

Glendale College

Course Outline of Record Report

Course ID 001450
Revision - April 2025

ECT201 : Solid-State Devices

General Information

| | |
|---|---|
| Author: | <ul style="list-style-type: none"> Christopher Herwerth |
| Course Code (CB01) : | ECT201 |
| Course Title (CB02) : | Solid-State Devices |
| 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) : | C - Clearly Occupational |
| Distance Education Approved: | No |
| Will this course be taught asynchronously?: | Yes |
| Course Control Number (CB00) : | CCC000575689 |
| Curriculum Committee Approval Date: | 04/23/2025 |
| Board of Trustees Approval Date: | 06/17/2025 |
| Last Cyclical Review Date: | 04/23/2025 |
| Course Description and Course Note: | ECT 201 explores solid-state semiconductor theory, through the use of semiconductor electronics such as diode rectifiers, filtered power supplies, transistor and amplifiers, oscillators, and thyristor devices. Students construct solid-state circuits and perform circuit analysis and diagnostics of electronic parameters using state-of-the-art digital electronic test equipment. |
| Justification: | Mandatory Revision |
| Academic Career: | <ul style="list-style-type: none"> Credit |
| Mode of Delivery: | <ul style="list-style-type: none"> In-Person Remote Online |
| Author: | No value |
| Course Family: | No value |

Academic Senate Discipline

| | |
|-----------------------|--|
| Primary Discipline: | <ul style="list-style-type: none"> Electronic Technology (Radio, television, computer repair, avionics) |
| 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

Transferable to CSU only

Transferability Status

Approved

Units and Hours

Summary

| | |
|--|-----|
| Minimum Credit Units (CB07) | 3 |
| Maximum Credit Units (CB06) | 3 |
| Total Course In-Class (Contact) Hours | 54 |
| Total Course Out-of-Class Hours | 108 |
| Total Student Learning Hours | 162 |

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 | 3 | 6 |
| Laboratory Hours | 0 | 0 |
| Studio Hours | 0 | 0 |

Course Student Hours

| | |
|--|----|
| Course Duration (Weeks) | 18 |
| Hours per unit divisor | 0 |
| Course In-Class (Contact) Hours | |
| Lecture | 54 |

| | |
|----------------------------------|-----|
| Laboratory | 0 |
| Studio | 0 |
| Total | 54 |
| Course Out-of-Class Hours | |
| Lecture | 108 |
| Laboratory | 0 |
| Studio | 0 |
| Total | 108 |

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

Prerequisite

ECT110 - Electricity and Electronics Principles

Objectives

- Determine the value of resistors from their color code, measure DC (Direct Current) and AC (Alternating Current) voltage.
- Identify conductors and insulators, and test common types of switches.
- Measure current in a circuit, verify ohms law, investigate errors in measurement.
- Design a series and parallel circuit that will meet specified resistance requirements.
- Develop a general rule for calculating the voltage across each resistor in an unloaded and loaded resistive voltage divider.
- Develop methods of troubleshooting circuits using voltage, current, capacitor, and resistance measurements.
- Identify the operating controls of an oscilloscope.
- Identify the controls and features of an audio frequency generator.
- Describe the effect of AC and DC electrical motors and inductance.
- Identify and measure affect transformers and magnetic relays and contactors.

OR

Co-Requisite

ECT110 - Electricity and Electronics Principles

(ECT 110 may be taken concurrently)

Entry Standards

| Entry Standards | Description |
|---|-------------|
| Describe basic laboratory equipment and components. | 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 | Discussion |
|------------------------|------------|

| | |
|------------------------|------------|
| Methods of Instruction | Multimedia |
|------------------------|------------|

| | |
|------------------------|------------------------|
| Methods of Instruction | Collaborative Learning |
|------------------------|------------------------|

| | |
|------------------------|----------------|
| Methods of Instruction | Demonstrations |
|------------------------|----------------|

| | |
|------------------------|---------------|
| Methods of Instruction | Presentations |
|------------------------|---------------|

Out of Class Assignments

- Problems (e.g., solve applied electronics circuit analyses)
- Final project (e.g., design voltage dividers and BJT amplifier)

| Methods of Evaluation | Description of Activity/Interaction |
|-----------------------|---|
| Exam/Quiz/Test | Quizzes |
| Exam/Quiz/Test | Examination at the end of each instruction module |
| Project/Portfolio | Final project |
| Exam/Quiz/Test | Final examination |

Textbook Rationale
 This is the latest edition of the text

Textbooks

| Author | Title | Publisher | Date | ISBN |
|------------------|---|-------------------------|------|----------------|
| Floyd, Thomas L. | Electronic Devices (Conventional Current Version) | Pearson Education, Inc. | 2018 | 978-1292222998 |

Other Instructional Materials (i.e. OER, handouts)
 No Value

Learning Outcomes

Course Objectives

Construct solid-state diode and transistor circuits, using appropriate circuit components and properly following schematic diagrams.

Use proper electronics test equipment to evaluate and apply measurement results in circuit diagnostics and repairs.

Develop and run diagnostic programs in BASIC, FORTRAN, or PASCAL which analyze solid-state circuit parameters.

Solve problems in semiconductor theory and analyze solid-state circuit theorems and concepts.

SLOs

| | |
|---|------------------------------------|
| Design appropriate circuits using solid state devices and following schematics and diagrams. | Expected Outcome Performance: 70.0 |
| Analyze and troubleshoot complex solid-state diodes, and transistor circuits. | Expected Outcome Performance: 70.0 |
| Demonstrate skillful use of electronic testing equipment to analyze and troubleshoot circuit defects. | Expected Outcome Performance: 70.0 |

Course Content

Lecture Content

Semiconductor Theory (2 hours)

- Atomic structure
- Crystalline P-N Material
- Semiconductor current

The PN Junction Diode (3 hours)

- PB junction barrier
- Forward-reverse bias
- PN diode characteristics

Junction Diode Circuits (3 hours)

- Rectifiers
- Regulated power supplies
- Special diode devices

Bipolar Junction Transistors (BJT) (3 hours)

- BJT construction
- PNP-NPN configurations
- Static transistor characteristics

Bipolar Junction Transistors (BJT) Configurations (3 hours)

- Common emitter
- Common collector (emitter follower)
- Common base

Bipolar Junction Transistors (BJT) Dynamic Applications (3 hours)

- Gain analysis
- Impedance matching
- Frequency response

Bipolar Junction Transistors (BJT) Amplifier Circuits (4 hours)

- Small signal amplifiers
- Large signal amplifiers
- Tuned amplifiers

Introduction to Field-Effect Transistors (FET) (4 hours)

- Field effect construction
- Junction FET (JFET)
- Metal Oxide Semiconductor FET (MOSFET)

Field-Effect Transistors (FET) Biasing (4 hours)

- Characteristic curves
- JFET transfer characteristics
- Biasing circuits

Field-Effect Transistors (FET) Amplifier Circuits (4 hours)

- JFET configurations
- Dynamic FET amplifier analysis
- Enhancement-Depletion Mode MOSFET

Power Amplifiers (4 hours)

- Amplifiers classes
- Power amplifiers characteristics
- Symmetrical amplifiers

Feedback Amplifiers (3 hours)

- Feedback concepts
- Negative Feedback
- Amplifier Circuits
- Positive feedback

Introduction to Oscillators (3 hours)

- Oscillation criteria

- Phase-Shift Oscillators
- The Hartley
- Oscillator Principles

Oscillator Circuits (3 hours)

- Low frequency oscillators
- Crystal Controlled Oscillator Circuits
- Multivibrators

Thyristor Devices (3 hours)

- Unijunction transistor
- Silicon Controlled Rectifier (SCR)
- DIAC-TRIAC Circuits

Wave Shaping Circuits (3 hours)

- Clipping circuits
- Clamping circuits
- Differentiation circuits

BJT Biasing (2 hours)

- Characteristic curves
- Load lines
- Designing bias components

Total Hours: 54

Additional Information

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Is it possible this course will have a material fee?

No

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

Yes

What term(s) will this course be offered?

Fall/Spring

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

Resources

Did you contact your departmental library liaison?

Yes

If yes, who is your departmental library liaison?

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

Did you contact the DEIA liaison?

Yes

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