



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering

| Course Code | Course Name | Credits | Contact Hours |
|----------------|--|---------|---------------|
| 0401584 | Reliability and Economics of power Systems | 3 | 3 T |

| INSTRUCTOR/COORDINATOR | |
|------------------------|--|
| Name | Prof. Hussein Al-Majali |
| Email | halmajali@mutah.edu.jo halmajali@yahoo.com |
| Office Hours | 11:00-12:00 (Sun, Tues, Thur) |

| TEXTBOOK | |
|------------------------------|---|
| Title | Fundamentals of Power System Economics, 2nd Edition |
| Author/Year/Edition | Daniel S. Kirschen, Goran Strbac, Wiley/2018/ 2 nd Ed |
| Other Supplemental Materials | |
| Title | The Economics of Power System Reliability and Planning |
| Author/Year/Edition | Walter G. Scott <i>and</i> Mark Gellerson, Johns Hopkins University Press,1979/ |

| SPECIFIC COURSE INFORMATION |
|--|
| A. Brief Description of the Content of the Course (Catalog Description) |
| Deterministic techniques for reliability evaluation; Probabilistic techniques for reliability evaluation of generation, transmission and distribution subsystems; cost of outages; reliability versus economics. |
| B. Pre-requisites (P) or Co-requisites (C) |
| |
| 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: Learn the basics of the reliability techniques [1]

CLO2: Evaluation of generation, transmission and distribution subsystems [2]

CLO3: Be able to analysis the reliability versus economics [4]

B. Student Learning Outcomes (SLOs) 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 |
|---|--------------|---------------|
| Chapter 1: Introduction to reliability | 1 | 3 |
| Chapter 2: Reliability evaluation techniques | 2 | 6 |
| Chapter 3: Probabilistic techniques for reliability | 2 | 6 |
| Chapter 4: Evaluation of generation | 1 | 3 |
| Chapter 5: Evaluation of transmission | 1 | 3 |
| Chapter 6: Evaluation of distribution subsystems | 2 | 6 |
| Chapter 7: Cost of outages | 3 | 9 |
| Chapter 8: Reliability versus economics. | 2 | 6 |
| Tutorial classes if needed. | | |
| <i>Total</i> | <i>14</i> | <i>42</i> |

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 outcome | |
|-------------|---------------------------------|---|
| ABET 1-7 | | |
| 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. |