Course Project
DeVry University
College of Engineering and Information Sciences

Course Number: CEIS 114

Background
The Internet of Things (IoT) is growing exponentially. New technologies and applications are being developed on a regular basis and this creates an abundance of new job opportunities each with its requisite skill sets. It is important to stay current with the skills required for this evolving job market and to take advantage of the many available learning opportunities currently available.

This course project covers the fundamental concept of the IoT by integrating hardware, software, and networks into a whole system. The project focuses on the development of an IoT device to simulate a multiple traffic controller system utilizing ESP32 Microcontroller, Web and a Smart Sensor. The design and development process of the device includes planning, hardware setup, programming, and networking. It encompasses many aspects of IoT and prepare you for your future career in technology. The expectations for the final course project are below.

Scenario
Design and develop a two-way traffic light controller with an option for pedestrian crossing. Secure the system so that it could be controlled remotely via a web browser. Integrate a SMART Sensor to trigger signal changes based on traffic flow.

Expectations for Final Deliverable

To submit your final project, assemble all your previous project submissions into one professionally designed presentation including your final project component (Option 1 or Option 2). Review your previous module submissions and enhance any areas that could be improved when compiling the final project. The presentation should explain your project in detail and illustrate to any employer your competence as a technology expert.

From each module's submissions, include all screenshots, pictures, and explanation slides. In addition, develop slides to transition and explain each stage of the development process and customize your presentation to reflect a professional appearance. You also need to include an introduction slide, conclusion slide, challenges in the project slide, and career skills obtained slide. You should have around 28 – 35 slides

Final Submission
After you develop your final project presentation, create your Wix site and upload your final project to your site. Next, submit your final project through the Assignments page, and also copy the link from your published Wix site and include the link in the comments. Once you upload this and other projects to Wix.com, you can showcase your projects to potential employers. This is a great way to demonstrate the skill you have obtained from the projects. Refer to the grading rubric below to ensure you incorporate the essential elements into your project.
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CEIS114 Final Project Rubric

AITN Outcome: Design solutions for well-defined technology problems and assist with design of systems, components, or processes appropriate to disciplines such as Information Technology, Information Systems, and or Automation and Controls System.							
Performance	**Fail**	**Poor**	**Fair**	**Good**	**Excellent**	**Points Awarded**	**Total Points**
Points	**0**	**3**	**5**	**7**	**10**		**10**
Identification: *Identify resources needed to build a smart traffic controller.*	Project materials were not inventoried, and no picture was included.	Project materials were inventoried, no picture was included, but explanation was present.	Project materials were inventoried, and picture was included. Pieces were unorganized, and all parts were included.	Project materials were inventoried, and picture was included. Pieces were organized, but not all parts were included.	Project materials were inventoried, and picture was included. All components were organized, and all parts were included.		
AITN Outcome: Communicate effectively in written, oral, and graphical forms using various media and directed to variety of audiences.							
Performance	**Fail**	**Poor**	**Fair**	**Good**	**Excellent**	**Points Awarded**	**Total Points**
Points	**0**	**5**	**10**	**15**	**20**		**20**
Demonstration: *Demonstrate communication skills in various environments and contexts.*	No slides were presented.	Title slide was present. No introduction slide, challenges in the project slide, career skills slide, link for portfolio slide, or conclusion slide.	Title slide was present. More than one of the following slides were missing: introduction slide, challenges in the project slide, career skills slide, link for portfolio slide, or conclusion slide.	Title slide was present. Only one of the following slides were missing: introduction slide, challenges in the project slide, career skills slide, link for portfolio slide, or conclusion slide.	Title slide, introduction slide, challenges in the project slide, career skills slide, Link for portfolio, and conclusion slide were all presented.		
AITN Outcome: Communicate effectively in written, oral, and graphical forms using various media and directed to variety of audiences							
Performance	**Fail**	**Poor**	**Fair**	**Good**	**Excellent**	**Points Awarded**	**Total Points**
Points	**0**	**3**	**5**	**7**	**10**		**10**
Demonstration: *Utilize resources to build portfolio appropriate for evolving job market in the digitized world.*	No link to portfolio was submitted.	Link to portfolio was submitted but final project was not uploaded to website.	Link to portfolio was submitted with final project uploaded to website. Portfolio does not contain any relevant information.	Link to portfolio was submitted with final project uploaded to website. Portfolio contains little relevant information.	Link to portfolio was submitted with final project uploaded to website. Portfolio includes relevant information.		

AITN Outcome: Apply principles of technology in the building, testing, operation, and maintenance of IoT-based systems.							
Performance	**Fail**	**Poor**	**Fair**	**Good**	**Excellent**	**Points Awarded**	**Total Points**
Points	**0**	**5**	**10**	**15**	**20**		**20**
Testing: *Test a system utilizing principles of technology.*	No system was tested.	System was partially built and not properly coded in Arduino IDE. Serial Monitor screenshot was not submitted.	System was partially built and partially coded in Arduino IDE. Serial Monitor screenshot was submitted with no messages.	System was built and partially coded in Arduino IDE. Serial Monitor screenshot was submitted with minimal errors.	System was built, coded, and tested in Arduino IDE. Serial Monitor screenshot was submitted with no errors displaying Don't Walk and Walk, messages.		
AITN Outcome: Apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined technology problems appropriate to disciplines such as Information Technology, Information Systems, and or Automation and Controls Systems.							
Performance	**Fail**	**Poor**	**Fair**	**Good**	**Excellent**	**Points Awarded**	**Total Points**
Points	**0**	**5**	**10**	**15**	**20**		**20**
Building: *Build a smart traffic light controller utilizing principles of technology.*	No system was built using principles of technology	System was built using principles of technology with frequent errors. Most of parts were missing except for the following: 1. Two sets of Traffic Lights	System was built using principles of technology with occasional errors. Some parts were missing except for the following: 1. Two sets of Traffic Lights 2. Push Button	System was built using principles of technology with minimal errors. All of the parts were included except final component: 1. Two sets of Traffic Lights 2. Push Button 3. LCD Panel 4. Buzzer	System was built using principles of technology with no errors. All of the parts were included: 1. Two sets of Traffic Lights 2. Push Button 3. LCD Panel 4. Buzzer 5. Motion Detector or Cayenne Push Button		

AITN Outcome: Conduct, analyze, and interpret results of standard tests, measurements, and/or experimentation relevant to the field.							
Performance	**Fail**	**Poor**	**Fair**	**Good**	**Excellent**	**Points Awarded**	**Total Points**
Points	**0**	**5**	**10**	**15**	**20**		**20**
Operating: *Operate a smart traffic light controller utilizing principles of technology.*	Project was not operational.	Project was operating with frequent errors. Final Component was not included.	Project was operating with occasional errors. Both sets of lights, Crosswalk Button, and LCD panel were operational. Final project component was included with errors.	Project was operating with minimal errors with either Option 1 or Option 2. Final project component was included.	Project was operating with no errors. All of the components were functional including the final project component.		