

مشاريع التخرج للسنة الدراسية 2020-2021

الدراسة : مسائية

عنوان المشروع :

**New Approach for charging and discharging battery of
Standalone Photovoltaic "PV" Systems**

إسم المشرف: م.م احمد محسن بطي

الهدف من المشروع :

The main objective of the project is to develop a method to control the battery charging process during the day, high sunlight, excess energy, and battery discharge in the case of night and absence of the sun. By using buck-boost converter to work as "buck" when charge battery and .work as "boost" to discharging . In addition, will design a stand-alone PV system

خلاصة عن المشروع :

Photovoltaic” (PV) is working around whole world in latest years. The stand-alone PV system is“ extensively used in numerous applications in remote and isolated regions and used in a rare area to supply the converted sun power to electric power to the demand load far from the grid utility. This Project describes modeling of a standard 20 kW power of photovoltaic-battery “stand-alone PV system” (SPVS) and its configuration to achieve a stable, controllable power output and stable output DC voltage to satisfy the AC loads demand s independent on weather conditions. Also, A “Battery Energy Storage system” (BESS) is used for the SPVS. BESS composed from “power electronic” (PE) devices as a control system and batteries as storage system. Bi-directional DC into DC PE converter manages power flow among batteries and energy systems. The PID .controller is used to improve the performance of the DC voltage controller

متطلبات المشروع:

.PC

.Matlab Software last version 2021

Online Resources.

الدراسة : الصباحية

عنوان المشروع :-

Feasibility study for a photovoltaic system in University of Thi-Qar

اسم المشرف :- م.د. حيدر عبد الحسن

الهدف من المشروع :- دراسة الجدوى الاقتصادية لمنظومة كهروضوئية في قسم الهندسة المدنية - جامعة ذي قار

خلاصة عن المشروع:

يتم حساب الطاقة الكهربائية المتولدة من الطاقة الشمسية حسب الطريقة المقترحة بواسطة الخلايا الكهروضوئية التي يتم تنصيبها على سطح بناية الهندسة المدنية التابع لكلية الهندسة في جامعة ذي قار مع الاخذ بنظر الاعتبار تأثير الموقع والاجواء على الحسابات.

من المهم بيان الفوائد التي تعود على الاطراف المستفيدة من بناء مثل هذه المنظومات. ومن اهم هذه الفوائد هي تخفيض

فاتورة كهرباء جامعة ذي قار. كما يؤدي نصب مثل هذه المنظومات الى تحسين اداء مغذيات الكهرباء الداخلة للجامعة من ناحية هبوط الفولتية وتقليل خسائر النقل التي ممكن ان تصل الى 10 بالمئة من قيمة القدرة المجهزة. اهداف هذه الدراسة المقترحة يمكن تحقيقها خلال حساب تقليل الفاتورة الكهربائية .

متطلبات المشروع :

— . المنظومة لموقع والحراري الشمسي الاشعاع كمية لحساب متخصص برنامج

- منظومة الطاقة الشمسية في قسم الهندسة المدنية.

الدراسة : الصباحية
عنوان المشروع :

Optical band-stop filter and multi-wavelength channel selector with plasmatic complementary aperture embedded in double-ring sonator

إسم المشرف : م.م. احمد عبدالرضا علي
الهدف من المشروع :

The main goal of the project is to obtain plasmatic band stop filter, which can select the output waveguide

خلاصة عن المشروع :

A compact nanoscale wavelength band-stop filter with aperture embedded in double-ring resonator is proposed and numerically investigated by using Comsol software or CST software. With a narrow aperture created between embedded double rings, the modes of the split-ring cavity can be modulated by the aperture in different manners when the parameters of the aperture are changed.

Furthermore, the absorption peaks of resonator modes can be selectively inhibited by altering the positions of the aperture without changing outer size of the resonator. Based on above characteristics, a 1×2 multiple-contact channel selector is designed with a rotating aperture which can select the output waveguide. The proposed filter and selector have potential applications in highly integrated optical .circuits

متطلبات المشروع:

- 1- -Computer with RAM at least 8 Gb**
- 2- -Comsol or CST Software for simulation purpose.**
- 3- -Online Resources.**

الدراسة : الصباحية

عنوان المشروع:

"Design an intelligent automatic transfer switch "

إسم المشرف : م.م حيدر فاضل عباس

الهدف من المشروع:

The aim of this project is to design an intelligent automatic transfer switch and control this ATS remotely by mobile applications like smart life , tuya and ewelink , also we can utilize voice commands that available on smart phone like Bixby or google assistant.

خلاصة عن المشروع:

ATS (Automatic Transfer Switch) is a self-acting switch that senses when the main or public utility supply is interrupted and automatically changes the load to reconnects with a standby source . Switches may be manually or automatically operated. An Automatic Transfer Switch (ATS) is often installed where a backup generator is located, so that the generator may provide temporary electrical power if the utility source fails. It can deal with more than two supplies according to priority that is demanded from the costumer. As well as adding some important features to this device, such as (Relay timer) [which in turn delays the introduction of current to the load according to the preprogrammed timing]. As well as (under / over voltage) [which confirms the voltage entering the load is within the normal voltage 245 - 200 in order to ensure that the equipment is not damaged, and we also program it in advance] with the addition of relays to control the priority of the lines. Moreover we provide this switch with smart on/off devices to remote control it from any place in the world on parole Wi-Fi net is available.

متطلبات المشروع:

- 1- Mcbs.
- 2- Contactors.
- 3- under/ over voltage.
- 4- Ac relays.
- 5- Timers
- 6- Smart on/ off devices

الدراسة : الصباحيه

عنوان المشروع: **Arduino Based Automatic Plant Watering System**

إسم المشرف : م.م. ساره عبد العالى عويد

الهدف من المشروع:

An adequate water supply is important for plant growth. When rainfall is not sufficient, the plants need additional water. We know that people do not pour the water on to the plants in their gardens when they go to vacation or often forget to water plants. As a result, there is a chance to get the plants damaged. In this project we will implementing sensors which detect the humidity in the soil (agricultural field) and supply water to the field which has water requirement.

خلاصة عن المشروع:

The project is microcontroller-based design which controls the water supply and the field to be irrigated. There are sensors present in each field which are not activated till water is present on the field. Once the field gets dry sensors sense the requirement till the sensors is deactivated again. In case when here is more than one signal for water requirement then the microcontroller will prioritize the first received signal and irrigate the fields accordingly.

متطلبات المشروع:

Hardware Tools

- Arduino Uno
- Ultra Sonic Sensor
- BUZZER
- Motor With Tank

Software Tools

- Arduino IDE
- Embedded-

الدراسة : الصباحية
عنوان المشروع:

Efficiency and performance study for practical Photovoltaic PV solar collector

إسم المشرف : أ.د. رافد معلك حنون
الهدف من المشروع:

- Measuring the current, voltage and temperature of PV collector.
- Calculating the efficiency and other performance parameters.
- Analyzing the results to conclude the reasons of study.

خلاصة عن المشروع:

The smart grid technology permits the revolution of the electrical system from a conventional power grid to an intelligent power network which has led the improvements in electrical system in terms of energy efficiency and sustainable energy integration. This project presents the energy management/coordination scheme for domestic demand using the key strategy of smart grid energy efficiency modelling. The structure consists of combining renewable energy resources, Photovoltaic (PV) power generation that erected in college of engineering – University of Thi-Qar connected to the utility grid with energy storage system (ESS) in an optimal control manner to coordinate the power flow of an official labs and rooms. In this project, the students will measure the current, voltage and temperature of PV collector to calculate the efficiency and other performance parameters based on the demand response (DR) schemes in the framework of real-time electricity pricing, this work designs a closed-loop optimal control strategy that is created by the dynamic model of the ESS to compute the system performance index, which is formulated by the cost of the energy flows. A dynamic distributed energy storage strategy (DDESS) is implemented to optimally coordinate the energy system, which reduces the total energy consumption from the main grid of more than 100% of the load demand. The designed model introduces a payback scheme while robustly optimizing the energy flows and minimizing the utility grid's energy consumption cost.

متطلبات المشروع:

- 1- PC.
- 2- Voltmeter.
- 3- Ammeter.
- 4- Thermometer

الدراسة : الصباحية عنوان المشروع :

(Implementation and Control of Inverted Pendulum on a Cart (IPC

إسم المشرف : م.د. علياء محسن مناتي

الهدف من المشروع :

- The first goal is to build a lab model of the Inverted Pendulum on a Cart system.
- The second goal is to create a controller to balance the inverted pendulum in upright position
- Derive a mathematical model of the system then use it for simulating and testing the system and controller in MATLAB/Simulink..

خلاصة عن المشروع :

An Inverted Pendulum on a Cart is a common system often used as a benchmark problem for control systems. The system consists of a cart that can move in one direction on the horizontal plane and a pendulum attached to the cart through a hinge point. The pendulum can rotate 180° on the plane made up of the vertical direction and the direction the cart can move. The system is controlled by applying a force to the cart, to make it move

The lab model is built using a track that the cart can move along, a stepper motor for applying force to the cart and a microcontroller for controlling the system. The pendulum angle and the cart position are measured using incremental encoders. A Mathematical model of the system have been derived. This forms the basis for the design of the controller and is also used for simulating and testing the system and controller in MATLAB/Simulink before it is implemented on the real system. Linear Quadratic Regulator (LQR) is suggested to balance the pendulum in a vertical position

متطلبات المشروع:

- 1-PC.
- 2- Matlab Software for simulation purpose.
- 3- Online Resources.
- 4- Hardware components (Microcontroller, stepper Motor, gear box, position sensor, DC-power supply, cart and slider

الدراسة : صباحية

عنوان المشروع:

Design Model Reference Adaptive (MRA) Controller for Mass-Spring-Damper System

إسم المشرف : م.د. علياء محسن مناتي

الهدف من المشروع:

This project focus on design Model Reference Adaptive (MRA) controller for Single Input-Single Output (SISO) nonlinear system, for example mass-spring-damper system. The model is designed based on an optimal desired model and Lyapunov stability theory. Matlab package will be used to carry out the simulation results for Mass-Spring-Damper controlled by MRA scheme.

خلاصة عن المشروع:

The control design of nonlinear systems is a difficult process, and in practical control system. The plants are always nonlinear. Thus many nonlinear control methods have been developed for nonlinear systems to overcome the difficulty in controller design for real systems. However, in these control system design, the nonlinear systems must have some predictable behaviors, for example the system must be minimum-phase, it must be sufficiently smooth, and the parameters must be exactly known in order for the feedback linearization method to be applied. Furthermore, these control schemes are so complicated. That they are not suitable for practical application.

The most effective and advanced nonlinear control schemes are the adaptive controllers. The basic idea of an adaptive controller is to estimate uncertain parameters and to tune the controller online to adopt to the dynamic situation where the variations in the system parameters or environment are significant.

In general, there are two main types of adaptive control schemes i.e. Model Reference Adaptive Control (MRAC) and Self Tuning Adaptive Control (STAC).

متطلبات المشروع:

- 1- PC.
- 2- Matlab Software for simulation purpose.
- 3- Online Resources.