List of FY title for academic session 2017/2018 -Electric- Final

No	FYP Title	Synopsis	Requirement	Student name	Supervisor
1	Performance Analysis of Three-phase Permanent Magnet Synchronous Motor for Electric Vehicles	Hybrid-electric vehicles and electric vehicles are becoming very popular nowdays. Automative companies such as Honda, Toyota, GM, Ford, VW and Tesla have been producing both vehicles to the customers. The enabling technologies for this innovation are undoubtedly attributed to the three-phase permanent magnet synchronous motor, power electronics converters and battery storage. In this FYP project, the student will learn and discover the recent innovation and design criteria of three-phase permanent magnet synchronous motor (PMSM) for electric vehicles. From there, the student can propose a three-phase PMSM which is suitable for this application. Performance analysis on the proposed motor can be modelled and simulated using finite element anaysis software such Opera or Ansoft Maxwell. Motor performance such as efficiency, torque-speed profile, rated power, rated torque, rated speed, max speed, motor losses, etc can be estimated by the software.	a) student should have taken EEK260 Electrical Machines in 2nd year and passed this course with grade B or better. b) student will take EEK474 Electrical Machine Design Course in semester 7. c) student will learn and master on how to use Opera software to model the motor performance d) Optionally, student can also learn Ansoft Maxwell software to model the motor performance. e) Tutorial on how to learn these softwares (Opera or Ansoft Maxwell) will be given to student. Within one month, student should be able to use the software quite confidently f) Student can read and understand many publications/articles in internets, IEEE website, car company websites, etc about electric vehicles in order to get some knowledge on this topic	NUR SYAHIRAH BINTI ABDUL SANI	PM Ir. Dr. Dahaman Ishak
2	Two dimensional Simulation Study on IBC Solar Cell performance under 1-5 suns using Silvaco TCAD.	Synopsis- In this study, the performance of interdigitated Back Contact (IBC) solar cell will be evaluated through design, building and testing through technology computer aided design (Silvaco). The structure of the IBC need to be design in two	Skills required- Software, hardware.	Mohamad Nazren Bin Zulkifli	Dr Mohd Khairunaz bin Mat Desa
3	Photovoltaic Thermal Collector system based on Heterojunction Intrinsic (HIT) panel.	In this project, PVT system based on heterojunction intrinsic panel (HIT) will be design, built and tested. The system will not only providing electricity but also hot water/air depending on the thermal media choose. The performance of the panel will be evaluated and also compare with conventional silicon solar cell panel.	Skill required- Software, hardware	Muhammad Nasrul Faiz Bin Rosli	
4	State-of-Health Prediction and Monitoring of a Lithium-ion battery in a Mobile Phone for Battery Lifetime Analysis	Precise State-of-Charge (SoC) estimation is critical for practical Battery Energy Storage Systems (BESSs) to prevent overcharging and deep discharging of each individual cell, which may cause major failure and serious deterioration in system performance. Improvement could be made to most system available today by integrating hybrid or model-based SoC estimation methods into balancing controller to improve the accuracy and the robustness of the SoC estimation. State-of-Health (SoH) of each cell can be included as an additional parameter in the balancing controller. The accuracy of SoC estimation is greatly affected by cell degradation. SoH prediction can be performed by monitoring the number of charge/discharge cycles, capacity and/or internal resistance, etc.. The knowledge of the SoH, which can be incorporated into balancing controller, is required to predict cell degradation in order to prevent a possible failure and to plan replacement. The balancing controller chooses a cell combination in order to get as close as possible to the value of the reference voltage by monitoring both the SoC and SoH of each cell. For instance, a cell with higher SoC will not be used when system is discharging if its SoH shows that the cell will fail. Early detection of cell degradation allows the BESS to take remedial action, preventing serious damage to the system.	EEK361 Power Electronics, EEE382 Probability and Engineering Statistics, Both hardware and software, MATLAB	LEOW YOONG YANG	Dr. Ooi Chia Ai
5	Effieciency Comparison of Direct DC-AC Power Conversion System and Conventional Power Conversion Systems	In a Battery Energy Storage System (BESS), energy must be transferred in and out of the battery pack. Thus, the overall efficiency of the BESS, or round-trip efficiency, is greatly affected by the power conversion system (PCS) efficiency. An efficiency study can be performed to compare the conduction and switching losses between direct DC-AC PCS and conventional PCSs, where these are the primary sources of loss. Conduction loss can be modelled as a fixed voltage source that accounts for the voltage drop on each conducting device, connected in series with a resistor. The energy loss each time a switch is turned on and off depends on the driving circuit and can be considered proportional to the DC voltage and the instantaneous value of AC current.	EEK361 Power Electronics, EEK373 Advanced Power Electronics, Software, MATLAB	MUHAMMAD NAJWAN BIN HAMIDI	
6	Comparison of various load flow algorithms in both well and ill-condition system	In this project, a few load flow algorithms namely Gauss-Seidel, Newton-Raphson and Fast Decoupled are studied and implemented on both well and ill-condition system for comparison and improvement. Matlab programming skill is required.		NUR ATIKAH BINTI TAJUDIN	Dr. Tay Lea Tien
7	Improved Newton-Raphson method in load flow analysis	In this project, Newton-Raphson algorithm in load flow analysis is studied, implemented and modified for improvement using some standard IEEE bus systems. Matlab programming skill is required.		RABIATUL ADAWIYAH BINTI MOHAMAD ZUKRI	
8	Improvement of Rogowski Coil Development for Partial Discharge Measurement	In this project the Rogowski coil for partial discharge (PD) will be developed. The work will be focused on the improvement of previous development of Rogowski coil on diagnosing the partial discharge signal. The Rogowski Coil will be intergrated with the op-amp integrator to obtained high gain output and to provide the appropriate frequency bandwith which corresponding to the frequency of partial discharge signal. Some measurements and analysis will be carried out on the sensitivity of Rogowski coil with consideration of variable parameters.	1) Basic knowledge of Electromagnetic 2) Knowledge in high voltage engineering	PUOVIN A/L MURUGAIAH	PM Ir. Dr Mohamad Kamarol bin Mohd Jamil
9	Dielectric properties of Virgin Coconut Oil As High Voltage Insulator	The project aim is to investigate dielectric performance of the virgin coconut oil as alternative material for liquid insulator in high voltage application. The work involve in lab testing according to the standard for new oil for HV insulation purposes.	Hardware	Siti Syafiqah Binti Mat Sauki	Ir. Dr. Nor Asiah Binti Muhamad
10	Partial Discharge Characteristic of Kenaf-Based Kraft Paper	The project aim is to investigate partial discharge charateristic of newly introduced based material for production of kraft paper. The new material is the kenaf –based paper. The standard PD test is required to be run in lab for determine the PD characteristic of this new material.	Hardware	Muhammad Aid'zuddin Bin Nor Azli	
11	Monitoring and fault diagnosis of electrical installation using thermal imaging	In an electrical installation, when there are faults in the equipment, the thermal condition of the equipment will change. This can be detected by using a thermal imager. This project will investigate the use of thermal imaging for the monitoring of electrical installations such as circuit breakers, switches and feeders.	1. Have some basic knowledge of C++ or Matlab programming 2. Have interest to learn some image processing techniques	TIONG KING HOCK	Dr Teoh Soo Siang
12	IoT-based environmental condition monitoring system	This purpose of this project is to design an embedded system that can be universally used to monitor the parameters in a given environment. The environmental parameters are such as temperature, humidity, air pressure, light, noise and vibration. Sensors connected to the system will collect all the real-time data from environment and these data will be processed, displayed and uploaded to a web server. User can access this data from anywhere through Internet.	1. Have some basic knowledge in C++ programming 2. Have some experience and interest in developing Arduino or Raspberry Pi application	HENG QIAO HUI	
13	Maximizing the integration of wind energy through dynamic thermal rating (DTR) system	This project investigates the role of the DTR system in integrating the wind energy from a reliability viewpoint. That being said, the IEEE 738 standard is heavily involved and a thorough understanding of it is expected. Due to the chronological characteristics of wind and the weather parameters that influenced the line ratings, the sequential monte carlo (SMC) simulation method is employed.	1) Want to continue as a PhD candidate after the completion of the project. 2) MATLAB programming skills. 3) Self-driven and determined.	SIM KAI SHENG	Dr. TEH JIASHEN
14	Development of power management circuitry for battery less body patch	The project focus on development of battery less power management for body patch application in temperature and stress monitoring. The project will involve inductor design as energy harvesting , then integrate with texas power management IC. This circuitry will be printed on TPU substrate with SMT component.	Power electronics, circuit theory and instrumentation and measurement.	ZULKIFLI BIN ABDUL HALIM	Assoc. Prof. Dr. Asrulnizam Abd Manaf