



Faculty: Engineering Faculty	
Department: Energy	Program: Face to Face
Semester: 1st	Academic year: 2024-2025

Course Plan

First: Course Information

Course Name:		<i>Energy engineering software</i>	Credit Hours: 1hour
Prerequisite:.....		Class Number: 0906303	Lecture Time: 09:30- 11:00 Mon , Wed
Course Nature:	Mandatory Faculty Requirement ☐ Optional University Requirement ☐ Mandatory University Requirement ☐ Faculty Requirement ☐ Ancillary Course ☐ Optional Specialty Requirement ☐ Mandatory Specialization requirement ☒		
Type of Education:	Fully Face-to-Face Education (fully Direct) ☐ Integrated Education (1Face-to-Face + 1 Asynchronous) ☒ Fully Electronic Education (2 Synchronous + 1 Asynchronous) ☐		

Second: Instructor's Information

Name: Dr. Mais Alzgool		Academic Rank: Assistant Professor		
Office Number: L136		Ext. Number: 2039	E-mail: malzgool@zu.edu.jo	
Office Hours:	Sunday 11-12	Monday 12-1	Tuesday 11-12	Wednesday 12-1
				Thursday 11-12

Third: Course Description

This course covers the main functions of different electrical, electronic, and energy systems using PSCAD software. This includes the main PSCAD functions and how to apply the special topics in electrical and energy engineering with the aid of PSCAD. The simulations and tests will be covered for single phase\ three-phase systems, fault analysis, PV array simulation, and MPPT implementation. In addition the understanding and the use of PVsyst tool to design a practical PV system will be included.

Fourth: Learning Source

Main Reference:	<i>PSCAD Users Guide V4_6_0. A Quiet Revolution in Simulation.</i> <i>PVsyst software</i>	
	Issue No.:	Publication Year:V4
Additional Sources Websites:		
Teaching Type:	☐ Classroom ☒ Laboratory ☐ Workshop MS ☐ Teams Moodle ☒	

Fifth: Learning Outcomes

Course Code	CourseIntended Learning Outcomes (CILOs)	Connection To Program ILOs Code
Knowledge		
**K1	Identify the importance of PSCAD platform in energy engineering applications	*PK1
K2	Explain the use of the basic functions and models in PSCAD	PK2
K3	Implement the functions and models using PSCAD	PK3
Skills		
***S1	Analyze the PV array system with the control model of MPPT using PSCAD.	PS1
S2	Simulate the electronics and electrical models using PSCAD.	PS2
S3	Design a model within a team of any practical electrical and electronics systems to analyze the results	PS3
Competencies		
****C1	Apply the required software in designing a residential PV system using PSCAD and PVsyst platforms.	

* P: Program, **K: knowledge, ***S: skills, ****C: competencies.

Sixth: Course Structure

Lecture Date	Teaching Outcome	Topics	Teaching Procedures*	Teaching Methods***	References***
14/10/2024	A1	Starting PSCAD and Introduce some common models found in the PSCAD master library	Face-to-Face	PSCAD Software	All Material
16/10/2024	A2,B1, B3	Starting PSCAD and Introduce some common models found in the PSCAD master library	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
21/10/2024	A2, B1, B3	Starting PSCAD and Introduce some common models found in the PSCAD master library	Face-to-Face	PSCAD Software	Main Reference
23/10/2024	A2, B1, B3	Simulation of DC-DC converter	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
28/10/2024	A2, B1, B2, C2	Simulation of DC-DC converter	Face-to-Face	PSCAD Software	Main Reference
30/10/2024		Simulation of DC-DC converter	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
4/11/2024	A2, B1, B2, C2	Build a simple power system network with a 3-phase source	Face-to-Face	PSCAD Software	Main Reference
6/11/2024	A2, B1, B2, C2	Build a simple power system network with a 3-phase source	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
11/11/2024	A2, B2, B3, C2	Build a simple power system network with a 3-phase source	Face-to-Face	PSCAD Software	Main Reference

13/11/2024	A1	Simulate a full bridge inverter	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
18/11/2024	A2,B1, B3	Simulate a full bridge inverter	Face-to-Face	PSCAD Software	Main Reference
14/11/2024	A2, B1, B3	Simulate a full bridge inverter	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
20/11/2024	A2, B1, B3	Design a PV system and analyze the output DC voltage and current	Face-to-Face	PSCAD Software	Main Reference
25/11/2024	A2, B1, B2, C2	Design a PV system and analyze the output DC voltage and current	-----	-----	-----
27/11/2024	A1	Design a PV system and analyze the output DC voltage and current	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
2/12/2024	A2,B1, B3	Design and simulate a PV system and study the effect of the temperature\ Irradiation on the I-V curve	-----	-----	-----
4/12/2024	A1	Design and simulate a PV system and study the effect of the temperature\ Irradiation on the I-V curve	-----	-----	-----
9/12/2024	A2,B1, B3	Design and simulate a PV system and study the effect of the temperature\ Irradiation on the I-V curve	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
11/12/2024	A2, B1, B3	Design a PV array connected with MPPT	Face-to-Face	PSCAD Software	Main Reference

14/12/2024	A2, B1, B3	Design a PV array connected with MPPT	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
18/12/2024	A2, B1, B2, C2	Design a PV array connected with MPPT	Face-to-Face	PSCAD Software	Main Reference
23/12/2024	,B1, B32A	Three phase Inverter (DC-AC)	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
25/12/2024	عطلة عيد الميلاد	Three phase Inverter (DC-AC)	Face-to-Face	PSCAD Software	Main Reference
30/12/2024	, B1, B2, C22A	Transformers	Asynchronous	Assignment\ simulation using PSCAD and the result will be discussed in the class room	Main Reference
1/1/2025	عطلة راس السنة الميلادية	Design a power system with Autotransformer	Face-to-Face	PSCAD Software	Main Reference
4/1/2025	A1	Design a power system with Autotransformer	-----	-----	-----
8/1/2025	A2,B1, B3	Design a residential PV system using a PVsyst	Face-to-Face	PVsystSoftware	Main Reference
13/1/2025	A1	Design a residential PV system using a PVsyst	Asynchronous	Assignment\ simulation using PVsyst and the result will be discussed in the class room	Main Reference
15/1/2025	A2,B1, B3	Design a residential PV system using a PVsyst	Face-to-Face	PVsystSoftware	Main Reference

* Learning procedures: (Face-to-Face, synchronous, and asynchronous). ** Teaching methods: (Lecture, video.....). *** Reference: (Pages of the book, recorded lecture, video....).

Seventh: Assessment methods

Methods	Online Learning	Blended Learning	Direct Teaching	Material Output to be measured
Mid exam	----	----	30%	K-K
Activities	----	20%	----	S-S
Final Exam	----	----	50%	All CIOs

Eighth: Course Policies

- All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:
 - a. Punctuality.
 - b. Participation and interaction.
 - c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

Approved by:	Name	Date	Signature
Head of Department	Dr. AymanAmer	21/11/2024	
Faculty Dean	Prof. TaiseerAlghanim	21/11/2024	