List of FYP title for academic session 2017/2018 -Electronic Final

No	FYP Title	Synopsis	Requirement	Student Name	Supervisor
1	High-Q Sensor Based on Metamaterial Resonator for Solids Material Detection	This work will produce structures of planar microwave sensors for detecting and characterizing the dielectric properties in common solid materials which produce high Q-factors with capability to suppress undesired harmonic spurious. These sensors are based on planar split ring resonator with capacitance load by employing the perturbation theory, in which the dielectric properties of the resonator affect the Q-factor and resonance frequency. The proposed sensors should achieve narrow resonance with low insertion loss and high-Q and sensitivity at 2.45 GHz operating frequency. By using a specific experimental methodology, practical materials are applied as standards (Roger 5880, Roger 4350, FR4) to validate the sensitivity of the sensors for permitting potentially material characterization and detection. Accordingly, the mathematical equation is derived to extract the materials with unknown properties.	1. Tools: Agilent ADS and CST Microwave Studio 2. Software and Hardware 3. Not related to Innovate 4. Publication.	Aina Qistina binti Md Taha	Dr Nor Muzlifah Mahyuddin
2	Enhancing Security in IoT Home Based Automation using Hybrid RS-LDPC Codes	Internet of things (IoT) seems to be the next big thing. The scope of IoT is constantly evolving while engulfing technologies like smart grids, smart homes, smart cities etc. Talking about smart homes, the operations invoked by the user may malfunction and hence can prove catastrophic if an error gets introduced in the bit pattern in data repository/communication channel due to noise or other factors. Hence this work requires a mechanism for averting any such possible catastrophe in IoT based home automation by implementing a hybrid code a product of Reed Solomon Codes and LDPC codes, for error detection and correction before any operation invoked by the user gets executed. The framework has to be implemented using Raspberry Pi (Zero or Zero W) device.	1. Tools: Matlab or any other compatible programming tools 2. Software and Hardware (understand how Raspberry Pi works) 3. There is an option for Innovate or any related Competition 4. Publication	Ng Lay Wei	
3	Development of Multicarrier CDMA Wireless Sensor Network	In this project student will use both the ARDUINO Bluetooth and GSM modules to create a wireless sensor network. For each of four wireless sensor device will utilize the same frequency carrier with different phase to create the multicarrier scenario. Walsh code can be used as the CDMA codes. Student need to create an algorithm for accessing the wireless channels of the network.	EEE123 (C++), EEE320 (Microcontroller), EEE332 (Communication), EEE377 (Digital Communication), EEE449 (Computer Networks)	OOI TEIK CHEN	AP. Dr MOHD FADZLI BIN MOHD SALLEH
4	Development and Implementation of QAM Generated Signals using FPGA for Digital Data Transmission	In this project student is required to design a Quadrature Amplitude Modulation (QAM) for M=8, 16, 32 etc signals. First, the design should be in simulation software (MATLAB/MULTISIM). Then, the designed transmitter should be implemented in ALTERA FPGA board. Intregration with a RF front end circuit can be included if the time premit.	EEE123 (C++), EEE320 (Microcontroller), EEE332 (Communication), EEE377 (Digital Communication)	Nasruddin Bin Abdul Rauf	
5	Printed Elliptically Polarised STAR Dipole	Previously an elliptically polarised STAR dipole antenna was fabricated using copper wire, which was suitable for demonstration purposes in showing the ability of elliptical polarisation to form polarisation multiplexing. Alternatively, other elliptically polarised antenna designs could be formed to improve multiplexing gain. One recommendation is to print the STAR dipole antenna design onto a substrate and make it a planar structure. The printed STAR dipole would then be more accurate and easier to be manufactured.	- Knowledge in ADS and CST - Knowledge in Microwave Engineering, Antenna and Propagation	MUHAMMAD HAZIQ BIN AB MUTALIB	Dr Intan Sorfina Zainal Abidin
6	Compact Planar Hybrid Coupler	A hybrid coupler can be used to decouple and increase the isolation between antenna ports. A more suited and compacted method of achieving such isolations can be designed such that it can fit into small devices such as mobile phones and wearables. A compact hybrid coupler can then be printed onto a microstrip to achieve a planar structure.	- Knowledge in ADS - Knowledge in Microwave Engineering, Antenna and Propagation	Mohd Hafiz bin Abd Halim	
7	DESIGN & IMPLEMENTATION OF A BLUETOOTH FIRMWARE DRIVER FOR ARM CORTEX-M0	Design and implement a bluetooth driver for ARM CORTEX-M0 using C-programming language. The project can be hardware-based in which an ARM CORTEX-M0 training board needs to be purchased or software-based in which an FPGA design for testing purpose is required. On the other hand, a software-based simulation project using MATLAB can be an alternative if necessary.	C-Programming language skills is a compulsory requirement & EEE379 (Computer Systems & Multimedia) course is an added advantage.	Mar Hee Sheng	AP. DR. JUNITA MOHAMAD SALEH
8	Physical simulation of high resistivity substrate	The effect of charges associated with oxidised silicon subsrate will be studied through physical simulation. Capacitance-voltage characteristics of a MOS device will be used as the basis of the structure analysis.	Interested in semiconductor physics and devices and a competent user in Matlab. It is a physical simulation-based project, hence, flexibility in using new simulation software is needed.	MUHAMAD TARMIZI BIN SAAD	Dr. Nur Zatil 'Ismah Hashim
9	DESIGN AND SIMULATION OF LOW POWER COMPARATOR USING LOW POWER DESIGN TECHNIQUES FOR ANALOG CIRCUITS	In today's advanced technology, consumer are expecting long life battery life in all their portable electronic devices. This is because power source are not easily available everywhere as the portable electronic devices are carried from one place to another. Power reduction techniques are mostly applied in the digital circuit instead of analog circuit. This is because analog circuit are very complicated and complex. One of the biggest growing building blocks of analogue circuit is flash ADC which tends to be one of most developed ADC to be used in high speed and low power design. In flash ADC, the number of comparator increased exponentially as the resolution of the ADC is increased. Thus, low power and high speed comparator accuracy is important to deliver a good ADC performance. As the CMOS technology is shrinking, power consumption has been a major concern. Besides, high power consumption leads to high cost of packaging and cooling in order to minimize the heat dissipation from the circuit. Therefore, a study is to be conducted on finding solutions to tackle the mentioned issues by investigating the current available low power design techniques in terms of its suitability in low power analog circuit.	Cadence	SYAFIRA BT RASIDI	Dr Mohd Tafir Mustaffa
10	CURRENT STEERING DIGITAL ANALOG CONVERTER (DAC) USING PARTIAL BINARY TREE NETWORK (PBTN)	DACs are essential operations in many digital system which required high performance data converters. With shrinking of supply voltage, budget constraints of test times, and rising bandwidth requirement causing DAC architectures highly relying on matched components to perform data converters. However, components matched are nearly impossible to fabricate, there are always mismatch errors which caused the difference between the designed and actual component value. Dynamic Element Matching (DEM) is one of the techniques that are commonly used to reduce component mismatch error. This technique is a randomization technique to select one of the appropriate codes for each of the digital input value before entering DAC block. With this technique, the time averages of the equivalent components at each of the component positions are equal or nearly equal to reduce the effects of component differences in electronic circuits. The drawback of existing works is DAC would suffer from excessive digital hardware complexity. A complicated encoding is usually necessary for conventional DEM encoders which will lead to a lot of switch transitions at the same time and it will bring glitches to the output signal.	Cadence	Mohd. Azim Bin Mohammad Alias	

11	Design of Multi Band Antenna for 5G Application	A multiband antenna that works at multi-band frequecy is required to support 5G application. Such antenna is feasible to support big data application and multifunction system like voice, SMS, images etc.	RF & Microwave, Antenna & Propagation	Wan Nasrul Hakim Bin Wan Ismail Nasiruddin	Profesor Widad Ismail	
12	Improving accuracy in automatic modulation classification (AMC) of digital modulated signals using design-of-experiment (DoE) methods	This project involves studying how the DoE-based statistical methods can be used to improve the accuracy in digital modulated signals. The student would learn to make an informed choice on and the types of digitally modulated signal(s) they would focus on, as well as to compare and justify suitable method to improve accuracy.	Knowledge of digital modulation and basic statistics	Chan Wui Hung	En Mohd Nazri Mahmud	
13	Improving the understanding of the dynamic properties of advanced communication networks using agent-based modelling approach	This project involves studying how the Agent-based Modelling approach can be used to improve our understanding of the dynamics of advanced communication networks that are characterised by self-organisation, cooperation and cognition. The student would learn to construct communication networks and simulate their dynamics and discuss how the approach provides advantages in understanding those dynamics over the conventional modelling approaches.	Knowledge in Communication networks	Nur Syazana binti Mat Yusof		
14	Low Noise Amplifier for Medical Band Amplifier	The design should be based on concept of Inductorless Low Noise Amplifier. Inversion Coefficient could be used to improve the power-aware design.		Abbiramavali D/O Segaran	PM Ir. Dr Arjuna Marzuki	
15	Mixer for Medical Band Amplifier	Mixer is based on current resue architecture. Three parameters which are the conversion gain, noise figure and distortion need to be considered/met. The LO-drive should be low.		MOHAMAD REDZUAN BIN ABU BAKAR		
16	Artificial intelligence for microwave circuit simulations	This project will apply an artificial neural network (ANN) algorithm to perform analysis of microwave circuits such as transmission lines. Student will learn the basics of ANN, methods to train the ANN, and apply the ANN to different circuit configurations.	Project involves programming in Matlab. Knowledge of microwave circuits is beneficial.	Kong Chun Lei	Dr. Patrick Goh	
17	Modeling and simulation of large signal and power delivery networks on IC and PCB.	This project will apply an existing circuit analysis algorithm to simulate large signal and power networks on integrated circuits (IC) and printed circuit boards (PCB). Student will use existing modeling techniques to create circuit models of these networks and then apply the circuit analysis algorithms to perform simulations of high-speed digital signals.	Project involves programming in Matlab. Student should have a good programming background.	CHIN WEI CHUN		
18	Indoor Localization and Direction Sensing via RFID approach	One of the technical challenges in RFID-based localization is the estimation of the distance from the interrogator to the transponder. In this work, a suitable technique for indoor localization and direction sensing based on the fusion of multiple methods such as received signal strength and time difference-of-flight or time-difference-of-arrival will be investigated.		NURUL EFFAH BINTI RUZAIDI	DR NUR SYAZREEN AHMAD	
19	Design and Development of Optimal Control Strategy for Collision Avoidance	This is an on-going project where the focus is on the design and development of optimal control strategy via simulation and experiment for collision avoidance. In this work, several obstacle detection techniques such as sensor fusion and artificial potential field will be used to evaluate the performance of the control methods.		NG SING YEE		
20	Re-design an 8051/8085 educational board.	Student is required to design an 8051/8085 educational board with additional/advanced features that possible to use either with USB interfacing or stable serial communication for donwloading the executed code to the board. Additional port or any external devices may need to be interfaced with special circuit protection in order to protect the device.	Familiar with 8051/8085 assembly language and PCB	MUHAMMAD FIRDAUS BIN ABDULLAH	En. Ahmad Nazri Ali	
21	Realization of the 1D Local Binary Pattern Algorithms in Altera Board for iris classification using k-NN classifiers.	Student is required to apply the 1D Local Binary Pattern for iris classification using k-NN classifiers using the Verilog language in Altera Board.	Familiar with verilog language and the quartus II for altera board.	SIOW SHIEN LOONG		
22	Development of digital image recoloring algorithm	Color digital images contains more information as compared with grayscale digital image. Therefore, in this project, the student is expected to develop a system, with a new algorithm, to help user to convert grayscale image to color image.	Student interested in digital image processing. Strong programmin skill is required.	Noorfairuse Binti Mohamad Noor		

No	Title	Description	Requirements	Student	Supervisor
23	Development of Android based health monitoring system	In this project, the student is expected to develop a system that can help user to monitor some signals, such as blood pressure and temperature. The sensors will be integrated with hand-held devices with Android, for processing. This project is both software and hardware project.	Strong in programing and hardware development. Priority will be given to student with experience in Adroid programming. Knowledge in artificial intelligence is a bonus.	OOI YOONG KHANG	AP. Dr Haidi Ibrahim
24	Development of 3D segmentation method	In this project, the student is expected to develop a segmentation method to extract important information from 3D dataset.	Student interested in digital image processing. Strong programming skill is required.	Chew Chin Boon	
25	Low-level video processing on FPGA	A few video processing algorithms are to be performed on a live video stream captured using a webcam connected to an FPGA and the outputs are to be displayed on a monitor	Verilog and C Highly committed and able to work independently under minimal supervision	CHEN KOK KEAT	Dr Mohd Ilyas Sobirin Bin Mohd Sazali
26	An affordable HD Surveillance Camera	A surveillance camera recording HD-quality videos is to be built using a Raspberry Pi micro-computer	Willing to learn Python Highly committed and able to work independently under minimal supervision	VIGNES A/L KUMARAN	
27	Heartbeat biometrics based on I-Vector	During last decade, the use of electrocardiogram (ECG) signal in biometric recognition has increased. ECG signal data is exploited as a biometric for human identification as well as classification due to its unique characteristics. The ECG records the heart activity and it is unique as different individual has distinct heart structure. Hence, ECG characteristics are distinct among individuals and ECG provides vital information to differentiate one individual from another. The existing biometric authentication systems such as fingerprint, facial or voice are not reliable as the information can be counterfeited. The made ECG suitable for human recognition as it is impossible to be faked as it is an internal signal producing by complex biological activity in the heart. This project proposes a reliable ECG analysis and classification approach using I Vector. I-vector is an interesting mathematical formulation which is based on factor analysis as studied in multivariate statistics.	Pyton programming using Spear Toolbox	CHIA PEI KIAK	AP Dr Dzati Athiar Ramli
28	Design and simulation of resonant tunneling diode based high frequency MMIC oscillator	To create library file for RTD and apply the model in high frequency oscillator circuit	software - spice/ADS, analog electronics	CHIA YING YING	Dr. Mohamad Adzhar Md Zawawi
29	Physical modeling of multi quantum well (MQW) p-i-n InGaAs/InAlAs solar cells	To create physical model of MQW InGaAs/InAlAs solar cell and simulate the IV characteristics	software, semiconductor device physics	Logaruthran A/L Muniappan	
30	Improvement of Raspberry Pi based finger vein recognition system	In this project, you are required to improve the recognition accuracy of the existing Raspberry Pi based finger vein recognition system. The focus is on the feature extraction and matching stages. The student needs to study the new type of feature extraction and matching algorithms and implement it into the Raspberry Pi using c++ and OpenCV.	This project is mainly in the implementation of algorithms on Raspberry Pi using C++ and OpenCV.The student needs to be strong in understanding the mathematical algorithms written in a journal and able to implement it into MATLAB and also C++ (by utilizing OpenCV). This project is suited for the student that have excellent analytical skills and also love to explore the new idea to solve a problem.	QUEK EE WEN	AP Dr. Bakhtiar Affendi Bin Rosdi
31	Design of 0.13-um CMOS flat and high gain wideband LNA for cognitive radio application	The LNA to be designed is to be used in a cognitive radio; i.e. in the range of 300 MHz to 10 GHz. The design of the mentioned LNA will be based on post-layout simulation. Upon completing the project, student will achieve the following outcomes: (i) the ability and know how of IC designing a low noise amplifier for wideband cognitive radio application; (ii) skill of using cadence pre- and post-layout simulation that will add merits to student's CV	(i) has interest and passion to design a low noise amplifier; (ii) had taken VLSI System (EEE344) and Introduction to IC Design (EEE348); (iii) required to take Design of Integrated Analog Circuit (EEE445)	MUHAMMAD ASYRAF BIN ROSLAN	AP. IR. DR. NORLAILI MOHD. NOH
32	Design of 90-nm CMOS flat and high gain wideband LNA for cognitive radio application	The LNA to be designed is to be used in a cognitive radio; i.e. in the range of 300 MHz to 10 GHz. The design of the mentioned LNA will be using LT SPICE. Upon completing the project, student will achieve the following outcomes: (i) the ability and know how of IC designing a low noise amplifier for wideband cognitive radio application; (ii) skill of using LT SPICE that will add merits to student's CV	(i) has interest and passion to design a low noise amplifier; (ii) had taken VLSI System (EEE344) and Introduction to IC Design (EEE348); (iii) required to take Design of Integrated Analog Circuit (EEE445)	Thinnesh Kumar a/l Ramakrishinan	
33	High Frequency Distilled Water Antenna	High Frequency (HF) communication system is very important for long distance communication especially for tactical based camp for army. Therefore, lightweight antenna system is required for easy movement of the army platoon far into the jungle. This project will involved the simulation, fabrication and testing of the distilled water antenna for HF radio communication system.	Fundamental knowledge in RF and microwave circuit design.	MUHAMMAD ANWAR BIN ZULKIFLI	Prof. Ir Dr Mohd Fadzil Ain
34	Physical Simulation for Ultra-Fast and High Breakdown Electronics.	This project will address the simulation and modelling of device with high frequency and high breakdown for various applications using the available physical Technology Computer-Aided Design (TCAD) software. In physical modelling the device is represented in terms of physics-based parameters and device geometry.	Good knowledge in transitor operation and Matlab.	Tan Hui Wen	Dr. Mohamed Fauzi Bin Packeer

No	Title	Description	Requirement	Student	Supervisor
					Bin Packeer Mohamed
35	Linear Modeling for Ultra-Fast and Low Noise Device Using ADS	This project is on the empirical modeling using ADS for high mobility transistor which becoming important for application with high speed and low noise integrated circuits. Hence an accurate linear and non-linear models of a transistor are needed to design a circuit and subsequently predicting the performance of the system. However the focus in this project will only be on Linear modeling.	Good knowledge in transitor operation and ADS.	Ang Wei Keat	
36	PAPR Reduction in OFDM System Using Principal Component Analysis	Firstly, OFDM signal is processed using Principal Component Analysis or PCA to reduce PAPR, and then further reduction is done by using clipping and filtering method. This constitutes a significant reduction in PAPR without the degradation of bit error rate (BER).	MATLAB	Putri Nurzubaidah Binti Haji Ahmad Tajudin	Dr. Aeizaal Azman
37	PAPR reduction using genetic algorithm in OFDM System	Genetic algorithm is used together with partial trasmit sequence for PAPR reduction.	MATLAB	FATIN NAJWA NURSYADZA BINTI MOHD RAMDAN	
38	Embedded AI to navigate cart follower	Artificial Intelligent such as fuzzy, neural network or expert system can be used to navigate cart follower.	EEE320	Tang Khai Luen	Dr. Syed Sahal Nazli Alhady
39	Controlling deferential motor using microcontroller	Deferential motor used to easy manuaver of particular cart. Microcontroller can be use to control deferential motor use as cart follower	EEE320	MOHAMMAD AZREEN B MAT JEMIN	
40	Implementation of GA algorithm for hardware software partitioning.	NIL	NIL	Loo Fang Hean	AP. Dr. Zaini bt Abd Halim
41	Implementation of PSO algorithm for hardware software partitioning	NIL	NIL	Tan Jia Zheng	
42	Implementation of hardware software partitioning in telemedicine application	NIL	NIL	MASYIRAH BINTI MOHD NOR	
43	Edge detection techniques in color images	NIL	NIL	MURNI NUR ATHIRAH BINTI ROSNAN	AP. Dr. Harsa Amylia Mat Sakim
44	Power management circuit ic.	NIL	NIL	Muhammad Haris Azman bin Anuar	En. Zulfikar Ali Abdul Aziz