



ORIGINAL COURSE IMPLEMENTATION DATE: September 2020
 REVISED COURSE IMPLEMENTATION DATE:
 COURSE TO BE REVIEWED (six years after UEC approval): January 2026
 Course outline form version: 05/18/2018

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ELTR 110		Number of Credits: 3 Course credit policy (105)															
Course Full Title: Electronics Manufacturing Processes Course Short Title: <i>(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)</i>																	
Faculty: Faculty of Applied and Technical Studies		Department (or program if no department): Electronics															
Calendar Description: Learn the basics of electronic manufacturing practices and techniques. Course topics include schematic capture, building component libraries, placing PCB components, generating manufacturing documents, and using electronic design automation tool. Gain knowledge about IPC standards and safe work place practices. Students will design, build, and assemble a PCB for an electronic project.																	
Prerequisites (or NONE):		None.															
Corequisites (if applicable, or NONE):		None.															
Pre/corequisites (if applicable, or NONE):		ELTR 100.															
Antirequisite Courses <i>(Cannot be taken for additional credit.)</i> Former course code/number: Cross-listed with: Dual-listed with: Equivalent course(s): <i>(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)</i>		Special Topics <i>(Double-click on boxes to select.)</i> This course is offered with different topics: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, topic will be recorded when offered.)</i>															
Typical Structure of Instructional Hours <table border="1"> <tr> <td>Lecture/seminar hours</td> <td>15</td> </tr> <tr> <td>Tutorials/workshops</td> <td></td> </tr> <tr> <td>Supervised laboratory hours</td> <td>30</td> </tr> <tr> <td>Experiential (field experience, practicum, internship, etc.)</td> <td></td> </tr> <tr> <td>Supervised online activities</td> <td></td> </tr> <tr> <td>Other contact hours:</td> <td></td> </tr> <tr> <td>Total hours</td> <td>45</td> </tr> </table>		Lecture/seminar hours	15	Tutorials/workshops		Supervised laboratory hours	30	Experiential (field experience, practicum, internship, etc.)		Supervised online activities		Other contact hours:		Total hours	45	Independent Study If offered as an Independent Study course, this course may be repeated for further credit: <i>(If yes, topic will be recorded.)</i> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit	
		Lecture/seminar hours	15														
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Other contact hours:																	
Total hours	45																
Transfer Credit Transfer credit already exists: <i>(See bctransferguide.ca.)</i> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Submit outline for (re)articulation: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, fill in transfer credit form.)</i>																	
Grading System <input checked="" type="checkbox"/> Letter Grades <input type="checkbox"/> Credit/No Credit																	
Maximum enrolment (for information only): 36 Expected Frequency of Course Offerings: Fall only <i>(Every semester, Fall only, annually, etc.)</i>																	
Department / Program Head or Director:		Date approved: November 2019															
Faculty Council approval		Date approved: November 14, 2019															
Dean/Associate VP: John English		Date approved: November 14, 2019															
Campus-Wide Consultation (CWC)		Date of posting: January 17, 2020															
Undergraduate Education Committee (UEC) approval		Date of meeting: January 31, 2020															

Learning Outcomes

Upon successful completion of this course, students will be able to:

- List and apply the major steps in PCB design process beginning with the specifications of the desired end product.
- Use computer aided design to produce a printed circuit board layout for given/any schematic.
- Hand solder through hole and surface mount components on PCB.
- Adjust, align, replace or repair electronic circuit and assemblies.
- Identify and describe quality of PCB layout as per IPC standards: IPC-A-610, IPC 7711/7721.
- Apply general safe work practices when working with hazardous products.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.)*

Lecture, lab work, and field trip to the PCB manufacturing company.

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials *(If more space is required, download Supplemental Texts and Resource Materials form.)*

Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1. No textbook required	Worksheets and lecture notes will be provided			
2.		<input type="checkbox"/>		
3.		<input type="checkbox"/>		
4.		<input type="checkbox"/>		
5.		<input type="checkbox"/>		

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

PCB Design Software, PCB Printing Machine, Consumables

Typical Evaluation Methods and Weighting

Final exam:	Assignments:	Field experience:	10%	Portfolio:	%	
Midterm exam:	Project:	50%	Practicum:	%	Other:	%
Quizzes/tests:	Lab work:	40%	Shop work:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

- Introduction to PCB design processes and tools
- Electrical and mechanical design parameters considerations
- Planning for design, fabrication, and assembly
- Manufacturing information and documentation
- PCB fabrication process-drilling, imaging, multilayer material, and processing
- PCB finishes and solderability
- PCB repair and rework
- Soldering repair and rework
- Acceptability and quality of fabricated and assembled boards