Washtenaw Community College Comprehensive Report

ELE 211 Basic Electronics
Effective Term: Fall 2024

Course Cover

College: Advanced Technologies and Public Service Careers
Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Electricity/Electronics
Course Number: 211
Org Number: 14400
Full Course Title: Basic Electronics
Transcript Title: Basic Electronics
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
Course description
Objectives/Evaluation
Rationale: Course updates
Proposed Start Semester: Winter 2024
Course Description: In this course, students will be introduced to basic electronics concepts and solid state devices. Topics will include the theory and application of light and temperature sensors, diodes, bipolar transistors, field effect transistors, thyristors and operational amplifiers. Using common laboratory equipment, students will build and test circuits.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 30 **Student:** 30
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

Prerequisite
ELE 111 minimum grade "C-"

General Education

Request Course Transfer

Proposed For:

Eastern Michigan University
Ferris State University
Wayne State University

Student Learning Outcomes

1. 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.
   Assessment 1
   Assessment Tool: Outcome-related lab project
   Assessment Date: Winter 2026
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Rubric
   Standard of success to be used for this assessment: 70% of students will score 70% or better on the outcome-related lab project
   Who will score and analyze the data: Departmental faculty

2. Identify the properties of transistors and analyze their behavior in circuits.
   Assessment 1
   Assessment Tool: Outcome-related final exam questions
   Assessment Date: Winter 2026
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 70% of students will score 70% or better on the outcome-related final exam questions
   Who will score and analyze the data: Departmental faculty

3. Identify the properties of operational amplifiers and analyze their behavior in circuits.
   Assessment 1
   Assessment Tool: Outcome-related final exam questions
   Assessment Date: Winter 2026
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 70% of students will score 70% or better on the outcome-related final exam questions
   Who will score and analyze the data: Departmental faculty

Course Objectives

1. Construct and test the following circuits:
   a. half-wave rectifier
   b. conventional full-wave rectifier
   c. bridge full-wave rectifier
   d. Zener regulator
2. Construct and test the following circuits:
   a. small signal amplifier

b. transistor switch
c. multistage amplifiers with negative feedback
d. bipolar junction transistor (BJT) power amplifiers
e. field-effect transistor (FET) amplifiers
f. operational amplifiers

3. Construct and test the following circuits:
a. silicon-controlled rectifier (SCR) static switch
b. SCR phase control
c. a photoresistor switch circuit
d. sensor circuits

New Resources for Course

Course Textbooks/Resources

Textbooks
Stephen Herman. *Electronics for Electricians*, ed. Cengage, 2016, ISBN: 978-130550599.
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Other: ELE department laboratory (TI 145) with ELE department electronic test equipment. Dual DC power supply, function generator, oscilloscope, electronic parts kit.

Reviewer	Action	Date
Faculty Preparer:		
Jim Popovich	*Faculty Preparer*	*Aug 14, 2023*
Department Chair/Area Director:		
Allan Coleman	*Recommend Approval*	*Aug 16, 2023*
Dean:		
Jimmie Baber	*Recommend Approval*	*Aug 17, 2023*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Apr 23, 2024*
Assessment Committee Chair:		
Jessica Hale	*Recommend Approval*	*May 01, 2024*
Vice President for Instruction:		
Brandon Tucker	*Approve*	*May 01, 2024*

Washtenaw Community College Comprehensive Report

ELE 211 Basic Electronics
Effective Term: Winter 2020

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Electricity/Electronics
Course Number: 211
Org Number: 14400
Full Course Title: Basic Electronics
Transcript Title: Basic Electronics
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
Consultation with all departments affected by this course is required.
Course description
Distribution of contact hours
Pre-requisite, co-requisite, or enrollment restrictions
Outcomes/Assessment
Objectives/Evaluation
Other:
Rationale: 3 year review including addition of student learning outcomes which had not been brought forward from the older syllabus into CurricUnet.
Proposed Start Semester: Winter 2020
Course Description: In this basic electronics course, students are introduced to solid state devices. Topics will include the theory and application of diodes, bipolar transistors, field effect transistors, thyristors and operational amplifiers. Using common laboratory equipment, students will build and test circuits.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 30 **Student:** 30
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

Prerequisite

ELE 111 minimum grade "C-"

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify the properties of diodes and analyze their behavior in circuits.
   Assessment 1
   Assessment Tool: Standardized Final Exam
   Assessment Date: Winter 2022
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-developed answer key
   Standard of success to be used for this assessment: 70% of students will score 70% or better on the final exam questions relevant to this outcome. (Each student's score for this outcome will be computed by averaging their scores on the final exam questions relevant to this outcome.)
   Who will score and analyze the data: Faculty who teach this course

2. Identify the properties of transistors and analyze their behavior in circuits.
   Assessment 1
   Assessment Tool: Standardized Final Exam
   Assessment Date: Winter 2022
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-developed answer key
   Standard of success to be used for this assessment: 70% of students will score 70% or better on the final exam questions relevant to this outcome. (Each student's score for this outcome will be computed by averaging their scores on the final exam questions relevant to this outcome.)
   Who will score and analyze the data: Faculty who teach this course

3. Identify the properties of operational amplifiers and analyze their behavior in circuits.
   Assessment 1
   Assessment Tool: Standardized Final Exam
   Assessment Date: Winter 2022
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-developed answer key
   Standard of success to be used for this assessment: 70% of students will score 70% or better on the final exam questions relevant to this outcome. (Each student's score for this outcome will be computed by averaging their scores on the final exam questions relevant to this outcome.)
   Who will score and analyze the data: Faculty who teach this course

Course Objectives

1. Construct and test the following circuits:
   a. half-wave rectifier

b. conventional full-wave rectifier
c. bridge full-wave rectifier
d. zener regulator

2. Troubleshoot and repair the circuits listed in item 1 after the instructor has injected a fault. The repaired circuits must function in accordance with the parameters specified by the instructor.
3. Construct and test the following circuits:
   a. small signal amplifier
   b. transistor switch
   c. multistage amplifiers with negative feedback
   d. BJT power amplifiers
   e. FET amplifiers
   f. operational amplifiers
4. Troubleshoot and repair the circuits listed in item 3 after the instructor has injected a fault. The repaired circuits must function in accordance with the parameters specified by the instructor.
5. Construct and test the following circuits:
   a. SCR static switch
   b. SCR phase control
   c. a photoresistor switch circuit
   d. sensor circuits
6. Troubleshoot and repair the circuits listed in item 5 after the instructor has injected a fault. The repaired circuits must function in accordance with the parameters specified by the instructor.

New Resources for Course

Course Textbooks/Resources

Textbooks

Stephen Herman. *Electronics for Electricians*, ed. Cengage, 2016, ISBN: 978-130550599.

Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Other: ELE department laboratory (TI 145) with ELE department electronic test equipment.

Reviewer	Action	Date
Faculty Preparer:		
Dale Petty	*Faculty Preparer*	*Jun 26, 2019*
Department Chair/Area Director:		
Thomas Penird	*Recommend Approval*	*Jul 02, 2019*
Dean:		
Brandon Tucker	*Recommend Approval*	*Jul 08, 2019*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Aug 23, 2019*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Sep 10, 2019*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Sep 11, 2019*