Course Description

Course title	Design of Wind Turbines
Course code	ECE 433
College	Engineering
Department / Program	Electrical Engineering/ Renewable Energy
Year/ Level	5/9
Course Type	**A.** ☐ University ☐ College ☐ Department ◼ Program ☐ Others b. ☐ Required ◼ Elective
Credited Hours	3 CR
Contact Hours	(LT:2, LB:2 ,TR:0)
Pre-requisites (if any)	ECE 230
Co-requisites (if any)	---
Course description	Design of Wind Turbine is including complications of production of electricity from wind power, wind turbines locations and atmospheric science, analysis of experimental data, design and control analysis of wind turbine components, wind turbines sizing and citing analysis, adaptation of wind turbines with smart grids.

Course Main Objectives	- Identify the energy needs and associated cost of energy for a given region of the world. - Assess the wind potential of a given region. - List the impact of environmental (noise, avian) and societal factors on the selection and sizing of a wind turbine site. - Design of a turbine blade by using The Blade Element Momentum method. - Model a horizontal axis wind turbine and predict the power production as a function of wind speed. - Design wind turbines that have maximum efficiency over a range of wind speeds. - The student will demonstrate the ability to present the site selection, design, and cost analysis in oral and written form.
Learning Outcomes	**Knowledge and Understanding** Define the concepts of design wind turbines
	Skills: Apply understood concepts and laws to solve problems.
	Values: Work individually or in teams in laboratories and on research projects professionally.
References	1- Wind energy explained : theory, design and application, Manwell, James F.; McGovan, Jon G.; Rogers, Anthony L., Wiley 2- Wind Energy Handbook, Tony Burton, Nick Jenkins, David Sharpe, Ervin Bossanyi, Wiley