Faculty: Engineering Technology	
Department: Energy	**Program: Bachelor Degree**
Academic year:2025 - 2024	**Semester: 1^{st} (Fall)**

Course Plan

First: Course Information

Course No. 0906454	***Course Title:* Wind Energy**	***Credit Hours:3***
Prerequisite: 0906353+0904364	***Section No.: 1***	***Lecture Time:* 11-10,*Sun,Tue,and Thu***
Type Of Course:	☐ ***Obligatory Faculty Requirement Elective*** ☐ ***University Requirement*** ☐ ***ObligatoryUniversity Requirement*** ☐ ***FacultyRequirement*** ☐ ***Course Elective SpecialtyRequirementObligatorySpecialization requirement***	
Type of Learning:	☒ ***Face-to-Face Learning*** ☐ ***BlendedLearning(2 Face-to-Face + 1Asynchronous)*** ☐ ***Online Learning (2 Synchronous+1 Asynchronous)***	

Second: Instructor's Information

***Name:* Dr. Mais Alzgool**		***Academic Rank:* Assistant Professor**		
Office Number:136 l		***Ext. Number:2039***		***E-mail:*** maisalzgool@yahoo.com
Office Hours:	***Sunday***	***Monday***	***Tuesday***	***Wednesday***	***Thursday***
	11-12	***11-12:30***	***11-12***	***11-12:30***	***11-12***

Third: Course Description

This course aims to Introduce students to wind and wind power history, Structure of the wind turbine, Impact of tower height. Maximum rotor efficiency and wind turbine generators. Turbine aerodynamics (how wind turbine works). Average power in the wind. Wind turbine electrical capacity. Wind power probability density function, Weiball, and Rayleigh statistics. Wind farms. Specific wind turbine performance calculation. Environmental concerns: noise, view, and landscape.

Fourth: Learning Source

Main Reference:	**"Handbook on solar wind: effects, dynamics and interactions"**	
Author: **HANS E. JOHANNSON**	***Issue No.:***	***Publication Year:*** **2009**
Additional Sources&Websites:	• •	
Teaching Type:	☒ ***Classroom*** ☐ ***Laboratory*** ☐ ***Workshop*** ☐ ***MS Teams*** ☐ ***Moodle***	

Fifth: Learning Outcomes

Course Code	***Course IntendedLearning Outcomes (CILOs)***	***Connection To Program ILOs Code***
Knowledge		
**K1	**Thorough** understanding of the fundamentals of the wind, wind turbine, and the main components of the wind turbine	*PK1
K2	**Explain** the wind turbine aerodynamics and identify the maximum rotor's efficiency.	PK2
K3	**Calculate** the average power in the wind and the annual energy using the probability density functions; Weiball and Rayleigh statistics.	PK3
Skills		
***S1	**Analyze** the environmental impacts of wind energy such as; emissions, noise and visual impact	PS1
S2	**Practice** the calculation of the sound power level of wind turbines within the wind farms	PS2
Competencies		
****C1	**Apply** the design criteria of the wind farms and determine the annual energy production of the wind farms.	PC1

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

Sixth: Course Structure

Lecture Date	Intended Teaching Outcomes(ILOs)	Topics	Teaching Procedures*	TeachingMethods***	References***
13/10/2024	A1	Introduction to Wind & Wind Power History	General discussions	Discussion and problem Solving	Energy Engineering
15/10/2024	A1, A2	Introduction to Wind & Wind Power History	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
17/10/2024	A2	Introduction to Wind & Wind Power History	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
20/10/2024	A1, A2	Wind Turbine Mechanism and its main Components	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
22/10/2024	A1, A2	Wind Turbine Mechanism and its main Components	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
24/10/2024	A2, B1	Wind Turbine Mechanism and its main Components	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
27/10/2024	A2, B1	Wind Turbine Mechanism and its main Components	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
29/10/2024	A1, A2, B1	Wind Turbine Mechanism and its main Components	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
31/10/2024	B1, C1	Wind Turbine Mechanism and its main Components	General discussions	Discussion and problem Solving	Energy Engineering
3/11/2024	A2	Power in the wind	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
5/11/2024	A2	Power in the wind	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
7/11/2024	B1 C1	Power in the wind	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
10/11/2024	B2, C1	Wind Turbine Generators	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
12/11/2024	B3, C1	Wind Turbine Generators	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
14/11/2024	B1 C1	Wind Turbine Generators	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
17/11/2024	B2, C1	Discrete Wind Histogram	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
19/11/2024	A1, A2	Discrete Wind Histogram	General discussions	Discussion and problem Solving	Energy Engineering
21/11/2024	A1, A2	Discrete Wind Histogram	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering

24/11/2024	A1, A2	Wind Power Probability Density Functions	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
26/11/2024	B3, C1	Wind Power Probability Density Functions	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
28/11/2024	B1 C1	Wind Power Probability Density Functions	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
1/12/2024	B1 C1	Wind Farms	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
3/12/2024	B2, C1	Wind Farms	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
5/12/2024	B3, C1	Wind Farms	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
8/12/2024	B1 C1	Specific Wind Turbine Performance Calculations	General discussions	Discussion and problem Solving	Energy Engineering
10/12/2024	A1, A2	Specific Wind Turbine Performance Calculations	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
12/12/2024	A1, A2	Specific Wind Turbine Performance Calculations	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
15/12/2024	A1, A2	Wind Turbine Aerodynamics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
17/12/2024	A2, B1	Wind Turbine Aerodynamics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
19/12/2024	A2, B1	Wind Turbine Aerodynamics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
22/12/2024	A2, B1	Optimizing Rotor Diameter and Generator Rated Power	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
24/12/2024	A2, B1	Optimizing Rotor Diameter and Generator Rated Power	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
26/12/2024	A2, B1	Optimizing Rotor Diameter and Generator Rated Power	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
29/12/2024	A2, B1	Using Real Power Curves with Weibull Statistics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
31/12/2024	A2, B1	Using Real Power Curves with Weibull Statistics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
2/1/2025	A2, B1	Using Real Power Curves with Weibull Statistics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering

5/1/2025	A2, B1	Environmental impacts of wind turbine; emissions, noise and visual impact.	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
7/1/2025	A2, B1	Environmental impacts of wind turbine; emissions, noise and visual impact.	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
9/1/2025	A2, B1	Environmental impacts of wind turbine; emissions, noise and visual impact.	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
12/1/2025	A2, B1	Calculation of the sound level of the wind farm and to evaluate the wind farms' noise.	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
14/1/2025	A2, B1	Calculation of the sound level of the wind farm and to evaluate the wind farms' noise.	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
16/1/2025	A2, B1	Calculation of the sound level of the wind farm and to evaluate the wind farms' noise.	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering

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

Seventh: Assessment methods

Methods	Grade	Date	Platform	CLO'S
First Exam	20	Fixed by the Department	Classroom	K،K
Second Exam	20	Fixed by the Department	Classroom	S،S
Assign, Quizzes &Participation	10	During Semester	Classroom+Moodle	All CLO'S
Final Exam	50	Fixed by the Department	Classroom	All CLO'S

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. Ayman Amer	2024/11/20	
Faculty Dean	Prof .Taiseer Alghanim	2024/11/20	