Project Title: HR Management System (HRMS)

Project Supervisor: *Musa M.Ameen*

Synopses:

Human Resources is an important unit in each organization (public and private). That unit performs the tasks for recruiting, follows the daily personnel works and their permissions for their leave, interviewing or monitoring the interviews, training, etc. The documentation and archive of the personnel's documents, leave permission and CV bank are the most important tasks that must be done with the help of an online system to make the tasks be easier and better. By using programming tools, this project aims to provide a convenient web application to manage and organize the HR office tasks in Ishik University. Web technologies can be used to develop an environment that's user friendly and convenient. Application helps HR to manage, organize, and track all the tasks. The project includes (but not limited to) achieving the following:

• Adding, Editing, Deleting a person's account, and documents available for the person

• Managing leave requests of the staff, daily and annual

• Providing different interface for Admins and Staff

• Providing multiple reports and statistical graphs

• Providing a modern dashboard for the admins and the other users

Expected Student Background:

• Good programming background is recommended.

• Basic knowledge in PHP, HTML, JavaScript, and CSS.

• Basic knowledge in Relational Database and SQL.

Project Requirements:

Design a web application described above using PHP considering

• Using their programming skills to develop a web application

• Developing a functional admin dashboard to manage the web application.

• Writing well-documented source code to achieve functionality

• Additional frameworks and tools could be used for the development

• Writing a professional report and manual about the system

Important:

The required components to develop such system must be provided by the students. Most of the tools needed to develop such system available online for free. However, any additional costs needed to purchase the software tools must be provided by the students. The university **might** cover the expenses for such purchase.

What will you learn?

This is a great chance to learn and develop a system from scratch practically. At the end students will learn, how to develop a web application starting from project requirements, programming, testing, and finalizing the system. They will also learn about HTML, CSS, and JavaScript. The project is just a prototype but could be used in the real environment in the future.

Project Title: Office Assets Management System (OAMS)

Project Supervisor: *Musa M.Ameen*

Synopses:

Maintenance and infrastructure directory of Ishik University is the responsible department to track every asset around the campus. The main aim of this project is to develop a web-based asset management system using the existing technologies. This will help the directory to easily Find, add, move or delete from the asset list of any room/Laboratory within the maximum optimizable time. Estimate total cost of all assets that belong to the university. Upon successful lunching of the (OAMS), Maintenance and infrastructure directory will start using the system and replace their old system which has been created using MS Excel spreadsheets. The project includes (but not limited to) achieving the following:

• Adding, Editing, Deleting a assets and stocks available in the offices

• Managing stocks in the inventory for each department

• Providing different interface and roles for Admins and Users

• Providing multiple reports and statistical graphs

• Providing a modern dashboard for the admins and the other users

Expected Student Background:

• Good programming background is recommended.

• Basic knowledge in PHP, HTML, JavaScript, and CSS.

• Basic knowledge in Relational Database and SQL.

Project Requirements:

Design a web application described above using PHP considering

• Using their programming skills to develop a web application

• Developing a functional admin dashboard to manage the web application.

• Writing well-documented source code to achieve functionality

• Additional frameworks and tools could be used for the development

• Writing a professional report and manual about the system

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Project Title: Design of Smart Street Cross-Walking System

Project Supervisor: *Dr. Yasir Hashim*

Synopses:

This project developed Smart Street Cross-walking System. This project is developed to give priority to the pedestrian to cross the road effortlessly. The system incorporates the concept of sensor detection to sense the presence of pedestrians and in turn automatically controls the traffic lights. A bidirectional communication concept is applied in transmitting the signal from one traffic light to the other. The developed system must be worked on the real environment of a 6m width of road.

Expected Student Background:

• Good programming background is recommended.

• Basic knowledge in electronics.

Project Requirements:

Design the electronic circuit described above using Arduino based boards (more than one) considering

• Using appropriate sensors & devices to achieve the purpose.

• Write well-documented Arduino code to achieve functionality.

Important:

The required components to build such system must be purchased. The type and quality of such components must be based on agreement with the supervisor. The university might cover the expenses for such purchase. However, there is no guarantee and is subject to the availability of funds. In this case, it's the students' responsibility to obtain the required components.

What will you learn?

This is a great chance to learn practical electronics and coding real-time applications to achieve a useful function. The project is just a prototype but could be expanded into something more serious in the future.

Project Title: Design of Smart Traffic Light System

Project Supervisor: *Dr. Yasir Hashim*

Synopses:

This project developed Smart Street traffic light System. This project is developed to give priority to the more crowded street to use the road. The system incorporates the concept of sensor detection to sense the presence of street conditions and ON or OFF the lights automatically depending on these conditions.

Expected Student Background:

• Good programming background is recommended.

• Basic knowledge in electronics.

Project Requirements:

Design the electronic circuit described above using Arduino based boards (more than one) considering

• Using appropriate sensors & devices to achieve the purpose.

• Write well-documented Arduino code to achieve functionality.

Important:

The required components to build such system must be purchased. The type and quality of such components must be based on agreement with the supervisor. The university might cover the expenses for such purchase. However, there is no guarantee and is subject to the availability of funds. In this case, it's the students' responsibility to obtain the required components.

What will you learn?

This is a great chance to learn practical electronics and coding real-time applications to achieve a useful function. The project is just a prototype but could be expanded into something more serious in the future.

Project Title: Online Attendance Checker

Project Supervisor: *Dr. Abbas M. Ali*

Synopses:

Nowadays, instructors are facing some problem to check an attendance of students in the class lecture, since some class may contain more than 50 students. When the instructor checks the names of students it will take some time, for reading names of students and then list the absence names in addition to some extra processes for available and attendance students. Taking attendance students process using Image Processing or computer vision, has been developed to solve the problem that instructor with low cost. Use image processing to detect an absence student and provide information such as number of attendance student and their locations in the class. The system captures image using surveillance camera and process the image to counting available space in the classroom.

Expected Student Background:
• Basic MATLAB/CPP programming background recommended.
• Some Image processing methodology using MATLAB.

Project Requirements:
• Conduct a research that involves surveys to see what skills and activities and some previous research.
• Based on the results of the research, we will select the classroom places of students and the methods will be included in our work.
• Design of the system to check the actual results and score the percentage of correct and mistake in the system.
• Populate the system with actual data to show how the system works.

What will you learn?
Working with image processing systems that involves the least of programming and much of design to ensure achieve the target.

Project Title: Public News Android App

Project Supervisor: *Assistant Lect. Mohammad Salim Al-Othman*

Synopses:

Public News App is a System helping the users to know the news, articles or any interesting things happening around their Locality. This System helps the local public to keep themselves up to date about the happenings around their vicinity or locality or in their City. The latest news is shown first and so on, the user can also refresh the news resulting the latest one shown first and current news will be closed. The Look and feel of reading the news is exciting and amazing as the system provides swipe to move to the next or previous news with transition effects.

The followings criteria should be considered:

- The user is updated with everything going around his city.
- Easy to use.
- The news can be viewed by any user download the app.
- App requires an active internet connection.
- The user can't view the news of different cities in the same time.

Expected Student Background:

- Basic Android Apps development skills.
- Knowledge of SQL and/or SQLite.
- Android Networking

Project Requirements:

- Setup and install Android Studio.
- Design of UI by using XML.
- SQLite database.
- HTTP request and JSON.

What will you learn?

Development of Android Apps that involves many activities such as design friendly UI with using HTTP networking and JSON parsing. This is your chance to practically research, design and implement an IT project based on requirements.

Project Title: Android Smart Alarm System

Project Supervisor: *Assistant Lect. Mohammad Salim Al-Othman*

Synopses:

Alarm System like any other Alarm System on Android Device allows the user to set an Alarm. While Setting an Alarm the user to select or enter the Time in the 24-hour Clock format, can name the Alarm and can set an Alarm tone. While Selecting the Alarm tone, the tone is play backed. This system has no option for snooze but has a unique Activity to shut the Alarm Off. The Activity is a Simple Quiz of Mathematical Questions. Once the User has selected the right answer the Alarm will be shut off. The Alarm can be updated, or the Old Alarm can be turned on from the Home Page. This System uses a Background Service to check the current time and the time in the database. The followings criteria should be considered:

- Any number of Alarm can be Set.
- An Activity to shut off the Alarm.
- The Alarm tone is played when you select it.
- The User can name the Alarm, so it may also work like a reminder.
- Old Alarms are saved.
- No Snooze option.
- No Repeat Option for an Alarm.
- Activity may be Time Consuming.

Expected Student Background:

- Basic Android Apps development skills.
- Knowledge of SQL and/or SQLite.

Project Requirements:

- Setup and install Android Studio.
- Design of UI by using XML.
- SQLite database.

What will you learn?

Development of Android Apps that involves many activities such as design friendly UI with using local database. This is your chance to practically research, design and implement an IT project based on requirements.

Project Title: A Doctor Appointment Application

Supervisor: *Dr. Mohamad Aldabagh*

Synopses:

Life is becoming too busy to get medical appointments in person and to maintain a proper health care. The main idea of this work is to provide ease and comfort to patients while taking appointment from doctors and it also resolves the problems that the patients has to face while making an appointment. Using Android studio program, the android application will be developed one for doctor and another for patient. This project includes the following:

- An application for Doctors which includes all details about patients and their appointments.

- An application for patient which can use to take an appointment and contact with doctor

Expected Student Background:

- Good programming background is recommended.
- OOP programming skills is also recommended.
- Basic knowledge about mobile applications.

Project Requirements:

- A computer to install Android Studio Software
- An android mobile device is recommended to test and implement the application

What you will learn?

This is a great chance to learn how you can develop an android application which can handle some issues in our society and make our life much easy. This project can help you to understand the basic of android application to expand this application or develop another application in the future.

Project Title: Student Learning Application

Supervisor: *Dr. Mohamad Aldabagh*

Synopses:

The teaching in Kurdistan region / and Iraq has been facing many problems. one of these problems is traditional way of teaching for students at primary and secondary school. This an Android application attempts to build interactive application which can help the students at primary/ secondary schools to study course such as Math, Sciences in interesting and interactive ways. This application will contain all subjects for at least two courses in primary/ secondary schools, which means the application will exactly contain the martials of hard copy of students' books.

Expected Student Background:

- Good programming background is recommended.
- OOP programming skills is also recommended.
- Basic knowledge about mobile applications.

Project Requirements:

- A computer to install Android Studio Software
- An android mobile device is recommended to test and implement the application

What you will learn?

This is a great chance to learn how you can develop an android application which can handle some issues in our society and make our life much easy. This application can participate to improve the way of education for students in primary and secondary schools, which can improve the quality of teaching in our schools nowadays.

Project Title: Creating Responsive web app for a collaborative based Dictionary

Project Supervisor: *Dr. Polla Fattah*

Synopses:

Responsive web apps play important role in today's programming world as the users can use same program in different platforms at the same time. This enables programmers to write one program which can be used everywhere. This is huge time and money saving for the programming firms. This method also opens many possibilities of new ways for users to interact with each other. The aim of this application is to enable multiple users from different domain of expertise to add multiple meanings to the same word according to their specific field of science.

For a secure and correct collaboration to happen, there should be clear and precise user permission and hierarchy so that the users will not step on each other toes but at the same time there should be some sort of users who can supervise them to ensure the quality of the published entries.

Expected Student Background:

- Good programming background in JavaScript (may be PHP too)
- Good knowledge of HTML, CSS.
- Basic understanding of database
- Understanding of new converged web technologies.

Project requirements:

- Design web based responsive app using HTML, CSS, and JavaScript.
- Design a database to save the dictionary information.
- Write a webserver code to identify users, track sessions and communicate with the clients.

What will you learn?

The student will have a great opportunity to learn the new standards and technologies of web-based application. The student also can learn how to write a web server code that responds efficiently to the client requests. If the responsive web has been done properly, there is also an opportunity for the student to learn how to convert the web app into a mobile app directly without any significant change of the code.

Project Title: Object Recognition Using Convolutional Neural Network

Project Supervisor: *Assistant Lecturer Mohammed A. Taha*

Synopses:

This project aims to recognize objects and features by using Convolutional Neural Network. A network will be trained from scratch by using an image dataset. Then the network will be used by test images to see the accuracy of the network. Matlab contains many functions and library for this aim.

Expected Student Background:

- Basic Knowledge of Matlab.
- Basic Knowledge of Computer Vision Concepts.

What will you learn?

It will be a good chance to learn computer vision concepts using matlab. After this project you will have a good base for your future academic life.

Project Title: Semantic Web Technology Search Engine

Project Supervisor: *Assistant Lecturer Mohammed A. Taha*

Synopses:

This project aims to store images and videos using Semantic Web Rules. An Ontology will be created and then a web page which searches through images and videos. There should be a web page which search and store images.

Expected Student Background:

- Good programming background.
- Should have knowledge one of the server-side programming languages for example: php.

What will you learn?

It will be a good chance to learn semantic web technology concepts. Also, you will learn how to create protege for creating Ontology.

Project Title: Developing Human-Computer-Interactions (HCI) system

Project Supervisor: *Dr. Selcuk Cankurt*

Synopses:

Via this project students will develop an application for Human-Computer-Interactions (HCI). For this approach live video streaming will be used. Alternative the mouse and keyboard, by using hand gestures, users will be able to control the computer. This application requires to detect properly hand gesture.

Expected Student Background:

- Knowledge of Matlab.

Project Requirements:

- Students should obtain web and depth camera compatible with Matlab.

What will you learn?

By this project students will learn and develop an application which able to process digital images acquired from the depth and web camera. Students will understand that the skills what they have learned will be effectively used in daily life applications and problem solving. By the process of developing the project student can also experience how a project can be handled as a group project, in terms of; task distribution and following the tasks as a whole team.

Project Title: Developing Business Intelligence System

Project Supervisor: *Dr. Selcuk Cankurt*

Synopses:

Via this project students will develop a BI system with the implementation of the front-end application and back-end design of database management system, data warehouse, OLAP cubes and data mining techniques for a business which is selected on your wish.

Expected Student Background:

- Database systems and an OOP language like C#.

Project Requirements:

- Beside the technological needs, it is better if students have an idea about business logic of the selected topic.

What will you learn?

By this project students will learn and develop an application which contains advanced database concepts like data warehouse, OLAP cubes and data mining algorithms. Students will understand that the skills what they have learned will be effectively used in daily life applications and problem solving. By the process of developing the project student can also experience how a project can be handled as a group project, in terms of; task distribution and following the tasks as a whole team.

Project Title: Developing Traffic control system

Project Supervisor: *Dr. Selcuk Cankurt*

Synopses:

Via this project students will develop an application for Traffic control system. For this approach live video streaming will be used. This application need to detect properly cars to make analysis the traffic data.

Expected Student Background:

- Knowledge of Matlab, digital image processing.

Project Requirements:

- Students should obtain the IP camera compatible with Matlab and mobile control kid for IP camera.

What will you learn?

By this project students will learn and develop an application which able to process digital images. Students will understand that the skills what they have learned will be effectively used in daily life applications and problem solving. By the process of developing the project student can also experience how a project can be handled as a group project, in terms of; task distribution and following the tasks as a whole team.

Project Title: Developing an interface to analysis the android sensor data

Project Supervisor: *Dr. Selcuk Cankurt*

Synopses:

Via this project students will develop an application to acquire and analysis the data obtained from an Android sensor.

Expected Student Background:

- Knowledge of Matlab.

Project Requirements:

- Students should obtain an Android telephone and Matlab software.

What will you learn?

By this project students will learn and develop an application which able to acquire data from the sensors on android mobile phone and analysis them in Matlab. Students will understand that the skills what they have learned will be effectively used in daily life applications and problem solving. By the process of developing the project student can also experience how a project can be handled as a group project, in terms of; task distribution and following the tasks as a whole team.

Project Title: Developing an interface to collect and analyze data using Matlab and raspberry Pi.

Project Supervisor: *Dr. Selcuk Cankurt*

Synopses:

Via this project students will develop an application to acquire and analyze data from sensors and imaging devices connected to your Raspberry Pi by using Matlab. Students will learn how to acquire video from the Camera Board connected to your Raspberry Pi to detect faces using Raspberry Pi and Matlab, and acquire and visualize data from a temperature sensor and accelerometer connected to your Raspberry Pi.

Expected Student Background:

- Matlab.

Project Requirements:

- Students should obtain the Raspberry Pi.

What will you learn?

By this project students will learn how to acquire video from the Camera Board connected to your Raspberry Pi to detect faces using Raspberry Pi and Matlab, and acquire and visualize data from a temperature sensor and accelerometer connected to your Raspberry Pi. Beside of working in a group projects, students will learn how to merge different assets into one application

Project Title: Design self-balance robot using Arduino

Project Supervisor: *Dr. Goran Abdulrahman*

Synopses:

The project aim is to learn the students how to design drawing machine using Arduino, besides programming it. The Arduino drawing machine can print pictures or print text on wall, panel or A4 paper. Therefore, the main aim of this project is to draw large diagrams efficiently.

Expected Student Background:

• Good programming background is recommended.

• Basic knowledge in sensors and actuators

Project Requirements:

- Arduino
- Motors
- Sensors (e.g. Gyro MPU6050)
- H-Bridge L298N
- Power supply

What will you learn?

The project aim is to learn the students how to integrate sensors and actuators with Arduino, besides programming it.

Project Title: Design X Y Drawing Machine using Arduino

Project Supervisor: *Dr. Goran Abdulrahman*

Synopses:

The project aim is to learn the students how to design drawing machine using Arduino, besides programming it. The Arduino drawing machine can print pictures or print text on wall, panel or A4 paper. Therefore, the main aim of this project is to draw large diagrams efficiently.

Expected Student Background:
• Good programming background is recommended.
• Basic knowledge in sensors and actuators

Project Requirements:
 • Arduino
• Motors (e.g. servo motor and stepper motor).
• Motors Driver
• Power supply

What will you learn?

The project aim is to learn the students how to design drawing machine using Arduino, besides programming it.