

# APETCH: ENGINEERING TECHNOLOGY

---

## Completed Workflow

1. AMTD Chair (acoleman10@wccnet.edu)
2. AT Dean (krue@wccnet.edu,esamulski@wccnet.edu)
3. C&A Assistant (aabooker@wccnet.edu)
4. Curricular Systems Coordinator (cacevans@wccnet.edu)
5. C&A Coordinator (sabird@wccnet.edu)
6. C&A Director (bjlinford@wccnet.edu)
7. Before Comm review (aabooker@wccnet.edu)
8. Before Comm review (aabooker@wccnet.edu)
9. Comm Review step (sabird@wccnet.edu)
10. After Comm review (sabird@wccnet.edu,bjlinford@wccnet.edu)
11. Curriculum Committee Chair (rvanwagnen@wccnet.edu)
12. Assessment Committee Chair (jhale15@wccnet.edu)
13. Before VPI (sabird@wccnet.edu)
14. Vice President for Instruction (hbhirth@wccnet.edu; brtucker@wccnet.edu)
15. Curricular Systems Coordinator (cacevans@wccnet.edu)

## Approval Path

1. 2026-02-02T17:46:37Z  
Allan Coleman (acoleman10): Approved for AMTD Chair
2. 2026-02-02T17:55:58Z  
Eva Samulski (esamulski): Approved for AT Dean
3. 2026-03-05T20:36:42Z  
Ben Linford (bjlinford): Approved for C&A Assistant
4. 2026-03-05T20:38:31Z  
Carol Evans (cacevans): Approved for Curricular Systems Coordinator
5. 2026-03-05T20:55:01Z  
Ben Linford (bjlinford): Approved for C&A Coordinator
6. 2026-03-05T20:57:05Z  
Ben Linford (bjlinford): Approved for C&A Director
7. 2026-03-06T20:13:04Z  
Ben Linford (bjlinford): Approved for Before Comm review
8. 2026-03-06T20:13:27Z  
Ben Linford (bjlinford): Approved for Before Comm review
9. 2026-03-13T20:32:57Z  
Ben Linford (bjlinford): Approved for Comm Review step
10. 2026-03-17T14:08:13Z  
Ben Linford (bjlinford): Approved for After Comm review
11. 2026-03-19T17:29:38Z  
Randy Van Wagnen (rvanwagnen): Approved for Curriculum Committee Chair
12. 2026-03-26T14:51:12Z  
Jessica Hale (jhale15): Approved for Assessment Committee Chair
13. 2026-03-27T17:12:55Z  
Sera Bird (sabird): Approved for Before VPI
14. 2026-03-30T12:50:35Z  
Brandon Tucker (brtucker): Approved for Vice President for Instruction
15. 2026-03-30T13:11:30Z  
Carol Evans (cacevans): Approved for Curricular Systems Coordinator

## History

1. Jan 7, 2026 by Carol Evans (cacevans)
2. Mar 30, 2026 by Allan Coleman (acoleman10)

## Viewing: APETCH : Engineering Technology

Changes proposed by: Allan Coleman (acoleman10)

## Program Cover

**Program Name**

Engineering Technology

**Transcript Title**

Engineering Technology

**Department**

Advanced Manufacturing

**Division/College**

Adv Tech/Public Serv Careers

**Academic Level**

Credit

**Program Code**

APETCH

**Type of Award**

Associate of Applied Science

**Does this program lead to licensure?**

No

**Is this intended to be an embedded program?**

No

**Is this program occupational?**

Yes

**Is it state approved?**

No

**Program Occupation**

High Skill Occupation

High Wage Occupation

**CIP Code**

15000 - 15000

## Purpose

**Rationale**

Adding ENG 111X as option

**Effective Catalog**

Fall 2026

**Proposed Effective Term**

Other

**Program Curriculum**

Select one of the following concentrations:

- Industrial Electronics (INEL)
- Semiconductor and Battery Manufacturing (SBM)

## Full-Time Students

### Industrial Electronics (INEL)

Minimum Credits Required for the Concentration: 60

<b>First Semester</b>		<b>Credits</b>
ELE 111	Electrical Fundamentals	4
MEC 101	Blueprint Reading for Manufacturing	2
MTH 176	College Algebra	4
or higher numbered 4cr math course ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#math">https://coursecatalog.wccnet.edu/academics/general-education/#math</a> )		
NCT 120	Introduction to Computer Aided Design (CAD) for Manufacturing.	2
<b>Credits</b>		<b>12</b>
<b>Second Semester</b>		
CEM 101	Introductory Chemistry	4
or higher numbered 4cr chemistry course ( <a href="https://coursecatalog.wccnet.edu/course-descriptions/cem/">https://coursecatalog.wccnet.edu/course-descriptions/cem/</a> )		
CNT 206	Introduction to Networks	4
ELE 211	Basic Electronics	4
Speech/Comp. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#writing">https://coursecatalog.wccnet.edu/academics/general-education/#writing</a> )		3
<b>Credits</b>		<b>15</b>
<b>Third Semester</b>		
ELE 134	Motors and Controls	4
ENG 111 or ENG 111X	Composition I or Composition 1	4
<b>Credits</b>		<b>8</b>
<b>Fourth Semester</b>		
ELE 121	Soldering for Electronics	2
ELE 224	Programmable Controllers (PLCs) I	4
CST 140	Digital Logic and Computer Design	3
Soc. Sci. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci">https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci</a> )		3
<b>Credits</b>		<b>12</b>
<b>Fifth Semester</b>		
ELE 254	Programmable Controllers (PLCs) II	4
MEC 105	Pneumatics and Hydraulics in Fluid Power	4
MEC 201	Mechanisms and Introduction to Mechatronics	2
Arts/Humanities Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#arthuma">https://coursecatalog.wccnet.edu/academics/general-education/#arthuma</a> )		3
<b>Credits</b>		<b>13</b>
<b>Total Credits</b>		<b>60</b>

## Semiconductor and Battery Manufacturing (SBM)

Minimum Credits Required for the Concentration or Option: 60

<b>First Semester</b>		<b>Credits</b>
ELE 111	Electrical Fundamentals	4
MEC 101	Blueprint Reading for Manufacturing	2
MTH 176	College Algebra	4
or higher numbered 4cr math course ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#math">https://coursecatalog.wccnet.edu/academics/general-education/#math</a> )		
ROB 101	Robotics I - I	2
ROB 110	Robotics I - II	2
<b>Credits</b>		<b>14</b>
<b>Second Semester</b>		
CEM 101	Introductory Chemistry	4
or higher numbered 4cr chemistry course ( <a href="https://coursecatalog.wccnet.edu/course-descriptions/cem/">https://coursecatalog.wccnet.edu/course-descriptions/cem/</a> )		
ENG 111 or ENG 111X	Composition I or Composition 1	4
ELE 211	Basic Electronics	4
ROB 212	Robotics II	4
<b>Credits</b>		<b>16</b>
<b>Third Semester</b>		
ELE 121	Soldering for Electronics	2
ELE 224	Programmable Controllers (PLCs) I	4
MEC 105	Pneumatics and Hydraulics in Fluid Power	4
Soc. Sci. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci">https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci</a> )		3
Restricted Elective(s)		2-3

CST 140	Digital Logic and Computer Design	
MEC 100	Materials and Processes	
MEC 201	Mechanisms and Introduction to Mechatronics	
NCT 120	Introduction to Computer Aided Design (CAD) for Manufacturing.	
<b>Credits</b>		<b>15</b>
<b>Fourth Semester</b>		
ELE 206	Semiconductor Manufacturing	2
ELE 208	Battery Manufacturing	2
ELE 254	Programmable Controllers (PLCs) II	4
Arts/Humanities Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#arthuma">https://coursecatalog.wccnet.edu/academics/general-education/#arthuma</a> )		3
Speech/Comp. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#writing">https://coursecatalog.wccnet.edu/academics/general-education/#writing</a> )		3
Open Elective(s) to reach a minimum of 60 total credits.		1
<b>Credits</b>		<b>15</b>
<b>Total Credits</b>		<b>60</b>

## Part-Time Students

### Industrial Electronics (INEL)

Minimum Credits Required for the Concentration or Option: 60

<b>First Semester</b>		<b>Credits</b>
ELE 111	Electrical Fundamentals	4
MTH 176	College Algebra	4
or higher numbered 4cr math course ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#math">https://coursecatalog.wccnet.edu/academics/general-education/#math</a> )		
<b>Credits</b>		<b>8</b>
<b>Second Semester</b>		
ELE 211	Basic Electronics	4
MEC 101	Blueprint Reading for Manufacturing	2
NCT 120	Introduction to Computer Aided Design (CAD) for Manufacturing.	2
<b>Credits</b>		<b>8</b>
<b>Third Semester</b>		
CEM 101	Introductory Chemistry	4
or higher numbered 4cr chemistry course ( <a href="https://coursecatalog.wccnet.edu/course-descriptions/cem/">https://coursecatalog.wccnet.edu/course-descriptions/cem/</a> )		
ENG 111	Composition I	4
or ENG 111X		
<b>Credits</b>		<b>8</b>
<b>Fourth Semester</b>		
CST 140	Digital Logic and Computer Design	3
ELE 121	Soldering for Electronics	2
ELE 224	Programmable Controllers (PLCs) I	4
<b>Credits</b>		<b>9</b>
<b>Fifth Semester</b>		
ELE 254	Programmable Controllers (PLCs) II	4
MEC 201	Mechanisms and Introduction to Mechatronics	2
<b>Credits</b>		<b>6</b>
<b>Sixth Semester</b>		
ELE 134	Motors and Controls	4
Arts/Humanities Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#arthuma">https://coursecatalog.wccnet.edu/academics/general-education/#arthuma</a> )		3
<b>Credits</b>		<b>7</b>
<b>Seventh Semester</b>		
Soc. Sci. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci">https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci</a> )		3
MEC 105	Pneumatics and Hydraulics in Fluid Power	4
<b>Credits</b>		<b>7</b>
<b>Eighth Semester</b>		
CNT 206	Introduction to Networks	4
Speech/Comp. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#writing">https://coursecatalog.wccnet.edu/academics/general-education/#writing</a> )		3
<b>Credits</b>		<b>7</b>
<b>Total Credits</b>		<b>60</b>

## Semiconductor and Battery Manufacturing (SBM)

Minimum Credits Required for the Concentration or Option: 60

First Semester		Credits
ELE 111	Electrical Fundamentals	4
MTH 176	College Algebra	4
or higher numbered 4cr math course ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#math">https://coursecatalog.wccnet.edu/academics/general-education/#math</a> )		
<b>Credits</b>		<b>8</b>
Second Semester		
ROB 101	Robotics I - I	2
ROB 110	Robotics I - II	2
MEC 101	Blueprint Reading for Manufacturing	2
<b>Credits</b>		<b>6</b>
Third Semester		
ROB 212	Robotics II	4
ENG 111 or ENG 111X	Composition I or Composition 1	4
<b>Credits</b>		<b>8</b>
Fourth Semester		
CEM 101	Introductory Chemistry	4
or higher numbered 4cr chemistry course ( <a href="https://coursecatalog.wccnet.edu/course-descriptions/cem/">https://coursecatalog.wccnet.edu/course-descriptions/cem/</a> )		
ELE 224	Programmable Controllers (PLCs) I	4
<b>Credits</b>		<b>8</b>
Fifth Semester		
ELE 254	Programmable Controllers (PLCs) II	4
Speech/Comp. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#writing">https://coursecatalog.wccnet.edu/academics/general-education/#writing</a> )		3
<b>Credits</b>		<b>7</b>
Sixth Semester		
Arts/Humanities Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#arthuma">https://coursecatalog.wccnet.edu/academics/general-education/#arthuma</a> )		3
Soc. Sci. Elective(s) ( <a href="https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci">https://coursecatalog.wccnet.edu/academics/general-education/#socbehavsci</a> )		3
ELE 121	Soldering for Electronics	2
<b>Credits</b>		<b>8</b>
Seventh Semester		
ELE 206	Semiconductor Manufacturing	2
ELE 211	Basic Electronics	4
Restricted Elective(s)		2-3
CST 140	Digital Logic and Computer Design	
MEC 100	Materials and Processes	
MEC 201	Mechanisms and Introduction to Mechatronics	
NCT 120	Introduction to Computer Aided Design (CAD) for Manufacturing.	
<b>Credits</b>		<b>8</b>
Eighth Semester		
ELE 208	Battery Manufacturing	2
MEC 105	Pneumatics and Hydraulics in Fluid Power	4
Open Elective(s) to reach a minimum of 60 total credits.		1
<b>Credits</b>		<b>7</b>
<b>Total Credits</b>		<b>60</b>

### Program Description for Catalog

This program is designed to provide students with the opportunity to develop hands-on skills for careers in high-demand fields like semiconductor and battery manufacturing, industrial electronics, and robotics technology. As the demand for skilled semiconductor and nanotechnology professionals continues to rise in our increasingly connected world, this program aims to strengthen the local workforce, equipping it with the expertise needed to compete on a global scale in this critical industry.

In the Industrial Electronics Concentration, students will develop skills in mechatronics and industrial automation, and will earn the additional Industrial Electronics Technology certificate (<https://coursecatalog.wccnet.edu/programs/industrial-electronics-technology-certificate/>) upon completing the program. In the Semiconductor and Battery Manufacturing Concentration, students will develop skills in robotics and electronics manufacturing, and will earn the additional Semiconductor and Battery Manufacturing certificate (<https://coursecatalog.wccnet.edu/programs/semiconductor-and-battery-manufacturing-advanced-certificate/#curriculumtext>) and

Robotics Technician (<https://coursecatalog.wccnet.edu/programs/robotics-technician-certificate/>) certificates upon completing the program.

**Program Description for Marketing**

n/a

**Admission/Eligibility Requirements**

**Additional program information (articulation, accreditation, advisors)**

**Program Assessment Plan**

**Learning Outcome**

**Learning Outcome**

Identify the major concepts of the semi-conductor manufacturing industry. (SBM Concentration)

**Assessment #1**

**Assessment Tool**

Outcome-related exam questions

**Anticipated assessment population**

All students from all sections

**Standard of success to be used for this assessment**

70% of students will score 70% or higher.

**Who will score and analyze the data?**

Departmental faculty

**Scoring/evaluation tool (attach if possible)**

Answer key

**Assessment #2**

**Learning Outcome**

**Learning Outcome**

Explain how batteries function, including electrochemistry, materials, and design considerations. (SBM Concentration)

**Assessment #1**

**Assessment Tool**

Outcome-related exam questions

**Anticipated assessment population**

All students from all sections

**Standard of success to be used for this assessment**

70% of students will score 70% or higher.

**Who will score and analyze the data?**

Departmental faculty

**Scoring/evaluation tool (attach if possible)**

Answer key

**Assessment #2**

## Learning Outcome

### Learning Outcome

Install and troubleshoot PLC analog I/O (Programmable Logic Controller analog input/output). (SBM Concentration)

### Assessment #1

#### Assessment Tool

Outcome-related exam questions and lab quizzes

#### Anticipated assessment population

All students from all sections

#### Standard of success to be used for this assessment

70% of students will score 70% or higher.

#### Who will score and analyze the data?

Departmental faculty

#### Scoring/evaluation tool (attach if possible)

Answer key and rubric

### Assessment #2

## Learning Outcome

### Learning Outcome

Create acceptable through-hole and surface mount solder joints. (INEL Concentration)

### Assessment #1

#### Assessment Tool

Outcome-related demonstration

#### Anticipated assessment population

All students from all sections

#### Standard of success to be used for this assessment

70% of students will score 70% or higher.

#### Who will score and analyze the data?

Departmental faculty

#### Scoring/evaluation tool (attach if possible)

Checklist

### Assessment #2

## Learning Outcome

### Learning Outcome

Develop, interpret, and troubleshoot programmable logic controller (PLC) programs with relay-type, timer, counter, data manipulation, math and program control instructions using PLC programming and monitoring software. (INEL Concentration)

### Assessment #1

#### Assessment Tool

Outcome-related lab project

**Anticipated assessment population**

All students from all sections

**Standard of success to be used for this assessment**

70% of students will score 70% or higher.

**Who will score and analyze the data?**

Departmental faculty

**Scoring/evaluation tool (attach if possible)**

Rubric

**Assessment #2**

---

**Learning Outcome**

**Learning Outcome**

Experiment with diodes to observe response to changes in temperature and current flow conditions and analyze the diode voltage drops change for semiconductors placed in circuits. (INEL Concentration)

**Assessment #1**

**Assessment Tool**

Outcome-related lab project

**Anticipated assessment population**

All students from all sections

**Standard of success to be used for this assessment**

70% of students will score 70% or higher.

**Who will score and analyze the data?**

Departmental faculty

**Scoring/evaluation tool (attach if possible)**

Rubric

**Assessment #2**

---

**Budget**

**Anticipated budget: Faculty (include estimated amounts if possible)**

N/A

**Anticipated budget: Training/Travel (include estimated amounts if possible)**

N/A

**Anticipated budget: Materials/Resources (include estimated amounts if possible)**

N/A

**Anticipated budget: Facilities/Equipment (include estimated amounts if possible)**

N/A

**Additional Information**

**Is this a substantive change?**

Yes

**Do you anticipate this change will have an impact on the staffing, equipment, or space needs for this program?**

No

**Please confirm that any departments potentially impacted by the program changes have been consulted - for example, consider the Advising team, Marketing, other Academic programs that may partially overlap with this program, Scheduling, Registrar, Articulation, etc. If you need help determining which departments should be consulted, please contact the C&A office.**

Yes

**Reviewer Comments**

**Ben Linford (bjlinford) (2026-03-05T20:36:37Z):** Pulled forward to Carol 3/5/26 to expedite review

**Ben Linford (bjlinford) (2026-03-05T20:54:57Z):** Pulled forward to CAD 3/5/26 to expedite review

Key: 148

# Engineering Technology (AAS)

---

**Catalog Effective Term:** Fall 2025

**Program Code:** APETCH

**Credential:** Associate in Applied Science

*High Demand Occupation, High Skill Occupation, High Wage Occupation*

This program is designed to provide students with the opportunity to develop hands-on skills for careers in high-demand fields like semiconductor and battery manufacturing, industrial electronics, and robotics technology. As the demand for skilled semiconductor and nanotechnology professionals continues to rise in our increasingly connected world, this program aims to strengthen the local workforce, equipping it with the expertise needed to compete on a global scale in this critical industry.

In the Industrial Electronics Concentration, students will develop skills in mechatronics and industrial automation, and will earn the additional Industrial Electronics Technology certificate upon completing the program. In the Semiconductor and Battery Manufacturing Concentration, students will develop skills in robotics and electronics manufacturing, and will earn the additional Semiconductor and Battery Manufacturing and Robotics Technician certificates upon completing the program.

Select one of the following concentrations:

- Industrial Electronics (INEL)
- Semiconductor and Battery Manufacturing (SBM)

---

## **+** Full-Time Students

## + Industrial Electronics (INEL)

Minimum Credits Required for the Concentration: 60

First Semester		Credits
<a href="#">ELE 111</a>	Electrical Fundamentals	4
<a href="#">MEC 101</a>	Blueprint Reading for Manufacturing	2
<a href="#">MTH 176</a>	College Algebra	4
<a href="#">or higher numbered 4cr math course</a>		
<a href="#">NCT 120</a>	Introduction to 2D CAD CAM Programming and Applications	2
<b>Credits</b>		<b>12</b>
Second Semester		
<a href="#">CEM 101</a>	Introductory Chemistry	4
<a href="#">or higher numbered 4cr chemistry course</a>		
<a href="#">CNT 206</a>	Introduction to Networks	4
<a href="#">ELE 211</a>	Basic Electronics	4
<a href="#">Speech/Comp. Elective(s)</a>		3
<b>Credits</b>		<b>15</b>
Third Semester		
<a href="#">ELE 134</a>	Motors and Controls	4
<a href="#">ENG 111</a>	Composition I	4

<b>Credits</b>	<b>8</b>
<b>Fourth Semester</b>	
<a href="#">ELE 121</a> Hand Soldering Techniques	2
<a href="#">ELE 224</a> Programmable Controllers (PLCs) I	4
<a href="#">CST 140</a> Digital Logic and Computer Design	3
<a href="#">Soc. Sci. Elective(s)</a>	3
<b>Credits</b>	<b>12</b>
<b>Fifth Semester</b>	
<a href="#">ELE 254</a> Programmable Controllers (PLCs) II	4
<a href="#">MEC 105</a> Pneumatics and Hydraulics in Fluid Power	4
<a href="#">MEC 201</a> Mechanisms and Introduction to Mechatronics	2
<a href="#">Arts/Human. Elective(s)</a>	3
<b>Credits</b>	<b>13</b>
<b>Total Credits</b>	<b>60</b>

## ⊕ Semiconductor and Battery Manufacturing (SBM)

Minimum Credits Required for the Concentration or Option: 60

First Semester	Credits
<a href="#">ELE 111</a> Electrical Fundamentals	4
<a href="#">MEC 101</a> Blueprint Reading for Manufacturing	2
<a href="#">MTH 176</a> College Algebra	4

---

or higher numbered 4cr math course

---

<u>ROB 101</u>	Robotics I - I	2
----------------	----------------	---

---

<u>ROB 110</u>	Robotics I - II	2
----------------	-----------------	---

---

<b>Credits</b>		<b>14</b>
----------------	--	-----------

---

### Second Semester

---

<u>CEM 101</u>	Introductory Chemistry	4
----------------	------------------------	---

---

or higher numbered 4cr chemistry course

---

<u>ENG 111</u>	Composition I	4
----------------	---------------	---

---

<u>ELE 211</u>	Basic Electronics	4
----------------	-------------------	---

---

<u>ROB 212</u>	Robotics II	4
----------------	-------------	---

---

<b>Credits</b>		<b>16</b>
----------------	--	-----------

---

### Third Semester

---

<u>ELE 121</u>	Hand Soldering Techniques	2
----------------	---------------------------	---

---

<u>ELE 224</u>	Programmable Controllers (PLCs) I	4
----------------	-----------------------------------	---

---

<u>MEC 105</u>	Pneumatics and Hydraulics in Fluid Power	4
----------------	--	---

---

<u>Soc. Sci. Elective(s)</u>		3
------------------------------	--	---

---

Restricted Elective(s)		2-3
------------------------	--	-----

---

<u>CST 140</u>	Digital Logic and Computer Design	
----------------	-----------------------------------	--

---

<u>MEC 100</u>	Materials and Processes	
----------------	-------------------------	--

---

<u>MEC 201</u>	Mechanisms and Introduction to Mechatronics	
----------------	---	--

---

<a href="#">NCT 120</a>	Introduction to 2D CAD CAM Programming and Applications	
	<b>Credits</b>	<b>15</b>
<b>Fourth Semester</b>		
<a href="#">ELE 206</a>	Semiconductor Manufacturing	2
<a href="#">ELE 208</a>	Battery Manufacturing	2
<a href="#">ELE 254</a>	Programmable Controllers (PLCs) II	4
	<a href="#">Arts/Human. Elective(s)</a>	3
	<a href="#">Speech/Comp. Elective(s)</a>	3
	Open Elective(s) to reach a minimum of 60 total credits.	1
	<b>Credits</b>	<b>15</b>
	<b>Total Credits</b>	<b>60</b>

## + Part-Time Students

### + Industrial Electronics (INEL)

Minimum Credits Required for the Concentration or Option: 60

First Semester		Credits
<a href="#">ELE 111</a>	Electrical Fundamentals	4
<a href="#">MTH 176</a>	College Algebra	4

---

or higher numbered 4cr math course

---

**Credits** **8**

---

**Second Semester**

ELE 211 Basic Electronics 4

---

MEC 101 Blueprint Reading for Manufacturing 2

---

NCT 120 Introduction to 2D CAD CAM Programming and Applications 2

---

**Credits** **8**

---

**Third Semester**

CEM 101 Introductory Chemistry 4

---

or higher numbered 4cr chemistry course

---

ENG 111 Composition I 4

---

**Credits** **8**

---

**Fourth Semester**

CST 140 Digital Logic and Computer Design 3

---

ELE 121 Hand Soldering Techniques 2

---

ELE 224 Programmable Controllers (PLCs) I 4

---

**Credits** **9**

---

**Fifth Semester**

ELE 254 Programmable Controllers (PLCs) II 4

---

MEC 201 Mechanisms and Introduction to Mechatronics 2

---

<b>Credits</b>	<b>6</b>
<b>Sixth Semester</b>	
<a href="#">ELE 134</a> Motors and Controls	4
<a href="#">Arts/Human. Elective(s)</a>	3
<b>Credits</b>	<b>7</b>
<b>Seventh Semester</b>	
<a href="#">Soc. Sci. Elective(s)</a>	3
<a href="#">MEC 105</a> Pneumatics and Hydraulics in Fluid Power	4
<b>Credits</b>	<b>7</b>
<b>Eighth Semester</b>	
<a href="#">CNT 206</a> Introduction to Networks	4
<a href="#">Speech/Comp. Elective(s)</a>	3
<b>Credits</b>	<b>7</b>
<b>Total Credits</b>	<b>60</b>

## ⊕ Semiconductor and Battery Manufacturing (SBM)

Minimum Credits Required for the Concentration or Option: 60

First Semester	Credits
<a href="#">ELE 111</a> Electrical Fundamentals	4
<a href="#">MTH 176</a> College Algebra	4
<a href="#">or higher numbered 4cr math course</a>	

	<b>Credits</b>	<b>8</b>
<b>Second Semester</b>		
<a href="#"><u>ROB 101</u></a>	Robotics I - I	2
<a href="#"><u>ROB 110</u></a>	Robotics I - II	2
<a href="#"><u>MEC 101</u></a>	Blueprint Reading for Manufacturing	2
	<b>Credits</b>	<b>6</b>
<b>Third Semester</b>		
<a href="#"><u>ROB 212</u></a>	Robotics II	4
<a href="#"><u>ENG 111</u></a>	Composition I	4
	<b>Credits</b>	<b>8</b>
<b>Fourth Semester</b>		
<a href="#"><u>CEM 101</u></a>	Introductory Chemistry	4
	<a href="#"><u>or higher numbered 4cr chemistry course</u></a>	
<a href="#"><u>ELE 224</u></a>	Programmable Controllers (PLCs) I	4
	<b>Credits</b>	<b>8</b>
<b>Fifth Semester</b>		
<a href="#"><u>ELE 254</u></a>	Programmable Controllers (PLCs) II	4
	<a href="#"><u>Speech/Comp. Elective(s)</u></a>	3
	<b>Credits</b>	<b>7</b>
<b>Sixth Semester</b>		
	<a href="#"><u>Arts/Human. Elective(s)</u></a>	3

<u>Soc. Sci. Elective(s)</u>		3
<u>ELE 121</u>	Hand Soldering Techniques	2
	<b>Credits</b>	<b>8</b>
<b>Seventh Semester</b>		
<u>ELE 206</u>	Semiconductor Manufacturing	2
<u>ELE 211</u>	Basic Electronics	4
Restricted Elective(s)		2-3
<u>CST 140</u>	Digital Logic and Computer Design	
<u>MEC 100</u>	Materials and Processes	
<u>MEC 201</u>	Mechanisms and Introduction to Mechatronics	
<u>NCT 120</u>	Introduction to 2D CAD CAM Programming and Applications	
	<b>Credits</b>	<b>8</b>
<b>Eighth Semester</b>		
<u>ELE 208</u>	Battery Manufacturing	2
<u>MEC 105</u>	Pneumatics and Hydraulics in Fluid Power	4
Open Elective(s) to reach a minimum of 60 total credits.		1
	<b>Credits</b>	<b>7</b>
	<b>Total Credits</b>	<b>60</b>

**PROGRAM PROPOSAL FORM**

- Preliminary Approval** – Check here when using this form for preliminary approval of a program proposal, and respond to the items in general terms.
- Final Approval** – Check here when completing this form after the Vice President for Instruction has given preliminary approval to a program proposal. For final approval, complete information must be provided for each item.

<p><b>Program Name:</b></p> <p><b>Division and Department:</b></p> <p><b>Type of Award:</b></p> <p><b>Effective Year (new programs are always effective in the Fall term):</b></p> <p><b>Initiator:</b></p>	<p><u>Engineering Technology</u>  <u>Concentration in Semiconductor and Battery Manufacturing</u>  <u>Concentration in Industrial Electronics Technology</u></p> <p><u>Advanced Manufacturing</u></p> <p><input type="checkbox"/> AA   <input type="checkbox"/> AS   <input checked="" type="checkbox"/> <b>AAS</b>  <input type="checkbox"/> Cert.   <input type="checkbox"/> Adv. Cert.   <input type="checkbox"/> Post-Assoc. Cert.   <input type="checkbox"/> Cert. of Comp.</p> <p><u>Fall 2025</u></p> <p><u>Zach Goldenberg</u></p>	<p><b>Program Code:</b></p> <p>_____</p> <p><b>CIP Code:</b></p> <p><u>15.0000</u></p>
<p><b>Program Features</b>                  Program's purpose and its goals.                  Criteria for entry into the program, along with projected enrollment figures.                  Connection to other WCC programs, as well as accrediting agencies or professional organizations.                  Special features of the program.</p>	<p><b>Program Purpose and Goals</b>                  The Engineering Technology program at WCC is designed to provide students with the technical expertise and hands-on skills needed for immediate employment in high-demand fields, such as semiconductor and battery manufacturing, and industrial electronics. With a curriculum that emphasizes applied engineering principles and real-world problem-solving, students gain the capabilities to design, innovate, and refine products and processes in alignment with current industry standards and technological advancements.</p> <p><b>Program Connections and Accreditation</b>                  WCC's Engineering Technology program integrates seamlessly with other complementary areas of study, including:</p> <ul style="list-style-type: none"> <li><b>Advanced Manufacturing:</b> Through coursework in mechatronics, robotics, CNC machining, and more, this department equips students with comprehensive knowledge of key manufacturing processes.</li> <li><b>Bachelor's Degree Pathways:</b> The program offers transfer options for students who wish to pursue bachelor's degrees in related fields at one of WCC's partner institutions, ensuring a smooth transition to further education.</li> </ul> <p><b>Special Features</b>                  The Engineering Technology program at WCC stands out with several distinctive features:</p> <ul style="list-style-type: none"> <li><b>State-of-the-Art Facilities:</b> Access to advanced laboratories equipped with industry-standard tools and technology allows students to engage in immersive, hands-on learning.</li> <li><b>Experienced Faculty:</b> With extensive industry experience, faculty members provide mentorship and insights that bridge classroom learning with real-world practices.</li> </ul>	

	<ul style="list-style-type: none"> <li>• <b>Industry Partnerships:</b> Collaborations with local and national businesses offer students valuable opportunities for internships, cooperative learning experiences, and potential employment.</li> <li>• <b>Flexible Scheduling:</b> Day and evening classes support both full-time and part-time students, making the program accessible to a wide range of learners.</li> </ul> <p>The program also includes embedded certificate options within the concentration they choose, enabling students to build momentum in their educational journey while earning additional credentials:</p> <ul style="list-style-type: none"> <li>• <b>Industrial Electronics Technology Certificate (CFIET)</b></li> <li>• <b>Robotics Technician Certificate (CTROBT)</b></li> <li>• <b>Semiconductor and Battery Manufacturing Advanced Certificate (new certificate proposed in tandem with this program, currently seeking approval)</b></li> </ul> <p>Collectively, these program elements prepare graduates to excel and make meaningful contributions in their chosen fields, ensuring they are workforce-ready and adaptable to evolving industry demands.</p>
<p><b>Need</b></p> <p>Need for the program with evidence to support the stated need.</p>	<p>The Engineering Technology program at WCC meets a critical need for skilled technicians in high-growth industries such as semiconductor and battery manufacturing, and industrial electronics. With rising demand for expertise in electric vehicles, renewable energy, and advanced electronics, this program equips students with practical skills that are essential in local and national markets, offering competitive wages and stable career paths.</p> <p>Southeast Michigan is considered a “hotspot” for careers in this field. Technician positions in <a href="#">semiconductor processing</a>, <a href="#">electronic</a> or <a href="#">nanotechnology</a> engineering have been on the rise, and the rise is expected to continue. <a href="#">Electro-mechanical</a>, <a href="#">commercial electronics repair</a>, <a href="#">control &amp; valve installers</a> and <a href="#">robotics technician</a> careers are also plentiful, especially in Wayne and Oakland counties. Entry-level positions in these fields average between \$60 and \$70k annually. Through hands-on learning and specialized certificates, graduates will be prepared to support innovation and sustainability, and become better qualified to fill these essential roles in industries vital to future technology and economic development.</p>
<p><b>Curriculum</b></p> <p>List the courses in the program as they should appear in the catalog. List minimum credits required. Include any notes that should appear below the course list.</p> <p>Associate degree programs must provide a semester by semester program layout.</p>	<p><b>See attached Excel Spreadsheet</b></p>

Budget Specify program costs in the following areas, per academic year:		START-UP COSTS	ONGOING COSTS
	<b>Faculty</b>	\$ .	\$ .
	<b>Training/Travel</b>	.	.
	<b>Materials/Resources</b>	.	.
	<b>Facilities/Equipment</b>	.	.
	<b>Other</b>	.	.
	<b>TOTALS:</b>	\$ .	\$ .
<b>Program Description for Catalog and Web site</b>	<p>This program is designed to provide students with the opportunity to develop hands-on skills for careers in high-demand fields like semiconductor and battery manufacturing, industrial electronics, and robotics technology. As the demand for skilled semiconductor and nanotechnology professionals continues to rise in our increasingly connected world, this program aims to strengthen the local workforce, equipping it with the expertise needed to compete on a global scale in this critical industry.</p> <p>In the Industrial Electronics Concentration, students will develop skills in mechatronics and industrial automation, and will earn the additional Industrial Electronics Technology certificate upon completing the program. In the Semiconductor and Battery Manufacturing Concentration, students will develop skills in robotics and electronics manufacturing, and will earn the additional Semiconductor &amp; Battery Manufacturing and Robotics Technician certificates upon completing the program.</p>		
<b>Program Information</b>	<p><b>Accreditation/Licensure – None</b>  <b>Advisors – Niki Lee &amp; Jan Militello</b>  <b>Advisory Committee – N/A</b>  <b>Admission requirements – N/A</b>  <b>Articulation agreements – Exploring transfer opportunities with Wayne State, EMU and U of M</b>  <b>Continuing eligibility requirements – N/A</b></p>		

**Assessment plan for Semiconductor and Battery Manufacturing Concentration**

Program outcomes to be assessed	Assessment tool	When assessment will take place	Courses/other populations	Number students to be assessed
1. Identify the major concepts of the semiconductor manufacturing industry.	Outcome-related exam questions	Fall 2027 Every Three Years	ELE 206	All
2. Explain how batteries function, including electrochemistry, materials, and design considerations.	Outcome-related exam questions	Fall 2027 Every Three Years	ELE 208	All

3. Install and troubleshoot PLC analog I/O (Programmable Logic Controller analog input/output).	Outcome-related exam questions and lab quizzes	Fall 2027 Every Three Years	ELE 254	All
---	--	--------------------------------	---------	-----

**Assessment plan for Industrial Electronics Technology Concentration**

<b>Program outcomes to be assessed</b>	<b>Assessment tool</b>	<b>When assessment will take place</b>	<b>Courses/other populations</b>	<b>Number students to be assessed</b>
1. Create acceptable through-hole and surface mount solder joints.	Outcome-related demonstration	Fall 2027 Every Three Years	ELE 121	All
2. Develop, interpret and troubleshoot programmable logic controller (PLC) programs with relay-type, timer, counter, data manipulation, math and program control instructions using PLC programming and monitoring software.	Outcome-related exam questions	Fall 2027 Every Three Years	ELE 224	All
3. Experiment with diodes to observe response to changes in temperature and current flow conditions and analyze the diode voltage drops change for semiconductors placed in circuits.	Outcome-related lab project	Fall 2027 Every Three Years	ELE 211	All

**Scoring and analysis plan:**

1. Indicate how the above assessment(s) will be scored and evaluated (e.g. departmentally-developed rubric, external evaluation, other). Attach the rubric.

Outcome-related demonstration: checklist  
 Outcome-related exam questions: answer key  
 Outcome-related lab project/lab quizzes: rubric

2. Indicate the standard of success to be used for this assessment.

70% of students will score 70% or higher.

3. Indicate who will score and analyze the data.

Departmental faculty will score and analyze the data.

REVIEWER	PRINT NAME	SIGNATURE	DATE
Initiator	Zach Goldenberg	Zach Goldenberg	11/19/2024
Department Chair/Area Director	Al Coleman	Al Coleman	11/19/2024
Dean	Eva Samulski	<i>Eva Samulski</i>	11/20/2024
<b>Please return completed form to the Office of Curriculum and Assessment (SC 257)</b> <b>or by email to curriculum.assessment@wccnet.edu.</b> <b>Once reviewed by the appropriate faculty committees, we will secure the signature of the VPI and President.</b>			
Curriculum Committee Chair	Randy Van Wagnen	<i>R Van Wagnen</i>	1-11-25
Assessment Committee Chair	Jessica Hale	<i>J Hale</i>	2/13/25
Executive Vice President for Instruction <input type="checkbox"/> Approved for Development <input checked="" type="checkbox"/> Final Approval	Dr. Brandon Tucker	<i>B Tucker</i>	2/25/25
President	Dr. Rose B. Bellanca	<i>Rose B Bellanca</i>	3/4/25
Board Approval			4/22/2025

Reviewed by C&A Committee 1/30/25

<b>Semiconductor and Battery Manufacturing Engineering Technology</b>	
<b>Semester 1 Fall</b>	
ELE 111	4
MTH 176 or higher 4 credit math course	4
ROB 101	2
ROB 110	2
MEC 101	2
<b>Semester 2 Winter</b>	
ENG 111	4
ROB 212	4
ELE 211	4
CEM 101 or higher 4 credit chemistry course	4
<b>Semester 3 Fall</b>	
Soc. Sci Elect	3
ELE 224	4
ELE 121	2
Restricted Elective (MEC 100, MEC 201, NCT 120, CST 140)	2
MEC 105	4
<b>Semester 4 Winter</b>	
ELE 254	4
ELE 206	2
ELE 208	2
Art/Hum Elect	3
Speech/Comp Elect	3
Open Elective(s) to reach a minimum of 60 total credits.	1
<b>Total</b>	<b>60</b>

<b>Industrial Electronics Engineering Technology</b>	
<b>Semester 1 Fall</b>	
ELE 111	4
MTH 176 or higher 4 credit math course	4
NCT 120	2
MEC 101	2
<b>Semester 2 Winter</b>	
ELE 211	4
CEM 101 or higher 4 credit Chemistry course or PHY 111	4
CNT 206	4
Speech/Comp Elect	3
<b>Semester 3 Summer</b>	
ELE 134	4
ENG 111	4
<b>Semester 4 Fall</b>	
ELE 224	4
ELE 121	2
CST 140	3
Soc. Sci Elect	3
<b>Semester 5 Winter</b>	
ELE 254	4
MEC 201	2
MEC 105	4
Art/Hum Elect	3
<b>Total</b>	<b>60</b>

<b>Semiconductor and Battery Manufacturing Engineering Technology</b>	
<b>Semester 1 Fall</b>	
ELE 111	4
MTH 176 or higher 4 credit math course	4
<b>Semester 2 Winter</b>	
ROB 101	2
ROB 110	2
MEC 101	2
<b>Semester 3 Summer</b>	
ROB 212	4
ENG 111	4
<b>Semester 4 Fall</b>	
ELE 224	4
CEM 101 or higher 4 credit chemistry course	4
<b>Semester 5 Winter</b>	
ELE 254	4
Speech/Comp Elect	3
<b>Semester 6 Summer</b>	
Soc. Sci Elect	3
Art/Hum Elect	3
<b>Semester 7 Fall</b>	
ELE 211	4
ELE 121	2
Restricted Elective (MEC 100, MEC 201, NCT 120, CST 140)	2
<b>Semester 8 Winter</b>	
ELE 206	2
ELE 208	2
MEC 105	4
Open Elective(s) to reach a minimum of 60 total credits.	1
<b>Total</b>	<b>60</b>

<b>Industrial Electronics Engineering Technology</b>	
<b>Semester 1 Fall</b>	
ELE 111	4
MTH 176 or higher 4 credit math course	4
<b>Semester 2 Winter</b>	
ELE 211	4
NCT 120	2
MEC 101	2
<b>Semester 3 Summer</b>	
CEM 101 or higher 4 credit Chemistry course or PHY 111	4
ENG 111	4
<b>Semester 4 Fall</b>	
ELE 224	4
ELE 121	2
CST 140	3
<b>Semester 5 Winter</b>	
ELE 254	4
MEC 201	2
<b>Semester 6 Summer</b>	
ELE 134	4
Art/Hum Elect	3
<b>Semester 7 Fall</b>	
Soc. Sci Elect	3
MEC 105	4
<b>Semester 8 Winter</b>	
CNT 206	4
Speech/Comp Elect	3
<b>Total</b>	<b>60</b>