



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

| Course Code | Course Name | Credits | Contact Hours |
|-------------|------------------------------|---------|---------------|
| 0401583 | Electrical Energy Management | 3 | 3 T |

INSTRUCTOR/COORDINATOR

| | |
|---------------------|--|
| Name | Dr. Ziyad S. Almajali |
| Email | ziyad@mutah.edu.jo ziadmaj@yahoo.com |
| Office Hours | 9:00-10:00 (Sun, Tues, Thurs) |

TEXTBOOK

| | |
|-------------------------------------|---|
| Title | Energy Management Handbook. |
| Author/Year/Edition | Wayne C. Turner and Steve Doty. 6th edition. |
| Other Supplemental Materials | |
| Title | Guide to Energy Management |
| Author/Year/Edition | Barney L. Capehart, Wayne C. Turner and William J. Kennedy. 4th Edition |

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

Introductory concepts engineering management overview of energy consumption and its affects, Energy saving technologies industrial and process energy flows, lifecycle energy analysis and energy accounting energy management and monitoring and targeting, demand side management, energy audits and energy modeling, decision process.

B. Pre-requisites (P) or Co-requisites (C)

Power Systems (2) (0401482) (P)

C. Course Type (Required or Elective)

Elective

SPECIFIC GOALS

A. Course Learning Outcomes (CLOs)

By the end of this course, the student should be able to:

CLO1: Recognize different energy types and sources, energy demand and supply [1]

CLO2: Students will sense the requirement for the efficient use of energy resources [1]

CLO3: Study and develop energy managerial skills to assess alternative approaches regarding energy conservation and recognize various auditing steps [1].

CLO4: Study of different types of electrical loading and concepts and techniques of efficiency evaluation and improving and reducing operating costs. Students will learn the basics for energy monitoring system design for energy consumption analysis and optimization [1].

CLO5: Students will understand the economic aspects related to energy management [4].

B. Student Learning Outcomes (SOs) Addressed by the Course

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ✓ | | | ✓ | | | |

BRIEF LIST OF TOPICS TO BE COVERED

| List of Topics | No. of Weeks | Contact Hours |
|--|--------------|---------------|
| Introduction Basics of Energy and its Various Forms | 1 | 3 |
| Energy classification World Energy Scenario | 1 | 3 |
| Energy Management Auditing Energy analysis techniques | 2 | 3 |
| Power factor | 1 | 3 |
| Electricity rate | 1 | 3 |
| Nameplate Motor load and efficiency Motor derating factors | 1 | 3 |
| Variable speed drive | 1 | 6 |
| Pumps and Pumping System | 1 | 3 |
| Compressed Air System | 1 | 3 |
| Light source and performance | 1 | 3 |
| Plug load management | 1 | 3 |
| UPS | 1 | 3 |
| Furnaces | 1 | 3 |
| Total | 14 | 42 |

| EVALUATION | | |
|---|--------------------------------------|-------------------|
| Assessment Tool | Due Date | Weight (%) |
| Mid Exam | According to the university calendar | 30 |
| Course Work (Homeworks, Quizzes, Projects, ...etc.) | One week after being assigned | 20 |
| Final Exam | According to the university calendar | 50 |

| ABET's Students Learning Outcomes (Criterion # 3) | | |
|--|---|---|
| | Relationship to program outcomes | |
| ABET 1-7 | Engineering Student Outcomes | |
| 1 | √ | an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics |
| 2 | | an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. |
| 3 | | an ability to communicate effectively with a range of audiences. |
| 4 | √ | an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. |
| 5 | | an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. |
| 6 | | an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. |
| 7 | | an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. |