Faculty: Engineering Technology	
Department: Energy	**Program: Bachelor Degree**
Academic year: 2022-2023	**Semester: 2^{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: 12-1,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

Introduction to wind and wind power history. Structure of the wind turbine. Impact of tower height. Maximum rotor efficiency. Introduction to wind turbine generators. Turbine aerodynamics (how wind power 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	Understand the impact of tower height	*PK1
K2	Define the maximum rotor efficiency.	PK2
K3	Explain the wind turbine aerodynamics.	PK3
Skills		
***S1	Define the wind and the power in the wind. Understand the structure of the wind turbine and its conversion principle.	PS1
S2	Understand the impact of tower height on the output power. And defining the maximum rotor efficiency of the wind turbine.	PS2
S3	Analyze the average power in the wind and the wind turbine electrical capacity. Calculate the wind power probability density functions, using Weiball and Rayleigh statistics.	PS3
S4	Understand the concept of wind farms and its environmental impact.	PS4
S5	Specific wind turbine performance calculation.	PS5
Competencies		
****C1	Explain the fundamentals of wind and wind power.	PC1
C2	Determine the Structure of the wind turbine	PC2

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

Sixth: Course Structure

Lecture Date	Intended Teaching Outcomes(ILOs)	Topics	Teaching Procedures*	TeachingMethods***	References***
5/3/2023	0	Introduction to Wind & Wind Power History	General discussions	Discussion and problem Solving	Energy Engineering
7/3/2023	1	measuring system	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
9/3/2023	1	Introduction to Wind & Wind Power History	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
12/3/2023	1	measuring system	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
14/3/2023	2	Introduction to Wind & Wind Power History	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
16/3/2023	1 & 2	measuring system	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
19/3/2023	3	Introduction to Wind & Wind Power History	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
21/3/2023	3	measuring system	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
23/3/2023	3	Introduction to Wind & Wind Power History	General discussions	Discussion and problem Solving	Energy Engineering
26/3/2023	3	measuring system	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
28/3/2023	3	Introduction to Wind & Wind Power History	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
30/3/2023	4	measuring system	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
2/4/2023	3 & 4	Wind Turbine	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
4/4/2023	3 & 4	Mechanism and its main	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
6/4/2023	4	Components	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
9/4/2023	5	Wind Turbine	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
11/4/2023	5	Mechanism and its main	General discussions	Discussion and problem Solving	Energy Engineering
13/4/2023	5	Components	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
16/4/2023	5	Wind Turbine	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
18/4/2023	5	Mechanism and its main	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
20/4/2023	4	Components	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
27/4/2023	3 & 4	Wind Turbine	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
30/4/2023	6	Mechanism and its main	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering

2/5/2023	4	Power in the wind calculations and the	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
4/5/2023	3 & 4	Combined Temperature and Altitude Corrections for Air Density	General discussions	Discussion and problem Solving	Energy Engineering
7/5/2023	3 & 4	Power in the wind calculations and the	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
9/5/2023	4	Impact of Tower Height. And the Maximum Rotor Efficiency	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
11/5/2023	6	Impact of Tower Height. And the Maximum Rotor Efficiency	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
14/5/2023	4	Calculation of the average Power in the Wind Using the Discrete Wind Histogram	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
16/5/2023	6	Calculation of the average Power in the Wind Using the Discrete Wind Histogram	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
18/5/2023	4	Wind Power Probability Density Functions	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
21/5/2023	7	Wind Power Probability Density Functions	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
23/5/2023	8 , 9 , 10	Average Power in the Wind with Rayleigh Statistics	General discussions	Discussion and problem Solving	Energy Engineering
28/5/2023	8 , 9 , 10	Average Power in the Wind with Rayleigh Statistics	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
30/5/2023	8 , 9 , 10	Specific Wind Turbine Performance Calculations	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering

1/6/2023	8 , 9 , 10	Specific Wind Turbine Performance Calculations	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering
4/6/2023	10	Idealized Wind Turbine Power Curve	At least one exam will be held suddenly during the semester	Discussion and problem Solving	Energy Engineering
6/6/2023	10	And Wind Speed Cumulative Distribution Function	Review the previous lecture, then explain the current lecture	Discussion and problem Solving	Energy Engineering

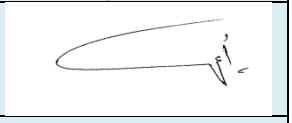
* Learning procedures: (Face-to-Face, synchronous, asynchronous). * * Teaching methods: (Lecture, video…..). ** * Reference: (Pages of the book, recorded lecture, video….).

Seventh: Assessment methods

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

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	2023/3/5	
Faculty Dean	Prof .Taiseer Alghanim	2023/3/5