جامعة أم القرى

كلية الهندسة والعمارة الإسلامية

الدبلوم العالي في هندسة نظم التوزيع الكهربائية

Program units and courses	Units	Courses	Units	Courses	Units	Courses	Units	Courses	Units	Courses	Units	Courses
compulsory courses	21	7	24	8	12	6	18	6	32	4	15	5
Elective courses	-	-	-	-	14	7	9	3	32	4	6	2
Thesis - Research Project	3	1	3	1	4	1	3	1	8	1	3	1
Total	24	8	27	9	30	14	30	10	72	9	24	8

Note: The above indicated local programs (Only Program 1) is the closest similar higher diploma programs in Saudi Arabia. Thus, our program is the first higher diplom program in Electrical Engineering.

4. Learning and Teaching

4/1 Learning Outcomes and Graduate Specifications

4/1/1 Main tracks or specializations covered by the program:

Electrical distribution systems.

4/1/2 Curriculum Study Plan Table

Level	Course Code	Course Title	Required or Elective	Prerequisite Courses	Credit Hours
Level 1	802501	Design of Electric Power Distribution Systems	Required	Department Consent	3
	802502	Distribution System Planning	Required	Department Consent	3
	802503	Electric Power Quality	Required	Department Consent	3
	802504	Sustainable Distributed Generation	Required	Department Consent	3
Level 2	802505	Distribution System Reliability	Required	Department Consent	3
	802511	Applied Project	Required	None	3
	802506	Electric Safety and Grounding System Design	Elective	Department Consent	3
	802507	Restructed Electricity Market	Elective	Department Consent	3
	802508	Distribution System Protection	Elective	Department Consent	3
	802509	Smart Grids	Elective	Department Consent	3
	802510	Special Topics in Power Distribution Systems	Elective	Department Consent	3

Include additional levels or courses if needed

f)	Description of Research Project or Scientific Thesis Assessment Procedures (Including Assessment Rubrics) **The Faculty Advisor will provide the assessment procedures.**

4.1 Course Specification:

The corresponding course specification for all available courses in both tracks are described as follows.

Course Title: **Design of Electric Power Distribution Systems**

Course Code: **802501**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **Design Of Electric Power Distribution Systems (802501)**		
2. Credit hours: **3**		
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)		
4. Name of faculty member responsible for the course : **TBD**		
5. Level/year at which this course is offered: **Level 1**		
6. Pre-requisites for this course (if any): **Department Consent**		
7. Co-requisites for this course (if any):		
8. Location if not on main campus: **N/A**		
9. Mode of Instruction (mark all that apply):		
a. Traditional classroom	√ percentage?	100
b. Blended (traditional and online)	percentage?	
c. E-learning	percentage?	
d. Correspondence	percentage?	
f. Other	percentage?	
Comments:		

B. Objectives

1. The main objective of this course

This course introduces topics on distribution system, load types, load characteristics, load calculation, primary distribution system, secondary distribution system, distribution substation, power loss and voltage regulation, electric installation and standards and power factor improvement.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered		
List of Topics	**No. of Weeks**	**Contact hours**
Introduction	**1**	**3**
Load types, characteristics and load calculation.	**2**	**6**
Design considerations for primary and secondary distribution systems.	**3**	**9**
Design considerations for distribution substation.	**2**	**6**
power-loss, voltage drop, and Voltage regulation calculations.	**2**	**6**
Power factor improvement.	**2**	**6**
Electric installation and standards.	**1**	**3**
Practical application examples using ETAP	**1**	**3**
Total	**14**	**42**

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the different components in distribution system.	Traditional Lecture	MTE, FE, Assignments
1.2	Describe the different types of loads and its characteristics.	Traditional Lecture	MTE, FE, Assignments

1.3	Recognize the different standards: National and International.	Traditional Lecture	MTE, FE, Assignments
2.0	**Cognitive Skills**		
2.1	Calculation and determination of loads and its characteristics.	Traditional Lecture	MTE, FE, Assignments
2.2	Design of primary, secondary distribution systems and distribution substation.	Traditional Lecture	MTE, FE, Assignments
2.3	Determine power loss, voltage drop and voltage regulation.	Traditional Lecture	MTE, FE, Assignments
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate the importance of and engage in Life-long learning.	Term Paper	Term paper report
3.2	conduct professionally and responsibly.	Classroom participation	Discussions
4.0	**Communication, Information Technology, Numerical**		
4.1	Communication; written and oral	Term paper	Written and presentation

5. Assessment Task Schedule for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	**Week Due**	**Proportion of Total Assessment**
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	8	20%
3	TERM PAPER	12	20%
4	FINAL EXAM	16	50%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

1. List Required Textbooks

T. Gonen, Electric Power Distribution System Engineering, Second Edition, CRC press, 2007

2. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

2. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

IEEE and IEC and NEC standards for distribution systems

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty. Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Dr. Mohamed Sayed Rizq

Signature: _____ Date Completed: 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Distribution System Planning**

Course Code: **802502**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **Distribution System Planning (802502)**			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : **TBD**			
5. Level/year at which this course is offered: **Level 01**			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any): **No**			
8. Location if not on main campus**: N/A**			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	
Comments:			

B. Objectives

1. The main objective of this course

The main intent of this course is to discuss the techniques, models, and applications related to distribution systems planning. The concepts of load forecasting, automation and control, and demand-side management are considered.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

N/A at this time.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours

Introduction to distribution system planning (definition, objectives, and main factors considered)	2	6
Load forecasting and applications	3	9
Distribution system planning techniques and models	4	12
Distribution system automation and control	2	6
Demand-side management (DSM)	3	9
Total	14	42

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the main concept of planning in distribution systems	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
1.2	Describe the main techniques and models used in distribution system planning as well as automation and control	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
1.3	Define the demand-side management	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
2.0	**Cognitive Skills**		
2.1	Estimate the forecast load growth over a future time period	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
2.2	Explain the benefits of automation and control in distribution system	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**

2.3	Compare the different types of demand-side management measures	Traditional Lecture	**Quizzes, Mid-tern Exam, Project, and Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work effectively in groups and exercise leadership	Discussions in groups at a proficient level	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written form	Discussions in groups at a proficient level	**Presentations and Reports**

5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	QUIZZES	Weekly	10%
2	MID-TERM EXAM	9	20%
3	TERM PROJECT	13	20%
4	FINAL EXAM	16	50%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

3. List Required Textbooks

- T. Gonen, *Electric Power Distribution System Engineering*, 2nd ed. Boca Ratona, FL: CRC Press, 2008.
- H. L. Willis, *Power Distribution Planning Reference Book,* 2nd ed. CRC Press, 2004.

2. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

ETAP Grid™ Distribution software

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Hani Aldhubaib

Signature: _____ Date Completed: 25 October 2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Electric Power Quality**

Course Code: **802503**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **Electric Power Quality (802503)**			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : TBD			
5. Level/year at which this course is offered: **Level 1**			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: **N/A**			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	
Comments:			

B Objectives

1. The main objective of this course

This course is designed to give the engineers full details about the power Quality problems and their effect on the load/system equipment. The definitions, Limitations according to the international standards. Various kinds of PQ problems (harmonics, Swells, flikers,….) . Mitigation strategies such as filters, static VAR compensation. Modeling and simulation of different utility systems.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

None

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
PQ definitions, limitations, related international standards	2	6
Mathematical techniques for PQ analysis of power systems	3	9
Various kinds of PQ problems and their effect on the load/system equipment	3	9
Mitigation strategies such as passive filtering, active and hybrid power filtering, static VAR compensation, DVR, UPQC, etc.	3	9
Modeling and simulation of different utility systems using ETAP	3	9
Total	**14**	**42**

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the mathematical techniques for PQ analysis of power systems	**Traditional Lectures at a proficient level and *ETAP* Presentations at an advanced level**	**HW Assignments, Mid-tern Exam, Final Exam**
1.2	Recognize the various kinds of PQ problems and their effect on the load/system equipment	**Traditional Lectures at a proficient level and *ETAP* Presentations at an advanced level**	**HW Assignments, Mid-tern Exam, Final**

			Exam
2.0	**Cognitive Skills**		
2.1	Evaluate mitigation strategies such as passive filtering, active and hybrid power filtering, static VAR compensation, DVR, UPQC, etc.	**Traditional Lectures at a proficient level and *ETAP* Presentations at an advanced level**	**HW Assignments, Mid-Term Exam, Final Exam**
2.2	Create the model and simulate of different utility systems.	**Traditional Lectures at a proficient level and *ETAP* Presentations at an advanced level**	**HW Assignments, Mid-Term Exam, Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	**Meet deadlines and work effectively in a research group.**	**Discussions in groups at a proficient level**	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	**Present research project and write a technical report**	**Independent research at a proficient level**	**Presentation of Research Project.**

5. Assessment Task Schedule for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	**Week Due**	**Proportion of Total Assessment**
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	10	20%
3	TERM PROJECT	12	20%
4	FINAL EXAM	16	50%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

5. List Required Textbooks

A.M. Muñoz "Power Quality: Mitigation Technologies in a Distributed Environment", Springer, London, 2010

2. List Essential References Materials (Journals, Reports, etc.)

1. Kusko and M.T. Thompson, "Power Quality in Electrical Systems", McGraw Hill, 2007.
2. R.M. Strzelecki, "Power Electronics in Smart Electrical Energy Networks", Springer, 2010.

3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. **Instructor's lecture notes and slides available on the Instructor's website**
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. **ETAP education version**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty. Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Prof. Dr. Mohamed Adel Mahmoud

Signature: _____ Date Completed : 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Sustainable Distributed Generation**

Course Code: **802504**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **Sustainable Distributed Generation. (802504)**			
2. Credit hours: **3**			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : **TBD**			
5. Level/year at which this course is offered: **Level 1**			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: **N/A**			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	
Comments:			

B Objectives

1. The main objective of this course

Provides a good understanding of different distributed generation technologies. Train distribution engineers on how to operate distribution networks with embedded generation. Enhance the protection aspects of distribution system with distributed generation. Introduce the state of the art techniques in distributed generation planning. Highlight the economical benefits from installing distributed generation.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

Updating the course contents according to new distributed generation technology and the latest relevant regulations and practices locally and worldwide and new researches in the field.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Introduction to Renewable Energy Source and DG	2	6
Construction, Characteristics, Modeling, and Interfacing of Common DG Energy Sources	4	12
Distribution System Planning with DG	3	9
Operational Issues of DG	4	12
Economics of DG	3	9
Total	14	42

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the drivers for distributed generation, definitions, key types, and interface connections.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
1.2	Describe the operation part includes technical impacts of distributed generation installation, reliability issues and required protective schemes, power quality issues, operation of flexible distributed generation.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
1.3	Recognize and define different planning strategies and economical impacts of distributed	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**

	generation installation.		
2.0	**Cognitive Skills**		
2.1	Evaluate operational issues for different types of DGs.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.2	Estimate and plan DG units' capacity, and requirement to serve a certain load.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.3	Evaluate economical impacts of distributed generation installation.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	**Meet deadlines and work effectively in a research group**	**Discussions in groups at a proficient level**	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	**Present research project and write a technical report**	**Discussions in groups at a proficient level**	**Presentations and Reports**

5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	10	20%
3	TERM PROJECT	12	10%
4	FINAL EXAM	16	60%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

6. List Required Textbooks
   - H. Lee Willis, and Walter G. Scott "Distributed Power Generation: Planning and Evaluation (Power Engineering, 10 ,"(Marcel Dekker (January, 2000).
   - Anne-Marie Borbely, and Jan F. Kreider, "Distributed Generation", CRC Press, 2001, ISBN 0-8493-0074-6
   - Nick Jenkins, Ron Allan, Peter Crossley, Daniel Kirschen, and Goran Strbac, "Embedded Generation", IEE Press, 2000, ISBN 0-85296-774-8

2. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

7. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website
8. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Renewable Portfolio Standard (RPS), Renewable Electricity Standard (RES), IEEE Standards 1159-Power Quality, IEEE standards 519, IEEE standards 929-2000-Islanding. - IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems, ANSI/IEEE Standard 242-2001,2001 - IEEE Recommended Practice for Calculating Short-Circuit Currents in Industrial and Commercial Power Systems, IEEE Standard 551-2006. - IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems, IEEE Standard 929-2000 - IEEE Standards for Interconnecting Distributed Resources with Electric Power Systems , IEEE Standard 1547-2003. - IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems, IEEE Std 1547.1-2005.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**

4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Dr. Abdullah bin Humaid

Signature: _____ Date Completed : 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Distribution System Reliability**

Course Code: **802505**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **RELIABILITY EVALUATION OF DISTRIBUTION SYSTEMS** (802505)			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : TBD			
5. Level/year at which this course is offered: Level 2			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any): No			
8. Location if not on main campus: N/A			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	

B Objectives

1. The main objective of this course
The intent of this course is to discuss the models, methods, and applications of reliability engineering generally in electric power systems and particularly in distribution systems.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)
N/A at this time.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Introduction to reliability engineering (definition and main concepts)	1	3

Network modeling and evaluation for simple and complex engineering systems	2	6
Generating capacity – basic probability methods	2	6
Distribution systems – main indices and basic techniques	2	6
Radial distribution networks	2	6
Parallel and meshed distribution networks	3	9
Reliability cost-worth evaluation for distribution systems	2	6
Total	14	42

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the meaning of reliability in engineering systems	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
1.2	Recognize the evaluation techniques used in power system reliability studies	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
1.3	List the reliability indices used to measure the reliability performance of distribution system	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
2.0	**Cognitive Skills**		
2.1	Evaluate primary reliability indices of engineering system components	Traditional Lecture	**Quizzes, Mid-tern Exam, Final**

			Exam
2.2	Assess the adequacy of generation systems	Traditional Lecture	**Quizzes, Mid-tern Exam, Final Exam**
2.3	Evaluate the main reliability distribution indices	Traditional Lecture	**Quizzes, Mid-tern Exam, Project, and Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work effectively in groups and exercise leadership	**Discussions in groups at a proficient level**	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	Communicate effectively in oral and written form	**Discussions in groups at a proficient level**	**Presentations and Reports**

5. Assessment Task Schedule for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	**Week Due**	**Proportion of Total Assessment**
1	QUIZZES	Weekly	10%
2	MID-TERM EXAM	9	20%
3	TERM PROJECT	13	20%
4	FINAL EXAM	16	50%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

9. List Required Textbooks

- Billinton and R. Allan, *Reliability Evaluation of Engineering Systems: Concepts and Techniques*, 2nd ed. New York: Plenum Press, 1992.
- R. Billinton and R. Allan, *Reliability Evaluation of Power Systems*. New York: Plenum Press, 1996.
- W. Li, *Risk Assessment of Power Systems: Models, Methods, and Applications*. Wiley-IEEE Press, 2005
- Chowdhury and D. Koval, *Power Distribution System Reliability: Practical Methods and Applications*. Wiley-IEEE Press, 2009.
- R. E. Brown, *Electric Power Distribution Reliability*, 2nd ed. Boca Raton, F.L: CRC Press, 2008

10. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

11. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website

12. Other learning material such as computer-based programs/CD, professional standards

or regulations and software. **Palisade software package is recommended**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Hani Aldhubaib

Signature: _____ Date Completed: 25 October 2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Electric Safety and Grounding Systems Design**

Course Code: **802506**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **Electric Safety and Grounding System Design (802506)**		
2. Credit hours: 3		
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)		
4. Name of faculty member responsible for the course **: TBD**		
5. Level/year at which this course is offered: **Level 2**		
6. Pre-requisites for this course (if any):		
7. Co-requisites for this course (if any): **Department Consent**		
8. Location if not on main campus: **N/A**		
9. Mode of Instruction (mark all that apply):		
a. Traditional classroom	√ percentage?	100
b. Blended (traditional and online)	percentage?	
c. E-learning	percentage?	
d. Correspondence	percentage?	
f. Other	percentage?	

B Objectives

1. The main objective of this course

This course is intended to cover the grounding of power systems and its effect of the system performance. The course, also cover the types of protective grounding. The course discusses the safety management and organizational structure and the human factor that affect electric safety

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

Some testing experiments in the lab.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Grounding of power systems	2	6

Protective Grounding	3	9
Distribution systems grounding	2	9
Safety issues for low, medium and high voltage systems	2	9
Designing a reliable grounding system	3	9
safety management and organizational structure and the human factor that affect electric safety.	2	6
Design examples using ETAP	2	6
Total	14	42

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the Grounding of power distribution systems	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
1.2	Describe the Safety Protective Grounding.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
1.3	Describe systems grounding and Safety issues for low, medium and high voltage systems	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.0	**Cognitive Skills**		

2.1	Evaluate Safety issues for low, medium and high voltage systems.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.2	Estimate Safety Risk management and organizational structure.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.3	Designing a reliable grounding system	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	**Meet deadlines and work effectively in a research group**	**Discussions in groups at a proficient level**	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	**Present research project and write a technical report**	**Discussions in groups at a proficient level**	**Presentations and Reports**

5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	10	20%
3	TERM PROJECT	12	10%
4	FINAL EXAM	16	60%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

1. List Required Textbooks

   Gouda, "Optimum Design of Grounding System of High Voltage Substations: Grounding System Design of High Voltage Substations", Lambert Academic Publisher, 2011.

2. List Essential References Materials (Journals, Reports, etc.)

   By the Instructor

2. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

   Instructor's lecture notes and slides available on the Instructor's website

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

   IEEE and IEC standards for Grounding systems

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Prof. Dr. Mohamed Adel Mahmoud

Signature: _____ Date Completed: 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Restructed Electricity Market**

Course Code: **802507**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **RESTRUCTED ELECTRICITY MARKETS** (802507)			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : TBD			
5. Level/year at which this course is offered: Level 2			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: N/A			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	
Comments:			

B Objectives

1. The main objective of this course

Provide a good understanding of power system economics, and Fundamentals of Electricity Markets and Energy Auctions. Provide a good understanding of different power system markets. Understand Transmission Costing and Pricing Paradigms, Transmission Pricing Practices Worldwide, Ancillary Services, and System Security in Deregulation

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

Updating the course contents according to new practices in electricity markets locally and worldwide and new researches in the field.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours

(Background Review) Traditional Power system operation and planning	2	6
Power system economics	2	6
Fundamentals of Electricity Markets and Energy Auctions	3	9
Transmission Open Access, Transmission Costing and Pricing Paradigms, and Transmission Pricing Practices Worldwide	3	9
Transmission Congestion Management and Transmission Rights	3	9
Ancillary Services and System Security in Deregulation	3	9
Total	14	42

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define and describe traditional Power system operation and planning, Power system economics, and Fundamentals of Electricity Markets and Energy Auctions	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
1.2	Describe Transmission Costing and Pricing Paradigms, Transmission Pricing Practices Worldwide.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
1.3	Describe Ancillary Services and System Security in Deregulation	Traditional Lecture	**Assignments, Mid-tern Exam, Final**

			Exam
2.0	**Cognitive Skills**		
2.1	Be able to analyze electricity markets by applying the learned tools.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.2	Be able to analyze unit commitment problems.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
2.3	Be able to analyze locational marginal price calculations and transmission costing and pricing.	Traditional Lecture	**Assignments, Mid-tern Exam, Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	**Meet deadlines and work effectively in a research group**	**Discussions in groups at a proficient level**	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	**Present research project and write a technical report**	**Discussions in groups at a proficient level**	**Presentations and Reports**

5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	10	20%
3	TERM PROJECT	12	10%
4	FINAL EXAM	16	60%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

13. List Required Textbooks

Mohammad Shahidehpour, Hatim Yamin, Zuyi Li, " Market Operations in Electric Power Systems: Forecasting, Scheduling, and Risk Management ", Wiley-IEEE press publisher, 2011.

2. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

14. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website

15. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- (US) Energy Information Administration, "The Restructuring of the electric power industry: A capsule of issues and events", 2000.
- (US) Federal Energy Regulatory Commission, "Promoting wholesale competition through open access non-discriminatory transmission services by public utilities: recovery of stranded costs by public utilities and transmitting utilities", Order No.888 ,Issued April 24, 1996.
- (US) Federal Energy Regulatory Commission, "Open access same-time information system (formerly, real-time information networks) and standards of conduct", Order No. 889, Issued April 24, 1996.
- (US) Federal Energy Regulatory Commission, "Regional transmission organizations", Order No.2000, December 1999.
- H. M. Merrill, "Regional transmission organizations: FERC Order 2000", IEEE Power Engineering Review, July 2000, pp.3-5.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching
End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**

4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Abdullah bin Humaid

Signature: _____ Date Completed: 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Distribution System Protection**

Course Code: **802508**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: ELECTRIC DISTRIBUTION SYSTEMS PROTECTION (802508)			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : TBD			
5. Level/year at which this course is offered: Level 2			
6. Pre-requisites for this course (if any):			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: N/A			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	

B Objectives

1. The main objective of this course

This course introduces topics on The Basic philosophy of protection, current and potential transformers, different protective relaying, Protection of substation and feeders, Over voltage protection, Distribution Switchgear and Protection classes – Safety and Security of installation.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

Some testing experiments in the lab.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours

Basic philosophy of distribution system protection.	**1**	**3**
Current and potential transformers.	**2**	**6**
Different protective relaying used in distribution systems.	**2**	**6**
Protection of distribution substations.	**2**	**6**
Protection of distribution feeders; OHL and cables.	**2**	**6**
Distribution Switch gear: LV and MV.	**2**	**6**
Protection classes- safety and security.	**1**	**3**
Applied examples using ETAP	**2**	**6**
Total	**14**	**42**

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define the philosophy of distribution system protection.	Traditional Lecture	MTE, FE, Assignments
1.2	Describe the different types of protective relaying.	Traditional Lecture	MTE, FE, Assignments
1.3	Recognize the different standards of CT and PT.	Traditional Lecture	MTE, FE, Assignments
2.0	**Cognitive Skills**		
2.1	Determine current rating and short circuit capacity of LV and MV CB.	Traditional Lecture	MTE, FE, Assignments

2.2	Design of the protection scheme for distribution substation.	Traditional Lecture	MTE, FE, Assignments
2.3	Design of the protection scheme for distribution feeders.	Traditional Lecture	MTE, FE, Assignments
3.0	**Interpersonal Skills & Responsibility**		
3.1	Demonstrate the importance of and engage in Life-long learning.	Term Paper	Term paper report
4.0	**Communication, Information Technology, Numerical**		
4.1	Communication; written and oral	Term paper	Written and presentation

5. Assessment Task Schedule for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	**Week Due**	**Proportion of Total Assessment**
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	8	20%
3	TERM PAPER	12	20%
4	FINAL EXAM	16	50%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

1. List Required Textbooks

Stanley H. Horowitz, Arun G. Phadke "Power System Relaying" 2nd Ed. John Wiley & Sons, Ltd, 2008.

2. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

2. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

IEEE and IEC and ANSI standards for current transformers

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours),Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Dr. Mohamed Sayed Rizq

Signature: _____ Date Completed: 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **SMART GRIDS**

Course Code: **802509**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **SMART GRIDS** (802509)			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : TBD			
5. Level/year at which this course is offered: Level 2			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: N/A			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	

B Objectives

1. The main objective of this course

To gives students a comprehensive understanding of Smart grid with the aim to modernize and fully automate the entire electricity grid covering generation, transmission, distribution, utilization plus conservation. Also, this course will provide the required knowledge required to engineers and professionals to deliver the smart grid concepts. The course will mainly focus on intelligent electricity distribution networks, present the latest technologies and analyze the impact of these technologies on system design, operation, management and maintenance, optimizing power generation and utilizing nonconventional power plants in modern power grids.

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

Updating the course contents according to new smart grid technologies and the latest relevant regulations and practices locally and worldwide and new researches in the field.

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Smart grid benefits and rules in power systems	2	6

Introduction to the technologies and policies associated with the Smart Grid	2	6
Monitoring and managing changing loads and load forecasting	2	6
Smart grid construction design, and application.	3	9
Modern power transmission and distribution networks for smart grids requirements.	3	9
Smart Meters and their Applications	2	6
Total	14	42

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define and describe the basic concepts of fundamentals, operation, design, analysis, and development of Smart Grid.	Traditional Lectures at a proficient level	**Quiz, Small Project, Midterm Exam, Final Exam**
1.2	Describe the Intelligent control/intelligent agents and grids technology used in Smart Grids in details.	Traditional Lectures at a proficient level and software programs Presentations at an advanced level	**Quiz, Small Project, Midterm Exam, Final Exam**
1.3			
2.0	**Cognitive Skills**		

2.1	Explain basic concepts of fundamentals, operation, design, analysis, and development of Smart Grid in order to study the impact, technologies, and policies associated with the Smart Grid on power system.	Traditional Lectures at a proficient level and software programs Presentations at an advanced level	**Quiz, Small Project, Midterm Exam, Final Exam**
2.2	Analyze and design load monitoring and forecasting systems of Smart Grid.	Traditional Lectures at a proficient level and software programs Presentations at an advanced level	**Quiz, Small Project, Midterm Exam, Final Exam**
3.0	**Interpersonal Skills & Responsibility**		
3.1	**Meet deadlines and work effectively in a research group**	**Discussions in groups at a proficient level**	**Presentations and Reports**
4.0	**Communication, Information Technology, Numerical**		
4.1	**Present research project and write a technical report**	**Discussions in groups at a proficient level**	**Presentations and Reports**

5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	HW ASSIGNEMENTS	Bi-Weekly	10%
2	MID-TERM EXAM	10	20%
3	TERM PROJECT	12	10%
4	FINAL EXAM	16	60%
5	TOTAL		100%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

1. Smart Grids – Fundamentals and Technologies in Electricity Networks. by Buchholz, Bernd M., Styczynski, Zbigniew
2. Smart Grid Systems Modeling and Control by N. Ramesh Babu.
3. Smart Power Distribution Systems Control, Communication, and Optimization, 1st Edition

2. List Essential References Materials (Journals, Reports, etc.)

By the Instructor

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Instructor's lecture notes and slides available on the Instructor's website

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.
- Recommendations for smart grid standardization in Europe Standards for Smart Grids,

European Standards organizations. - International Electrotechnical Commission (IEC) Standards

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **Classroom (3 Hours), Capacity = 20 Students**
2. Technology resources (AV, data show, Smart Board, software, etc.) **Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided**
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Non**

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching **End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.**
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department **1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement.** **2. Final Exam question analysis**
3. Procedures for Teaching Development **EE program Assessment Committee analyze the assessment data collected through various sources, e.g., Student Feedback surveys, Final Exam Question and close the loop by providing feedback (in the form of result of analysis) to the faculty.** **Faculty writes Improvement Plan for each course he teaches, implement this plan in the next semester and analyze the results to see the effect of improvement plan**
4. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) **Marking or grading by an independent member of teaching staff of a sample of student work will be utilized to verify the extent of Student Achievement.**
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Dr. Omar Hafiz

Signature: _____ Date Completed: 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____

Course Title: **Special Topics in power Distribution Systems**

Course Code: **802510**

1. Institution	Date
Umm Al-Qura University	**October 25, 2018**
2. College/Department	
College of Engineering and Islamic Architecture / Electrical Engineering Department	

A. Course Identification and General Information

1. Course title and code: **Special Topics in Power Distribution Systems (802510)**			
2. Credit hours: 3			
3. Program(s) in which the course is offered. **Electrical Engineering** (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course : **TBD**			
5. Level/year at which this course is offered: **Level 2**			
6. Pre-requisites for this course (if any): **Department Consent**			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: **N/A**			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	√	percentage?	100
b. Blended (traditional and online)		percentage?	
c. E-learning		percentage?	
d. Correspondence		percentage?	
f. Other		percentage?	
Comments:			

B Objectives

1. The main objective of this course

This course is intended to cover any advanced topics in electrical power distribution systems that are not included in the program and the student is interested to acquire new knowledge and current knowledge of the field

2. Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

None

C. Course Description (Note: General description in the form used in the program's bulletin or handbook)

This course deals with the most current knowledge of the field and entails solving contemporary issues and problems of the humanity using prevailing theory and techniques. The topics covered in this course will be related to the faculty teaching the course.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours

2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
Contact Hours	Planned	3					3
	Actual	3					3
Credit	Planned	3					3
	Actual	3					3

3. Individual study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

On the table below are the five NQF Learning Domains, numbered in the left column.
First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Faculty teaching the course will prepare this list.

Curriculum Map

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1			
2.0	**Cognitive Skills**		
2.1			
3.0	**Interpersonal Skills & Responsibility**		
3.1			
4.0	**Communication, Information Technology, Numerical**		
4.1			

5. Assessment Task Schedule for Students During the Semester
Faculty teaching the course will prepare this list.

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1			
2			
3			

4			
5			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

Faculty is available for 2 hours per week for regular office hours to meet with the students for consultation and advice. The students are also welcome to meet the faculty by appointment outside the regular office hours for this course.

E Learning Resources

1. List Required Textbooks

Faculty teaching the course will prepare this list.

2. List Essential References Materials (Journals, Reports, etc.)

None

2. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

None

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

None

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

Classroom (3 Hours), Capacity = 20 Students

2. Technology resources (AV, data show, Smart Board, software, etc.)

Classroom must be equipped with computer and overhead projector otherwise portable projector and laptop provided

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

Non

G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching

End of Term (semester) confidential Student Feedback surveys are collected for each course. Data is entered into CLOSO Application software data base for assessment and evaluation.

2. Other Strategies for Evaluation of Teaching by the Instructor or the Department

1. Faculty submit course folders containing graded samples of students' work, Instructor's Course Report including the cumulative grade point average (CGPA) of the course and recommendations/suggestions for improvement. **2. Final Exam question analysis**
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5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. **The results of assessment and evaluation of feedback and Final exam questions is discussed with the entire faculty (by Assessment Committee) during the Faculty Council meeting. The recommendations of faculty are documented. An action plan is made for changes after the approval of Faculty Council and sent to college council for approval and implementation**

Name of Course Instructor: Dr. Mohamed Al Alshaikh

Signature: _____ Date Completed: 25-10-2018

Program Coordinator: _____

Signature: _____ Date Received: _____