

Glendale College

Course Outline of Record Report

Course ID 010272
Revision - April 2025

ECT163 : Energy Management

General Information

Author:	<ul style="list-style-type: none"> Christopher Herwerth
Course Code (CB01) :	ECT163
Course Title (CB02) :	Energy Management
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) :	CCC000575337
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 163 covers key aspects of energy management and prepares students to enter the job market as energy managers and energy professionals. Students study the concepts of greenhouse gas emissions management and energy savings. Students are also prepared for passing the Certified Energy Management (CEM) examination and becoming certified by the Association of Energy Engineers (AEE).
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

Advisory

ECT110 - Electricity and Electronics Principles

Objectives

- Develop methods of troubleshooting circuits using voltage, current, capacitor, and resistance measurements.
- Identify the operating controls of an oscilloscope.

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	Multimedia
Methods of Instruction	Demonstrations
Methods of Instruction	Guest Speakers

Out of Class Assignments
<ul style="list-style-type: none"> Energy efficiency design project (e.g., given existing building parameters, create a more energy efficient design using modern materials and systems) Energy audit analysis report (e.g., write a work plan based on energy efficiency audit results)

Methods of Evaluation	Description of Activity/Interaction
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Mid-term examination
Exam/Quiz/Test	Final examination

Textbook Rationale
No Value

Textbooks				
Author	Title	Publisher	Date	ISBN
Ratnakumaran	Energy Management	MJP Publishers	2021	9788180942679

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

No Value

Learning Outcomes

Course Objectives

Describe energy efficiency and cost reduction.

Describe greenhouse gas emissions and how to improve air quality.

Cultivate good communications abilities on energy concerns.

Discuss effective monitoring, reporting, and management strategies for wise energy use.

Demonstrate ways to increase returns from energy investments through research and development.

Explain the impacts of curtailments, brownouts, or any interruption in energy supplies.

SLOs

Compare the relative contributions of various energy usages such as lighting and Heating Ventilation, and Air Conditioning (HVAC) in the energy auditing process. Expected Outcome Performance: 70.0

Model and evaluate energy management control systems. Expected Outcome Performance: 70.0

Design an efficient energy usage system that satisfies technical requirements while limiting adverse effects such as greenhouse gas emissions. Expected Outcome Performance: 70.0

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 to Energy Management (6 hours)

- Need for energy management
- Designing an energy management program
- Energy accounting
- Energy monitoring, targeting and reporting
- Model energy management program

Process of Energy Audit (5 hours)

- Energy audit preparation
- Facility inspection tools
- Implementing the audit recommendation
- Regulatory agencies of the United States

Introduction to Categories of Costs for Capital Investment (5 hours)

- Cash flow analysis
- Utility incentives and rebates
- Cash flow diagrams and tables
- Cost analysis methodology
- Energy financing options

Lighting Systems (6 hours)

- Lamp characteristics
- Luminaires, lenses, diffusers and reflectors
- Lighting survey and safety issues
- Measuring light levels
- Advanced lighting guidelines and lighting equipment accessories

Heating, Ventilating, and Air Conditioning (HVAC) (5 hours)

- HVAC components, efficiency ratings and loads
- Energy efficiency rating for HVAC systems
- Outdoor air requirements for ventilation
- HVAC control systems for high-efficiency air conditioners
- Thermal storage systems

Managing Boilers and Steam Distribution Systems (5 hours)

- Boiler components, controls and fuel
- Heat balance for boilers
- Steam distribution systems components
- Steam and condensate system analysis

Energy Management Controls (5 hours)

- Automatic and central controllers systems
- Web based building automation systems
- DOE -2.1D computer simulation program
- Modeling and analysis of HVAC systems with EMCS

Maintenance Program and Planning (5 hours)

- Energy maintenance procedure
- Maintenance monitoring progress and analysis
- Instruments for maintenance inspection
- Maintenance schedule for industrial and commercial facilities

Motors, Compressed Air Systems and Water Management (5 hours)

- Motors and adjustable speed drives
- High efficiency motor load factor

- Air dryers, filters and controls
- Pressure drop process and calculation
- Cooling tower water management

Green Buildings and Greenhouse Gas Emissions Management (7 hours)

- Green construction materials and methods
- Rating systems for green buildings
- Leadership in Energy and Environmental Design (LEED)
- Rating systems and analysis
- Assessment of greenhouse gases and climate change
- Measurement and verification for LEED projects

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 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 liason?

No Value

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