

List of capstone projects (111)

	Project Title	Advisor (s)	Project Description	Pre-requisites
A.	Charging of All-Electric Vehicles with All-Green Energy Using Smart Grid Technologies	Dr. Ali Al-Awami	The objective is to design a system/algorithm for charging a fleet of electric vehicles using energy generated from renewable energy sources, such as solar and wind. The design might involve the use of storage media as well.	
D.	Design and Implementation of a digitally controlled RF power meter for wireless coverage measurements	Dr. O. Hammi Dr. M. Sharawi	In this project, the students will design an RF power measurement system that will be used for wireless coverage measurement. The system will include the design of a multiband printed antenna, the system level design of the RF front end and the use of a digitally controlled RF power measurement device. The students will end up with a complete system level design that integrates both RF and digital domains. A prototype will be built using commercial circuits and experimentally validated through measurements.	Knowledge in communication systems and electromagnetics.
E.	Design and Implementation of a PID Controller for a Servo System	Dr. A. H. A- Rahim and S. Rizvi	Recent developments in power semiconductor technology and control theory have enabled modern motor drives to face challenging high efficiency and high performance requirements in the industrial sector. In this project, design and implementation of a controller that adjusts the motor speed/position is aimed. Controller design will be carried out for a laboratory DC servo system. Tasks involve identifying the model of a servo system, designing a controller for satisfactory speed/position control and implementation of the controller. The performance of controller should be tested on a laboratory servo system	Prerequisite: EE 380
F.	Design and Implementation of a Microcontroller-Based Multifunction Relay	Dr. Mohammad Abido Dr. Alaa Hussain	Overcurrent relays are the most common type of protective relays. They are being used for protecting Feeders, Motors, Generators, Transformers,...etc. Microcontrollers are being used nowadays by	Pre-requisite courses EE390 EE 466 (or currently registered)

			<p>all manufacturers for realizing such relays.</p> <p>In this project a prototype is to be implemented and tested for such relay with added functions such as Metering, negative sequence protection and overload protection.</p>	
G.	Design and implementation of a Bluetooth Controlled Digital Display.	Dr. Ali Muqaibel	<p>One of the common problems we face in our prayer rooms within our work place is the need to update the prayer iqama time frequently. It is usually done by posting papers with the prayer time. The paper must be changed frequently and by the authorized person. This lead to many problems!</p> <p>In this project the students will design and implement a digital display. Using software designed for the mobile phone (or laptop) The displayed number can be changed wirelessly using Bluetooth (or other alternative wireless technology). A password protection can be used to limit the access to the display.</p> <p>Design Content:</p> <ol style="list-style-type: none"> 1) Electronic circuits (power supply), display , decoders. 2) Use of Bluetooth transceiver chipset. 3) Microcontroller Circuit. 4) Software programming. 	It is recommended that some students have finished EE390.
H.	Design and Implementation of Efficient Codes for Multi-Input Multi-Output Wireless Communications Systems	Dr. Samir AlGhadban, Dr. Adnan AlAndalusi	<p>The project is related to the use of special signal processing techniques to improve the performance of wireless communication systems employing multiple transmit and receive antennas.</p> <p>The work will involve algorithm design and implementation (in Matlab) of various coding schemes, and will expand upon related previous work.</p>	
I.	Implementation and testing of Multi-Input Multi-Output Wireless Communication	Dr. Wajih AbuAlSaud, Dr. Adnan AlAndalusi, Eng. Noman Tasadduq	The project is related to the set-up and testing of wireless communication systems with multiple transmit and receive antennas. The work will be conducted under various propagation	

	System on a Software-Radio Platform		<p>channels conditions, to study their impact on the communication system performance.</p> <p>The work will be based on available software-radio platform design tools.</p>	
J.	Design and development of LABVIEW Based Monitoring System for PV Power Generation	<p>Dr. Chokri Belhaj Ahmed</p> <p>Dr. Ibrahim El-Amin</p>	<p>Photovoltaic (PV) power generation system in rural and urban areas is spreading all over the world. PV power is abundant, renewable, environmentally clean and free energy source. The output power from a PV module depends on environmental factors such as irradiation, cell temperature, ambient temperature, clouds, wind speed, humidity, rain and dust. The team will design and develop LABVIEW Interface to monitor the performance of PV power system variables as well as the behavior of the influential environmental parameters. The Virtual Instrument LABVIEW filters developed will be following the real experimental data obtained online from KFUPM beach site for PV generation.</p> <p>Major Tasks</p> <ul style="list-style-type: none"> • Design a plan for LABVIEW Interface modules. • Develop the monitoring modules and integrate the whole interface based on the available existing sensors. • Use the available real existing PV system data to test the monitoring system • Use the developed System to draw conclusion about the performance of the PV output. 	
K.	Design and development of LABVIEW Based Monitoring System for PV Power Generation	<p>Dr. Mahmoud Kassas</p> <p>Dr. Mohammad Abido</p>	<p>Photovoltaic (PV) power generation system in rural and urban areas is spreading all over the world. PV power is abundant, renewable, environmentally clean and free energy source. The output power from a PV module depends on environmental factors such as irradiation, cell temperature, ambient temperature, clouds, wind speed, humidity, rain and dust. The team will design and develop LABVIEW Interface to monitor the performance of PV power system variables as well as the behavior of the influential environmental parameters. The Virtual Instrument LABVIEW filters developed will</p>	

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L.	Person identification using handwritten signatures	Dr. M. Deriche Dr. M. Mohandes	Security is becoming an important area of research all over the world. In this project, the students will design and implement a system for recognizing people using their signatures. The signatures will be extracted as images from which features are extracted then classified. The project will be implemented is real time using electronic writing pads.	Student need to have a good background in MATLAB programming, EE406/410 desirable
O.	Solar Tracking and Car Battery Charging System	Dr. Z. Al-Hamouz Dr. A.H. Abdurrahim	In this project, the students will develop a battery recharging system that utilizes solar panels as a source of power. A solar tracker will be developed to orient the panel toward the sun	
P.	Estimation of the dielectric constant and conductivity of the sidewalls of the EE Building.	Dr. Essam E. Hassan Dr. Hassan Ragheb	The objective of this project is to use non destructive test to measure the relative permittivity and conductivity of the side walls of the EE Building. This is done by measuring the antenna directivity through direct power reception, then measuring the reflected field from the wall to estimate the relative permittivity. Finally, measuring the power transmitted through the wall to obtain the wall conductivity.	Requirements: EE340
R.	Solar Tracking and Car	Dr. Z. Al-Hamouz	In this project, the students will develop a battery recharging	

	Battery Charging System	Dr. A.H. Abdurrahim	system that utilizes solar panels as a source of power. A solar tracker will be developed to orient the panel toward the sun	
S.	Design and Implementation of a Microcontroller-Based Multifunction Relay	Dr. Mohammad Abido Dr. Alaa Hussain	<p>Overcurrent relays are the most common type of protective relays. They are being used for protecting Feeders, Motors, Generators, Transformers,...etc. Microcontrollers are being used nowadays by all manufacturers for realizing such relays.</p> <p>In this project a prototype is to be implemented and tested for such relay with added functions such as Metering, negative sequence protection and overload protection.</p>	Pre-requisite courses EE390 EE 466 (or currently registered)