University *of* Alexandria
Faculty of Engineering
Division of Communications & Electronics

Subject Name: Microprocessors and Interfacing **Lecturer:** Dr. Nayera Sadek

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Hardware Projects

Instructions to Students

- Students are working in groups (at most 5).
- Each project can be reserved by 5 groups only.
- The projects will be reserved as First-Reserve-First-Get
- The requirement is to use the ESP32 Kit to implement your project.
- The bonus is to develop a mobile App associated with your project.

The Procedures for submission:

1. **Writing a report**

The report should have the following main sections:

- Hardware Project Title
- Names and ID of the team members.
- Aim of the hardware project.
- List of the used components
- Schematic of the circuit implemented.
- Procedure to use this circuit.
- Budget of the project.
- Challenges that the team had and how to overcome them.
- References.

The software report should include the code, the screenshots of the output(s).
The report can include extra section(s) useful to support the project from the team's point of view. It should be submitted in PDF format. The file name is "group number_project name"

2. **Making and uploading Video**

Every team records about 10-min video to:

- Show the main parts of the hardware project.
- Run the hardware project, test it and show the results.

The video should be uploaded to youtube, google drive or any other drive so it can be accessed.

3. **Report and Video Link Submission:**

A form will be announced to upload the report and the link of the video.

4. **Project Discussion:**

The project will be discussed as a team .
On the discussion day, every team should bring:

- The hardware and be ready to demonstrate it.
- Hardcopy of the report submitted .

Project Suggestion

Students in each group can choose from the following list or suggest their own project.

1- RGB strip control using mobile phone
2- Weather condition alarm system
3- Up-down counter (7-segment led display)
4- Automatic Hand Sanitizer Dispenser with COVID19 Live Updates
5- Zigzag and Circular path Autonomous Moving Robot
6- First In First Out Queueing
7- Control Servo Moto
8- Temperature and Humidity Sensor display
9- Internet clock with LCD display
10- Programming ESP8266 to display alphanumeric characters on Seven Segment Display
11- Obstacle avoiding car using IR sensor
12- Capacitive Soil Moisture sensor
13- Safe Lock Password Mechanism
14- Safe distance maintaining moving car
15- ESP32 GPS Tracker- IoT based Vehicle Tracking System
16- Control LEDs Brightness
17- Smart car parking
18- Motion detection with notification
19- Water tank detector
20- Smart door lock and lighting system

The following are useful links to get more information about the projects:

https://www.seeedstudio.com/blog/2021/02/02/fun-esp32-projects-you-need-to-try/
https://randomnerdtutorials.com/projects-esp32/
https://iotdesignpro.com/esp32-projects