

# ELE 121: SOLDERING FOR ELECTRONICS

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## 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. C&A Assistant (aabooker@wccnet.edu)
8. Comm Review step (sabird@wccnet.edu)
9. After Comm review (sabird@wccnet.edu,bjlinford@wccnet.edu)
10. Curriculum Committee Chair (rvanwagnen@wccnet.edu)
11. Assessment Committee Chair (jhale15@wccnet.edu)
12. Before VPI (sabird@wccnet.edu)
13. Vice President for Instruction (hbhirth@wccnet.edu; brtucker@wccnet.edu)
14. Banner (cacevans@wccnet.edu)
15. Website (sabird@wccnet.edu)

## Approval Path

1. 2025-10-13T16:17:05Z  
Allan Coleman (acoleman10): Approved for AMTD Chair
2. 2025-10-27T13:00:41Z  
Kyrsten Rue (krue): Approved for AT Dean
3. 2025-11-11T22:58:10Z  
Amber Booker (aabooker): Approved for C&A Assistant
4. 2025-11-12T17:02:03Z  
Carol Evans (cacevans): Approved for Curricular Systems Coordinator
5. 2025-11-26T17:53:46Z  
Sera Bird (sabird): Approved for C&A Coordinator
6. 2025-12-11T21:52:02Z  
Ben Linford (bjlinford): Approved for C&A Director
7. 2025-12-12T17:49:05Z  
Amber Booker (aabooker): Approved for C&A Assistant
8. 2026-02-20T16:00:40Z  
Ben Linford (bjlinford): Approved for Comm Review step
9. 2026-03-17T14:15:18Z  
Ben Linford (bjlinford): Approved for After Comm review
10. 2026-03-19T17:15:40Z  
Randy Van Wagnen (rvanwagnen): Approved for Curriculum Committee Chair
11. 2026-03-19T17:36:36Z  
Jessica Hale (jhale15): Approved for Assessment Committee Chair
12. 2026-03-20T15:26:32Z  
Sera Bird (sabird): Approved for Before VPI
13. 2026-03-20T16:21:46Z  
Brandon Tucker (brtucker): Approved for Vice President for Instruction
14. 2026-03-27T07:03:17Z  
Approved for Banner
15. 2026-03-27T12:58:01Z  
Carol Evans (cacevans): Approved for Website

## History

1. Mar 27, 2026 by Allan Coleman (acoleman10)

### Viewing: ELE 121 : Soldering for Electronics

Changes proposed by: Allan Coleman (acoleman10)

#### Effective Term

Summer 2026

**Rationale and proposal summary**

Course title change to "Soldering for Electronics", and course description revised to reflect the recent name change from "Institute for Printed Circuits (IPC)" to the "Association Connecting Electronics Industries," and updates to the exam designation "IPC J-STD-001 Certified IPC Specialist". These changes ensure the course remains aligned with current industry terminology

**Course Cover**

**Full Course Title**

Soldering for Electronics

**Transcript Title**

Soldering for Electronics

**Subject Code**

ELE - Electricity/Electronics

**Course Number**

121

**Department**

Advanced Manufacturing (AMTD)

**Banner Division**

ATP

**Division/College**

Adv Tech/Public Serv Careers (AT)

**Org Code**

14430

**Course Description**

In this course, students will develop both theoretical knowledge and hands-on skills in electronic soldering. Students will practice soldering to industry-recognized standards on common wire connectors, through-hole (THT), and surface-mount (SMT) printed circuit board components, including fine-pitch and microelectronic devices using a stereo microscope. Instruction covers inspection of solder joints for compliance with industry standards, as well as methods for rework and repair of defective solder joints. Emphasis is placed on proper component preparation, soldering techniques, and post-repair inspection. This course prepares students to sit for the Association Connecting Electronics Industries, IPC-J-STD-001 Certified IPC Specialist (CIS) certification exam. The title of this course was previously Hand Soldering Techniques.

**Planned Delivery Format**

Face to Face

**Has this course been approved for virtual or blended virtual?**

No

**Has this course been approved for online or online blended?**

No

**Grading method**

Standard Letter, Audit, Academic Forgiveness

**CIP Code**

159999 - Engineering/Engineering-Related Technologies/Technicians, Other.

**Occupational Indicator**

Yes

**ACS Code**

130

**Credit hours, contact hours, repeatability****Repeatable for additional credit**

No

**Course credits**

2

**Lecture contact hours**

15

**Lab contact hours**

30

**Total Contact Hours**

45

**Expected Total Contact Hours**

45

**Prerequisites and prerequisite skill levels****College-Level Math**

No Level Required

**College-Level Reading and Writing**

College-level Reading and Writing

**Approved Level I Prerequisite:**

Academic Reading and Writing Levels of 6; ELE 111 minimum grade "C"

**Is concurrent enrollment an option for this prerequisite?**

No

**Course Assessment Plan****Learning Outcome****Outcome**

Describe the basic principles of soldering.

**Assessment #1****Assessment Tool**

Outcome-related multiple-choice and short-answer exam questions

**Anticipated Next Assessment Year**

2027

**Anticipated Next Assessment Term**

Fall

**Assessment Cycle**

Every Three Years

**Anticipated assessment population**

All students from all sections

**How the assessment will be scored**

Answer key and rubric

**Who does the scoring?**

Departmental faculty

**Standard of success**

70% of students will score 70% or higher.

**Assessment #2**

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**Learning Outcome**

**Outcome**

Identify industry-recognized standards for acceptable solder joints.

**Assessment #1**

**Assessment Tool**

Outcome-related exam questions

**Anticipated Next Assessment Year**

2027

**Anticipated Next Assessment Term**

Fall

**Assessment Cycle**

Every Three Years

**Anticipated assessment population**

All students from all sections

**How the assessment will be scored**

Answer key

**Who does the scoring?**

Departmental faculty

**Standard of success**

70% of students will score 70% or higher.

**Assessment #2**

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**Learning Outcome**

**Outcome**

Create acceptable through-hole and surface-mount solder joints.

**Assessment #1**

**Assessment Tool**

Outcome-related demonstration

**Anticipated Next Assessment Year**

2027

**Anticipated Next Assessment Term**

Fall

**Assessment Cycle**

Every Three Years

**Anticipated assessment population**

All students from all sections

**How the assessment will be scored**

Rubric

**Who does the scoring?**

Departmental faculty

**Standard of success**

70% of students will score 70% or higher.

**Assessment #2**

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**Learning Outcome****Outcome**

Assess the quality of solder joints using industry-standard visual inspection techniques.

**Assessment #1****Assessment Tool**

Outcome-related demonstration

**Anticipated Next Assessment Year**

2027

**Anticipated Next Assessment Term**

Fall

**Assessment Cycle**

Every Three Years

**Anticipated assessment population**

All students from all sections

**How the assessment will be scored**

Checklist

**Who does the scoring?**

Departmental faculty

**Standard of success**

70% of students will score 70% or higher.

**Assessment #2**

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**Learning Outcome****Outcome**

Repair faulty solder joints.

**Assessment #1****Assessment Tool**

Outcome-related demonstration

**Anticipated Next Assessment Year**

2027

**Anticipated Next Assessment Term**

Fall

**Assessment Cycle**

Every Three Years

**Anticipated assessment population**

All students from all sections

**How the assessment will be scored**

Rubric

**Who does the scoring?**

Departmental faculty

**Standard of success**

70% of students will score 70% or higher.

**Assessment #2****Course Objectives**

	Objective(s)
1.	Explain how concepts such as heat transfer and melting point affect solder joint quality.
2.	Identify types of solder, their properties, and applications.
3.	Identify types of solder flux, their properties, and applications.
4.	Explain the purpose of soldering tools and equipment.
5.	Describe materials and components used in electronic soldering.
6.	Identify industry-recognized standards and requirements.
7.	Demonstrate preparation of electronic components and printed circuit boards (PCBs) for soldering.
8.	Demonstrate proper techniques for heating, applying solder, and ensuring good solder flow for both through-hole and surface mount technology soldering.
9.	Demonstrate techniques for soldering multi-lead devices like integrated circuits (IC) and connectors.
10.	Demonstrate techniques for soldering heat-sensitive components.
11.	Explain methods used for visual inspection of solder joints.
12.	Demonstrate the use of industry standards and inspection techniques to identify acceptable and unacceptable solder joints.
13.	Demonstrate de-soldering techniques.
14.	Demonstrate repairs of cold and bridged joints.
15.	Demonstrate rework of multi-lead and fine-pitch devices.
16.	Demonstrate post-repair inspection and testing techniques.

**General Education Area(s)****Area 1: Writing**

No

**Area 2: 2nd Writing or Communication/Speech**

No

**Area 3: Mathematics**

No

**Area 4: Natural Science**

No

**Area 5: Social and Behavioral Science**

No

**Area 6: Arts and Humanities**

No

**MTA General Education**

No

**Review**

**Is conditional approval requested?**

No

**Is this course currently conditionally approved, and you are now submitting it for full approval?**

No

Key: 4827

# Washtenaw Community College Comprehensive Report

## ELE 121 Hand Soldering Techniques Effective Term: Fall 2025

### Course Cover

**College:** Advanced Technologies and Public Service Careers  
**Division:** Advanced Technologies and Public Service Careers  
**Department:** Advanced Manufacturing  
**Discipline:** Electricity/Electronics  
**Course Number:** 121  
**Org Number:** 14430  
**Full Course Title:** Hand Soldering Techniques  
**Transcript Title:** Hand Soldering Techniques  
**Is Consultation with other department(s) required:** No  
**Publish in the Following:** College Catalog , Time Schedule , Web Page  
**Reason for Submission:** New Course  
**Change Information:**  
**Rationale:** New course  
**Proposed Start Semester:** Fall 2025

**Course Description:** In this course, students will gain a theoretical understanding of the materials, tools, and techniques used, as well as hands-on training in through-hole and surface-mount soldering. Students will also learn industry recognized standards, inspection techniques, and how to repair faulty solder joints. The use of a stereo microscope for post-repair visual inspection will also be explored. This course prepares students to sit for the Institute of Printed Circuits (IPC) basic CIS certification (Certified IPC Specialist).

### Course Credit Hours

**Variable hours:** No  
**Credits:** 2  
**Lecture Hours: Instructor: 15 Student: 15**  
**Lab: Instructor: 30 Student: 30**  
**Clinical: Instructor: 0 Student: 0**  
  
**Total Contact Hours: Instructor: 45 Student: 45**  
**Repeatable for Credit:** NO  
**Grading Methods:** Letter Grades  
**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

### College-Level Reading and Writing

College-level Reading & Writing

### College-Level Math

No Level Required

### Requisites

**Prerequisite**  
ELE 111 minimum grade "C"

### General Education

## Request Course Transfer

### Proposed For:

## Student Learning Outcomes

1. Describe the basic principles of soldering.

### **Assessment 1**

Assessment Tool: Outcome-related multiple-choice and short answer exam questions

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key and rubric

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

2. Identify industry-recognized standards for acceptable solder joints.

### **Assessment 1**

Assessment Tool: Outcome-related exam questions

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

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

3. Create acceptable through-hole and surface mount solder joints.

### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

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

4. Assess the quality of solder joints using industry standard visual inspection techniques.

### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Checklist

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

5. Repair faulty solder joints.

### **Assessment 1**

Assessment Tool: Outcome-related demonstration

Assessment Date: Fall 2027

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

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

### Course Objectives

1. Explain how concepts such as heat transfer and melting point affect solder joint quality.
2. Identify types of solder, their properties, and applications.
3. Identify types of solder flux, their properties, and applications.
4. Explain the purpose of soldering tools and equipment.
5. Describe materials and components used in electronic soldering.
6. Identify industry recognized standards and requirements.
7. Demonstrate preparation of electronic components and printed circuit boards (PCBs) for soldering.
8. Demonstrate proper techniques for heating, applying solder, and ensuring good solder flow for both through-hole and surface mount technology (SMT) soldering.
9. Demonstrate techniques for soldering multi-lead devices like integrated circuits (IC) and connectors.
10. Demonstrate techniques for soldering heat-sensitive components.
11. Explain methods used for visual inspection of solder joints.
12. Demonstrate the use of industry standards and inspection techniques to identify acceptable and unacceptable solder joints.
13. Demonstrate de-soldering techniques.
14. Demonstrate repairs of cold and bridged joints.
15. Demonstrate rework of multi-lead and fine-pitch devices.
16. Demonstrate post-repair inspection and testing techniques.

### New Resources for Course

#### Course Textbooks/Resources

Textbooks

Manuals

Periodicals

Software

#### Equipment/Facilities

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
<b>Faculty Preparer:</b> <i>Zachary Goldenberg</i>	<i>Faculty Preparer</i>	<i>Oct 28, 2024</i>
<b>Department Chair/Area Director:</b> <i>Allan Coleman</i>	<i>Recommend Approval</i>	<i>Oct 29, 2024</i>
<b>Dean:</b> <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Oct 30, 2024</i>
<b>Curriculum Committee Chair:</b> <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Feb 11, 2025</i>
<b>Assessment Committee Chair:</b> <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Feb 13, 2025</i>
<b>Vice President for Instruction:</b> <i>Brandon Tucker</i>	<i>Approve</i>	<i>Feb 14, 2025</i>