MAT 060 and MAT 070		
DMA 080 Radical Express/Equations (Required if taking MAT 171)		1	Pre: DMA 010-070 or MAT 060 and MAT 070		
DRE 096 Integrated Reading and Writing	104-116	3	Pre: None		
DRE 097 Integrated Reading Writing II	117-135	3	Pre: DRE 096		
DRE 098 Integrated Reading Writing III	136-150	3	Pre: DRE 097		

## Section II:

## A. Mechatronics Engineering Technology Certificate (C40350) Course Requirements 18 credit hours: Complete Section I (as required) and Section II, A.

Courses	Cr.	Recommended Semester	Prerequisites/ Corequisites	Semester Registered/ Planned	Semester Completed/ Grade
ELC 131 Circuit Analysis I* (For degree requirements see Section B.)	4	1 <sup>st</sup> year – fall	Pre: DMA 010-050 or MAT 070 Co: DRE 096		
ELC 213 Instrumentation*	4	2 <sup>nd</sup> year – spring	None		
ELN 231 Industrial Controls* (For degree requirements see Section B.)	3	1 <sup>st</sup> year – spring	Pre: ELC 131		
ELN 260 Prog Logic Controllers*	4	2 <sup>nd</sup> year – fall	Pre: ELC 112 or ELC 131		
ENG 111 Writing and Inquiry	3	1 <sup>st</sup> year – fall	Pre: DRE 098 or ENG 090 & RED 090 Co: ACA 122		

## B. Mechatronics Engineering Technology Associate in Applied Science Degree (A40350) Course Requirements 71-73 credit hours: Complete Section I (as required) and Section II, A and B.

Courses	Cr.	Recommended Semester	Prerequisites/ Corequisites	Semester Registered/ Planned	Semester Completed/ Grade
ACA 122 College Transfer Success	1	1 <sup>st</sup> year – fall	None		
CIS 110 Introduction to Computers*	3	1 <sup>st</sup> year – fall	Pre: CIS 070, DRE 097 Co: DRE 098		
ELC 112 DC/AC Electricity* or ELC 131 Circuit Analysis I*	5 4	1 <sup>st</sup> year – fall	Pre: DMA 010 Pre: DMA 010-050 or MAT 070 Co: DRE 096		
MAT 171 Precalculus Algebra	4	1 <sup>st</sup> year – fall	Pre: DMA 010-080 or MAT 080		
ELC 117 Motors and Controls* or ELN 231 Industrial Controls*	4 3	1 <sup>st</sup> year – spring	Pre: ELC 112 or ELC 131 Pre: ELC 131		
ELN 133 Digital Electronics	4	1 <sup>st</sup> year – spring	Pre: ELC 112 or ELC 131		
HYD 110 Hydraulics/Pneumatics I*	3	1 <sup>st</sup> year – spring	Pre: DMA 010-030 or MAT 060		
ISC 112 Industrial Safety*	2	1 <sup>st</sup> year – spring	None		
MAT 172 Precalculus Trigonometry	4	1 <sup>st</sup> year – spring	Pre: MAT 171		

ENG 112 Writing/Research in the Disciplines	3	1 <sup>st</sup> year – summer	Pre: ENG 111		
DFT 151 CAD I*	3	2 <sup>nd</sup> year – fall	Pre: DMA 010-030 or MAT 060, DRE 097 or RED 080		
ISC 132 Manufacturing Quality Control	3	2 <sup>nd</sup> year – fall	None		
MEC 130 Mechanisms*	3	2 <sup>nd</sup> year – fall	Pre: DMA 010-020 or MAT 060		
PHY 151 College Physics I*	4	2 <sup>nd</sup> year – fall	Pre: DRE 098 or RED 090, MAT 171		
ATR 112 Intro to Automation*	3	2 <sup>nd</sup> year – spring	Pre: ELN 260		
ELC 213 Instrumentation*	4	2 <sup>nd</sup> year – spring	None		
MEC 110 Intro to CAD/CAM	2	2 <sup>nd</sup> year – spring	Pre: DMA 010-020 or MAT 060		
MEC 180 Engineering Materials	3	2 <sup>nd</sup> year – spring	None		
MNT 240 Industrial Equip Troubleshooting	2	2 <sup>nd</sup> year – spring	Pre: ELC 112 or ELC 131 Co: ELC 112		

**Electives: (All degree seeking students must take one Humanities/Fine Arts and one Social/Behavioral Sciences elective from lists below unless a specific course is required above.)**

<b>Humanities/Fine Arts Electives (3 credits)**</b> Courses with the following prefixes will satisfy this requirement: ART, DRA, ENG (literature courses only), HUM, MUS, PHI, REL, and SPA (Intermediate Spanish I only).			
Courses offered at RCC: ART 111, DRA 111, ENG 131, ENG 231, ENG 232, MUS 110, PHI 240, REL 211, REL 212, SPA 211			
<b>Course</b>	<b>Recommended Semester</b>	<b>Semester Registered/Planned</b>	<b>Semester Completed/Grade</b>
	1st year – summer		

<b>Social/Behavioral Sciences Electives (3 credits)**</b> (Courses with the following prefixes will satisfy this requirement: ANT, ECO+, GEO, HIS, POL, PSY, and SOC) +Some business and accounting curricula require economics and do not accept ECO courses as fulfillment of this elective requirement.)			
Courses offered at RCC: ANT 220, HIS 111, HIS 112, HIS 131, HIS 132, PSY 150, PSY 241, SOC 210, SOC 213			
<b>Course</b>	<b>Recommended Semester</b>	<b>Semester Registered/Planned</b>	<b>Semester Completed/Grade</b>
	1st year – summer		

**NOTES:** \*All courses must be completed with a grade of "C" or better.

\*\*See course catalog for prerequisite and/or corequisite requirements.

**Students please read the following and sign below.**

I understand that as an RCC student, I am ultimately responsible for my schedule. I understand that I must complete each course with a grade of "C" or better and follow the established course sequence or my ability to graduate on time may be affected.

My advisor has information regarding other colleges and transfer opportunities that I can investigate after completing my degree/diploma/certificate, and I understand that if I would like more information I can schedule an appointment with him/her.

Student Name: \_\_\_\_\_ Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Advisor Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Student Name: \_\_\_\_\_ Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Advisor Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Student Name: \_\_\_\_\_ Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Advisor Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Student Name: \_\_\_\_\_ Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Advisor Name: \_\_\_\_\_ Advisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_