

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