

## **COURSE Syllabus**

**Course Name: Power Systems Lab.**

**Course Number: 0408486+04025160**

### General Course Information:

Course title	Power Systems Lab.
Course number	0402486, 04025160
Credit hours (theory, practical)	1Ch. practical
Contact hours (theory, practical)	3h in one time weekly
Prerequisites/corequisites	Power Systems Analysis (0408485 & 0402485)
Academic Program	RENEWABLE ENERGY ENGINEERING
Program code	REE + EE
Awarding institution	Isra University
Faculty	Faculty of Engineering
Department	RENEWABLE ENERGY Engineering Department
Level of course	Fourth-year
Academic year /semester	
Awarded qualification	B.Sc.
Other department(s) involved in teaching the course	Communications and Electronics Engineering Department
Language of instruction	English & Arabic
Date of production/revision	

### Course Coordinator:

Office No.: 40211

Office Hours: Mon: 12:00 – 13:00

Email: [zakaria.alomari@iu.edu.jo](mailto:zakaria.alomari@iu.edu.jo)

### Other Instructors:

Office No.:

Email:

Office Hours:

### Course Description:

Performance of Transmission line at no-load, Performance of Transmission line at full load, Matched load performance characteristics, Capacitive load, performance characteristics of an ohmic-capacitive and pure capacitive load, performance characteristics of an ohmic-inductive and pure inductive.

### Text Book: *Author(s), Title, Publisher, Edition, Year, Book website.*

1. Laboratory Manual.

### References: *Author(s), Title, Publisher, Edition, Year, Book website.*

Required book (s), assigned reading and audio-visuals:

1. John J. Grainger, William D. Stevenson, "Power System Analysis" 1994. Mc Graw-Hill.

### Course Educational Objectives (CEO):

1.	Relate the theoretical knowledge gained from his study of power systems analysis course to the practical application in the lab.
2.	Acquitted with power devices and instruments and appreciate difference between ideal and practical.
3.	Compare results calculated theoretically with that obtained from measurements.

### Intended Learning Outcomes (ILOs):

	Intended Learning Outcomes ILOs)	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
A	<b>Knowledge and Understanding:</b>				
A1	Determine the A, B, C & D constants of a short, medium, and long transmission.	1, 2, 3	1, 5	1, 2	K
A2	understanding the relationship between Reactive power and voltage regulation.	1, 2, 3	1, 5	1,2	K
B	<b>Intellectual skills:</b>				

B1	Verify that the measurements are predictable from the theory.	1, 2, 3	1, 5	3	S
B2	Analyze the efficiency and characteristics of different TL models.	1, 2, 3	1, 5	4	S
C	Subject-specific skills:				
C1	Ability to work with measurement units in the lab.	1, 2, 3	1, 5	5, 6	S

**\*Bloom Taxonomy Levels**

1. Level #	1	2	3	4	5	6
2. Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**\*\*Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.**

**Topic Outline and Schedule:**

Topic	Weeks	Achieved ILOs	Evaluation Methods	Reference
Introduction	1 <sup>st</sup> & 2 <sup>nd</sup> weeks	2		
Exp. 1	3 <sup>rd</sup> week	1+2+3		Laboratory Manual
Exp. 2	4 <sup>th</sup> week	1+2+3		Laboratory Manual
Exp. 3	5 <sup>th</sup>	1+2+3		Laboratory Manual
Exp. 4	6 <sup>th</sup> week	1+2+3		Laboratory Manual
Open Lab.	7 <sup>th</sup>			Laboratory Manual
Midterm Exam	8 <sup>th</sup>	1+2+3		Laboratory Manual
Exp. 5	9 <sup>th</sup> week	1+2+3		Laboratory Manual
Exp. 6	10 <sup>th</sup> week	1+2+3		Laboratory Manual
Exp. 7	11 <sup>th</sup> week	2+4		Laboratory Manual
Exp. 8	12 <sup>th</sup> week	2+4		Laboratory Manual
<b>Open Lab.</b>	13 <sup>th</sup> week	all		Laboratory Manual
<b>Final exam</b>	14 <sup>th</sup> week	all		

### Teaching Methods and Assignments:

The development of ILOs is promoted through the following teaching and learning methods: Lectures Lab hands-on Lab hands-on & online	
<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face-to-face
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	<b>Use of ICT teaching for notes, references, and communication with students.</b>
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, Quizzes, laboratory practice, fieldwork, YouTube videos, study and analysis of bibliography, tutorials, art workshops, interactive teaching, educational visits, project, essay writing, etc.</i>	• Classroom quizzes and exams
	• Projects
	• Poster presentations of library or laboratory research or videos
	• Standardized tests both within and across disciplines
	• Questionnaires
	• Interviews

### Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

#### Attendance

Students should attend every class meeting for the entire course period. If you miss class, it is your responsibility to obtain announcements and assignments.

How to success – *Active sharing and cooperation, on time, prepared.*

#### Grading Policy:

<b>1. Midterm</b>	<b>30%</b>
<b>2. Assignments and technical reports</b>	<b>20%</b>
<b>3. Final Examination</b>	<b>50%</b>

#### Academic Assistance

- Homework is due to the beginning of class on the due date.
- At least one project during the term.
- Any potential conflicts have to be discussed before the exam dates.
- Quizzes in-class will be given and there will be no make-up quizzes.
- Final Exam (50%).

- Copying of assignments or other means of duplicating materials that is turned for grading is **forbidden**.
- Cheating on exams will result in a zero grade for the exam or the whole course.

At any point in the semester, if you encounter difficulty with the course or feel you could be performing at a higher level, consult with me.

**Academic support for Students with Disabilities – Students who may need assistance due to a disability are encouraged to ask for a support.**

### Course Policies:

A- Attendance policies:

15% of 48 lecturing hours

B- Absences from exams and handing in assignments on time:

Exam can retake based on approval of excuse from dean

Not handing assignment on time will result in zero mark

C- Health and safety procedures: NA

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Cheating, plagiarism, misbehavior may result in zero grade

E- Grading policy:

- All homeworks are posted on line
- All quizzes and exams are provided with solution for perfect score

F- Available university services that support achievement in the course: Labs, Software, Simulation programs

### Required equipment:

**Labs: None**

**Software:**

**Hardware: Later on.**

### Assessment Plan for the Course Learning Outcome (just select):

- Midterm Online Exam.
- Final Online Exam.
- Quizzes.
- Written Reports.
- Homework.
- Term Projects.
- Case Study.
- Participation in Lecture.
- Illustrative Presentations.
- Oral Exams.
- Others (identify): Active attendance and on-time.

### Program Learning Outcome (PLOs):

<b>Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program. A graduate of the () program will demonstrate.</b>	
1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3.	An ability to communicate effectively with a range of audiences
4.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

### Responsible Persons and their Signatures:

<b>Course Coordinator</b>	<b>Dr. Zakaria Al-Omari</b>	<b>Completed Date</b>	
		<b>Signature</b>	
<b>Received by (Department Head)</b>	<b>Dr. Zakaria Al-Omari</b>	<b>Received Date</b>	
		<b>Signature</b>	