UNIVERSITY OF CENTRAL LANCASHIRE

SCHOOL OF ENGINEERING

ASSESSMENT 1

Name ……

ID ……...

MODULE CODE: **ER4706**

MODULE TITLE: **Applied Instrumentation**

MODULE TUTOR: **Dr. Ahmed Onsy**

SEMESTER 2, 2020/21

Submission Date and Time:

11:59 pm, 8th May 2021

Venue/Campus: **PRESTON CAMPUS**

Sensors, Instrumentation & Control, MP4706 – Assessment 1 2020/21

Instructions to Candidates:

Value

This assignment constitutes **50%** of the grade for this module.

Submission Date and Time:

11:59 pm, 8th May 2021

Submission Rules

The assignment should be your own work and written in your own words (1500 words + relevant material in Appendices). It will be checked for plagiarism using Turnitin. Any plagiarism or copying from others will be dealt with through the university's plagiarism procedures.

Your assignment must be submitted electronically via BlackBoard (Assignments tab) by the submission time. The report should be contained in a Word document, or PDF. No other means of submission will be accepted. The software code will be submitted independently.

Any assignment submitted late but within 5 working days of the deadline will be given a maximum mark of 50%. Assignments submitted more than 5 working days after the deadline will not be marked, and a mark of 0% will be recorded.

Learning Outcome to be assessed:

1	Demonstrate knowledge and critical understanding of sensors and transducers typically encountered in engineering applications
2	Understand critically the practical aspects of sensor use and type
3	Demonstrate knowledge and critical understanding of the principles of instrumentation and measurement systems
4	Demonstrate knowledge and critical understanding in the devise of an appropriate and effective strategy for processing data; virtual instrumentation and virtual simulation

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Task:

'Global-Technologies' is a system engineering company that develops systems to support a wide range of applications.

You have been asked as an engineer in the 'Global-Technologies' company, to design and develop a Smart Home System 'SHS'. The SHS usually includes several sub-systems such as renewable energy sub-system, security sub-system, lighting control sub-system, gate control sub-system and other sub-systems that you may include in your SHS design (see an example in Figure 1).

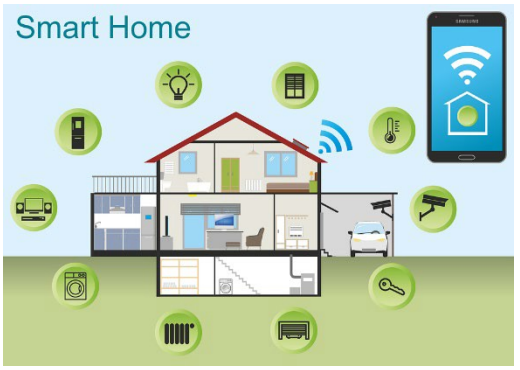

Figure 1: Smart Home Syb-systems Example
https://images.app.goo.gl/zzb3jeQQpp8cNxRJ7

Provide a detailed, professional report for your director that contains the following:

1- A review of different SHS and sub-systems including their main elements.

2- A design of a typical SHS system that incorporates at least two sub-systems. The system design should include DAQ/ microcontroller and any other required elements for SHS operation.

3- Select one of the subsystems discussed in (2) and develop a proof of concept.

4- Validate the operation of the subsystem developed in (3) and comment on the result.

5- Proposal for the next phases of development to include the following:

   A. Using of a low-cost controller instead of the current one

   B. Using industrial networks of data transmissions; wireless or wired data transmission and Internet of Things

Assessment Criteria

The Department's Principles of Assessment will be used to determine grading levels.

1	A review of different SHS and sub-systems including their main elements	20%
2	A design of a typical SHS system that incorporates at least two sub-systems. The system design should include DAQ/ microcontroller and any other required elements for SHS operation.	20%
3	Select one of the subsystems discussed in (2) and develop a proof of concept.	20%
4	Validate the operation of the subsystem developed in (3) and comment on the result.	10%
5 (A)	Proposal for the next phases of development to include the use of a low-cost controller instead of the current one.	10%
5 (B)	Proposal for the next phases of development to include the use of industrial networks of data transmissions; wireless or wired data transmission and Internet of Things.	10%
6	Report presentation, structure, clarify of information, use of references.	10%