Western Technical College

10481113 Project Investment Appraisal

Course Outcome Summary

Course Information

Description	Students will study the concepts of energy modeling, energy optimization, energy reduction strategies, and cost benefit analysis. They will research incentives, financial impacts of lighting retrofits, envelope improvements, and energy management plans. Students will also learn and apply the financial concepts of simple payback, internal rates of return and net present value. The software taught and applied in this course will include: Microsoft excel, REMrate, BEopt, and eQUEST.
Career Cluster	Architecture and Construction
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	54

Pre/Corequisites

Prerequisite 10481108 Energy Modeling 2

Textbooks

Energy: Management, Supply and Conversation. 2nd Edition. Copyright 2009. Beggs, Clive. Publisher: Taylor & Francis. **ISBN-13**: 978-0-7506-8670-9. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Cultivate Passion: Expand a Growth-Mindset
3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Embrace Sustainability
5. Live Responsibly: Foster Accountability
6. Refine Professionalism: Act Ethically

7. Refine Professionalism: Improve Critical Thinking
8. Refine Professionalism: Participate Collaboratively
9. Refine Professionalism: Practice Effective Communication

Course Competencies

1. Analyze building energy consumption.

Assessment Strategies

1.1. Project
1.2. Written Product

Criteria

You will know you are successful when:

1.1. you calculate total energy consumption from utility bills
1.2. you calculate energy use intensity
1.3. you calculate square footage
1.4. you estimate energy use for heating
1.5. you estimate energy use for cooling
1.6. you estimate energy use for lighting
1.7. you estimate energy used for appliance/plug load

Learning Objectives

1.a. Determine energy consumption using utility bills
1.b. Analyze building energy consumption using energy modeling software

2. Estimate costs of energy conservation measures.

Assessment Strategies

2.1. Presentation
2.2. Written Product

Criteria

You will know you are successful when:

2.1. you estimate the cost of a lighting upgrade
2.2. you estimate the cost of an appliance upgrade
2.3. you estimate the cost of an envelope upgrade
2.4. you estimate the cost of an HVAC upgrade
2.5. you estimate the cost of a renewable energy system

Learning Objectives

2.a. Estimate material costs for energy conservation measures
2.b. Estimate labor costs for energy conservation measures
2.c. Estimate operational costs of energy conservation measures
2.d. Estimate maintenance costs of energy conservation measures

3. Estimate savings of energy conservation measures.

Assessment Strategies

3.1. Written Product
3.2. Presentation

Criteria

You will know you are successful when:

3.1. you calculate the savings of a renewable energy system
3.2. you calculate the savings of a lighting upgrade
3.3. you calculate the savings of an HVAC upgrade
3.4. you calculate the savings of an appliance/plug load upgrade
3.5. you calculate the savings of a building envelope upgrade

Learning Objectives

3.a. Estimate operational savings
3.b. Estimate maintenance savings

4. Determine cost effectiveness of energy conservation measures.

Assessment Strategies

4.1. Written Product
4.2. Presentation

Criteria

You will know you are successful when:

4.1. you calculate the payback for lighting upgrades.
4.2. you calculate the payback for HVAC upgrades
4.3. you calculate the payback for building envelope upgrades
4.4. you calculate the payback for renewable energy system upgrades
4.5. you calculate the payback for appliance/plug loads

Learning Objectives

4.a. Determine payback in years of energy conservation measures
4.b. Determine discounted cash flow of energy conservation measures
4.c. Compare cost benefit of various energy conservation measures

5. Summarize available financial incentive programs.

Assessment Strategies

5.1. Written Product
5.2. Presentation

Criteria

You will know you are successful when:

5.1. you identify applicable incentive programs for a given project
5.2. you research federal incentive programs
5.3. you research state incentive programs
5.4. you research local incentive programs
5.5. you calculate the savings of incentives programs

Learning Objectives

5.a. Identify applicable incentives for energy conservation measures
5.b. Examine the application process for incentives

6. Select energy conservation measures appropriate to project.

Assessment Strategies

6.1. Written Product
6.2. Presentation

Criteria

You will know you are successful when:

6.1. you recommend cost effective energy conservation measures
6.2. you meet with the customer/client to discuss energy conservation measures
6.3. you rank the energy conservation measures in terms of cost effectiveness
6.4. you match customer/client needs with energy conservation measure recommendations

Learning Objectives

6.a. Identify customer/client goals
6.b. Select appropriate energy conservation measures