

## ECT113 : Printed Circuit Boards and Soldering Technology

### General Information

Author:	<ul style="list-style-type: none"><li>Christopher Herwerth</li></ul>
Course Code (CB01) :	ECT113
Course Title (CB02) :	Printed Circuit Boards and Soldering Technology
Department:	ECT
Proposal Start:	Spring 2026
TOP Code (CB03) :	(0934.00) Electronics and Electric Technology
CIP Code:	(47.0101) Electrical/Electronics Equipment Installation and Repair Technology/Technician, General.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000575688
Curriculum Committee Approval Date:	11/13/2024
Board of Trustees Approval Date:	04/22/2025
Last Cyclical Review Date:	11/13/2024
Course Description and Course Note:	ECT 113 is a comprehensive course providing functional training in the concepts of high-reliability soldering, solder extraction, and electronics component removal/replacement, including terminal inter-connections using wire-wrap techniques. Students learn rework, repair, and specialized high-technology industrial equipment. This course also encompasses rework, repair, and modification of electronic printed circuit boards. Additionally, automated industrial wave solder processes are studied.
Justification:	Mandatory Revision
Academic Career:	<ul style="list-style-type: none"><li>Credit</li></ul>
Mode of Delivery:	<ul style="list-style-type: none"><li>In-Person</li></ul>
Author:	No value
Course Family:	No value

### Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none"><li>Electronic Technology (Radio, television, computer repair, avionics)</li></ul>
Alternate Discipline:	No value
Alternate Discipline:	No value

## Course Development

### Basic Skill Status (CB08)

Course is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

### Course Special Class Status (CB13)

Course is not a special class.

### Pre-Collegiate Level (CB21)

Not applicable.

### Grading Basis

- Grade with Pass / No-Pass Option

### Course Support Course Status (CB26)

Course is not a support course

## General Education and C-ID

### General Education Status (CB25)

Not Applicable

### Transferability

Not transferable

### Transferability Status

Not transferable

## Units and Hours

### Summary

**Minimum Credit Units (CB07)** 1.5

**Maximum Credit Units (CB06)** 1.5

**Total Course In-Class (Contact) Hours** 45

**Total Course Out-of-Class Hours** 36

**Total Student Learning Hours** 81

### Credit / Non-Credit Options

#### Course Type (CB04)

Credit - Degree Applicable

#### Noncredit Course Category (CB22)

Credit Course.

#### Noncredit Special Characteristics

No Value

#### Course Classification Code (CB11)

Credit Course.

Variable Credit Course

#### Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education

Status (CB10)

### Weekly Student Hours

	In Class	Out of Class
Lecture Hours	1	2
Laboratory Hours	1.5	0
Studio Hours	0	0

### Course Student Hours

<b>Course Duration (Weeks)</b>	18
<b>Hours per unit divisor</b>	0
<b>Course In-Class (Contact) Hours</b>	
Lecture	18

Laboratory	27
Studio	0
<b>Total</b>	<b>45</b>

**Course Out-of-Class Hours**

Lecture	36
Laboratory	0
Studio	0
<b>Total</b>	<b>36</b>

**Time Commitment Notes for Students**

No value

**Units and Hours - Weekly Specialty Hours**

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

**Prerequisites, Corequisites, Recommended Corequisites, and Recommended Preparation**

**Advisory**

ESL141 - Grammar And Writing IV

**Objectives**

- Compose a 400 to 450-word thesis-based essay which: (a) summarizes and cites appropriately a reading passage provided as a prompt, (b) includes a clear thesis statement, (c) uses evidence to support the thesis, (d) shows clear organization into an introduction, body, and conclusion, and (e) uses appropriate rhetorical modes such as comparison/contrast, cause/effect, and persuasion in order to support a thesis.

**Entry Standards**

Entry Standards	Description
No value	No value

## Course Limitations

Cross Listed or Equivalent Course

Description

No value

No value

## Specifications

### Methods of Instruction

Methods of Instruction

Lecture

Methods of Instruction

Laboratory

Methods of Instruction

Discussion

Methods of Instruction

Multimedia

Methods of Instruction

Collaborative Learning

Methods of Instruction

Demonstrations

Methods of Instruction

Presentations

### Out of Class Assignments

- Final project (e.g. research on methods of soldering)

### Methods of Evaluation

### Rationale

Exam/Quiz/Test

Regular quizzes

Exam/Quiz/Test

Examination at the end of each instructional module

Exam/Quiz/Test

Final examination

## Textbook Rationale

No Value

## Textbooks

Author	Title	Publisher	Date	ISBN
SRA Solder (Author), Samuel G Skinner (Editor)	How to Solder Electronics: 15 Rules for Successful Soldering: A Complete Beginners Guide	SRA Soldering Products	2022	979-8825581583

## Other Instructional Materials (i.e. OER, handouts)

No Value

## Learning Outcomes

### Course Objectives

Demonstrate proper high-reliability soldering and de-solder techniques, using the "Pace" TR 5 industrial work station equipment to interconnect and disconnect components in several contact configurations, following proper LAB safety procedures.

Demonstrate wire-wrap techniques, using the industrial wire-wrap gun and related tools and equipment, connecting wires in several directed applications.

Complete printed circuit board rework and repair, using the "Pace" PRC-151 industrial repair station equipment, removing and replacing defective components, and repairing defective board surfaces.

Exhibit critical thinking skills by attaining satisfactory scores on examination procedures covering high reliability soldering, wire-wrap, and printed circuit rework, and repair methods and concepts.

### SLOs

**Use industry standard soldering tools and equipment, connecting wires in several directed applications.**

Expected Outcome Performance: 70.0

ILOs  
Core  
ILOs

Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.

Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

**Manufacture electronic circuits, modulars and devices using PCB and electronic components, connectors and terminals.**

Expected Outcome Performance: 70.0

ILOs Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate  
Core creativity that leads to innovative ideas.  
ILOs

Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

**Implement industry standard electronic component soldering and manufacturing and repair procedures.**

Expected Outcome Performance: 70.0

ILOs Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate  
Core creativity that leads to innovative ideas.  
ILOs

Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

## Additional SLO Information

**Does this proposal include revisions that might improve student attainment of course learning outcomes?**

No

**Is this proposal submitted in response to learning outcomes assessment data?**

No

**If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.**

No Value

**SLO Evidence**

No Value

## Course Content

### Lecture Content

#### Introduction (4 hours)

- Safety
- Solder types
- Common soldering irons
- Solder process

#### Methods and Concept (4 hours)

- Tools
- Basic terminal soldering
- High reliability soldering techniques
- High reliability soldering equipment

#### Soldering Procedures (4 hours)

- Turret terminals
- Cup terminals
- Bifurcated terminals
- Applications process

#### Components Replacement (6 hours)

- Axial lead components
- Radial lead components

- Integrated circuits (ICs)
- De-soldering procedures
- Applications process

**Total Hours: 18**

### Laboratory/Studio Content

#### Wire Wrap (8 hours)

- Introductions
- Tools and equipment
- Identification and preparation of wire
- Wrapping connection methods
- Applications process

#### Printed Circuit Board (PCB) Rework and Repair (19 hours)

- Introductory concepts
- Tools and equipment
- Procedures and Techniques
- Single layer PCBs
- Multi-layers PCBs
- Board connectors
- Test and inspection procedures
- Applications processes

**Total Hours: 27**

### Additional Information

#### Repeatability

Not Repeatable

#### Justification (if repeatable was chosen above)

No Value

#### Is it possible this course will have a material fee?

No Value

#### I have contacted my library liaison (<https://campusguides.glendale.edu/faculty/liaisons>):

No Value

#### What term(s) will this course be offered?

No Value

#### Will any additional resources be needed for this course? (Click all that apply)

No Value

If additional resources are needed, add a brief description and cost in the box provided.

No Value

## Resources

Did you contact your departmental library liaison?

No

If yes, who is your departmental library liaison?

Adina Lerner (Technology & Aviation, Visual & Performing Arts)

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value