The University of Jordan

Accreditation & Quality Assurance Center

Curriculum for Master Degree

Program Name:
Electrical Engineering/Power
(Thesis Track)
1. School: Engineering
2. Department: Electrical Engineering
3. Program title (Arabic): ماجستير الهندسة الكهربائية/قوى
4. Program title (English): Master in Electrical Engineering/Power
5. Track: Thesis

First: General Rules & Conditions:

<table>
<thead>
<tr>
<th>Plan Number</th>
<th>specialization</th>
<th>Degree</th>
<th>Dep#</th>
<th>School #</th>
<th>Year</th>
<th>Track</th>
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<td>31</td>
<td>8</td>
<td>03</td>
<td>09</td>
<td>2017</td>
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<td>Thesis</td>
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1. This plan conforms to the valid regulations of the programs of graduate studies.
2. Specialties of Admission:
   - The First Priority: Bachelor in Electrical Engineering, Bachelor in Electrical Power Engineering

Second: Special Conditions: None.

Third: Study Plan: Studying (33) credit hours as following:

1. Obligatory Courses (15) credit hours:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hrs.</th>
<th>Theory</th>
<th>Practical</th>
<th>Pre/Co-requisite</th>
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<tbody>
<tr>
<td>0903777</td>
<td>Research Methodology</td>
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AQAC-F-011-1
2. Elective Courses: Studying (9) credit hours from the following:

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<thead>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credit Hrs.</th>
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<tbody>
<tr>
<td>0943701</td>
<td>Digital Signal Processing and Filtering</td>
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<td>Advanced Control Systems</td>
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<tr>
<td>0923771</td>
<td>Electrical Machines and Drives</td>
<td>3</td>
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<td>0903780</td>
<td>Smart Grids and Sustainable Electricity</td>
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<td>0923781</td>
<td>High Voltage Engineering</td>
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<td>Power System Planning and Reliability</td>
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<td>Advanced Power Electronics</td>
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<td>0943787</td>
<td>Power Distribution Systems</td>
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</tr>
<tr>
<td>0923788</td>
<td>Power Systems Quality</td>
<td>3</td>
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</table>

3. Thesis: (9) Credit hours (0903799).

*Notes*
Course Description

0943701 Digital Signal Processing and Filtering (3 credits)

0933741 Linear Systems (3 credits)

0923742 Advanced Control Systems (3 credits)

0923771 Electrical Machines and Drives (3 credits)

0903777 Research Methodology (3 credits)

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0903780 Smart Grids and Sustainable Electricity

0923781 High Voltage Engineering

0923782 Power System Planning and Reliability
Load Forecasting: peak demand and energy. Generation planning: capacity resource planning (conventional and nonconventional power plants), reliability and capacity reserve, generation expansion, cost analysis. Transmission planning: concepts, corridor selection for determining physical and electrical characteristics of lines to be constructed, reliability analysis. Distribution planning: types of distribution systems, planning for reliability, distribution system engineering: substation location, sizing and feeder location. Impact of renewable generation and deregulation on power system planning.

0923783 Power System Stability and Control

0923784 Advanced Power Electronics
voltage DC transmission, flexible AC transmission systems, static VAR compensation, interconnection of renewables to the utility grid.

0923785 Advanced Power System Protection (3 credits)

0933786 Renewable Energy and Distributed Generation (5 credits)

0943787 Power Distribution Systems (3 credits)

0923788 Power Systems Quality (3 credits)

0933789 Power System Operation and Economics (3 credits)
Introduction to optimization and optimal economic system operation. Economic dispatch. Unit commitment. Electricity markets (forward and spot markets). Price risk management and contracts. Optimal power flow. Locational marginal pricing. Power...

0903799 Thesis

(9 credits)
The University of Jordan

Accreditation & Quality Assurance

Curriculum for Master Degree

Program Name:

Electrical Engineering

(None Thesis Track)
1. School

2. Department

3. Program title (Arabic): ماجستير في الهندسة الكهربائية ومجالات الطاقة

4. Program title (English): Master in Electrical Engineering Power

5. Track: None Thesis

First: General Rules & Conditions:

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1. This plan conforms to the valid regulations of the programs of graduate studies.

2. Specialties of Admission:

- The First Priority: Bachelor in Electrical Engineering, Bachelor in Electrical Power Engineering

Second: Special Conditions: None.

Third: Study Plan: Studying (33) credit hours as following:

1. Obligatory Courses (24) credit hours:

AQAC-F-011-1
2. Elective Courses: Studying (9) credit hours from the following:

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Comprehensive Exam 0930796

*Notes*
Course Description

0943701 Digital Signal Processing and Filtering (3 credits)

0933741 Linear Systems (3 credits)

0923742 Advanced Control Systems (3 credits)

0923771 Electrical Machines and Drives (3 credits)

0903777 Research Methodology (3 credits)

AQAC-F-011-1
0903780 Smart Grids and Sustainable Electricity (3 credits)

0923781 High Voltage Engineering (3 credits)

0923782 Power System Planning and Reliability (3 credits)
Load Forecasting: peak demand and energy. Generation planning; capacity, resource planning (conventional and non-conventional power plants), reliability and capacity reserve, generation expansion, cost analysis. Transmission planning: concepts, corridor selection for determining physical and electrical characteristics of lines to be constructed, reliability analysis. Distribution planning: types of distribution systems, planning for reliability, distribution system engineering, substation location, sizing and feeder location. Impact of renewable generation and power system planning.

0923783 Power System Stability and Control (3 credits)

0925784 Advanced Power Electronics (3 credits)

AQAC-F-011
voltage DC transmission, flexible AC transmission systems, static VAR compensation, interconnection of renewables to the utility grid.

0923785 Advanced Power System Protection

Power system protection relay, directional overcurrent, undercurrent, distance, phase comparison, blocking, and direct transfer trip. Relay protection schemes and field testing. Basic protection principles: line differential, transformer differential, and bus-bar differential. Low and high impedance bus-bar protection. Numerical relaying: introduction, protection philosophy, basic hardware and protection schemes, protection algorithms, microprocessor application to protective relays, MatLab simulation of numerical relays. Communication schemes for power systems protection: power line carrier, optical fiber, and microwave. Protection schemes for the distribution network with distributed generations: protection philosophies and challenges. Design characteristics of protective relays including FUs and protective relays in substations.

0933786 Renewable Energy and Wind Power


0943787 Power Distribution Systems


0923788 Power Systems Quality


0933789 Power Systems Operation and Economics

Introduction to optimization and economic dispatch. Unit commitment. Electricity markets, economic dispatch, spot market, price risk management and contracts. Optimum power flow, load flow, reliability, risk management. Power...
system security, Generation investments, Loading and pricing of transmission networks, Impacts of high penetration of renewable generation on power system operation. Role of storage and demand side management.

0903798 Comprehensive Exam.