

**Project: Individual IoT Application –70% of Module marks + 10% of Module Marks for Demo/PowerPoint Presentation.**

**Learning outcome:**

- Be able to design, develop and deploy an IoT Application.

IoT is ubiquitous in the technological automation of industry and consumer processes.

**Task:** You are required to design, develop and deploy a proof of concept IoT application using a Raspberry Pi and Python. You can design your own circuit using The Sense Hat or using other components e.g. thermistors, etc.

Your application must capture/record some data and transmit this data (as appropriate) over the internet to a client. The user (client) should be able to either control some aspect of the IoT application remotely or view the data in a meaningful way using an appropriate API. You can use any web server Apache, NGinx, Pi Plex, Firebase, Firestore, AWS, etc. Actuation is required.

**Deliverables**

1. IoT proposal **Tuesday 3/3/20 10 am** (using the Urkund link on Moodle)
2. **Newspaper Front Page Story (700 words max) Tuesday 31/3/20 5 pm** hardcopy and presentation
3. **IoT Application Demo and PowerPoint Presentation – Wednesday 22/4/20 9am.**
4. **Report (Word doc) (max 2500 words not including appendices) Friday 24/4/20 6pm** uploaded using the Urkund link on Moodle  
**Note:** References – if you quote a statistic in your report you should support it with an appropriate reference – use the Harvard Referencing System.  
 NB: if you use an online tutorial(s) for part of your assignment, you must reference it as a comment in your code and in your report.
5. **Full source Code** – upload compressed folder containing all source code including web server code etc. to Moodle **Friday 24/4/20 6pm** (Your project should include a ReadMe.txt file in the root folder detailing installation and any passwords etc. that are needed to demo your app. Include this detail as an appendix in your report)

**IoT Proposal (10% of marks)**

Your proposal should be a Word doc (max 2 pages) detailing:

1. **Title** of your IoT app, e.g. MyWeather Station / Robbie a home assistant etc.
2. IoT **category**, e.g. Home automation, health, agriculture, monitoring, etc.
3. **Description** – 1 sentence describing what your application does.
4. The **5 W's**, i.e. **who** would use your app, **where** would they use it, **why** would they use it, **when** would they use it, **what** would they use it for?  
 NB: this section should include references supporting the need (business case) for your application, e.g. if you are developing an IoT app for monitoring conditions in a residential greenhouse for growing tomatoes, I would expect you to include some statistics on growing tomatoes, i.e. what are the optimal growing conditions, what conditions are you monitoring – temperature, humidity, watering. I do not expect you to monitor all the conditions but which ones are you proposing to monitor initially etc.
5. The **System Architecture** of your app, e.g. Raspberry Pi, Sense Hat, detail of web server and any APIs you will plan to use

Your report should include references to all tutorials or other sources you have or will be using. (Don't forget to include your name, kNumber, programme (isd4/idm4/sd4))

### **Newspaper Front Page story**

You are required to:

- Prepare a front page news story based on the IoT application you are developing
- Images are allowed
- **700** words max
- Remember - you need to sell papers!
- **Sample new stories on Moodle**

### **Testing-Demo and PowerPoint Presentation**

~~Customer Acceptance Testing (CAT) will be scheduled week beginning 20/4/20. The schedule will be published on Moodle.~~

~~Students who do NOT attend scheduled customer testing will be awarded 0 (out of available 50) marks for project.~~

**You are now required to submit an online demo (you can record using a phone max 10 minutes) and a PowerPoint presentation (template online) where you talk me through your IoT application for Wednesday 22/4/20 9am. You may be asked to go through your presentation online through Microsoft Teams or by telephone on 23/4/20 or 24/4/20. 10% of the module marks will be for your demo and presentation. Your PowerPoint Presentation is a synopsis of your report.**

### **Your Final report should include**

- 1 Title of app/ IoT category (Health/Home Monitoring/etc.)
- 2 Description of your app (Scope your app appropriately – your app should do one thing well.)
- 3 Identification of Needs – the research you did for your proposal (The 5 W's - Who/Why/Where/When, What and How). Are there similar applications/devices? How is your application different? The way it is implemented- what it can do, etc.  
**NB: i.e. the Business Case for your app. You may wish to include a description of a "similar" successful app.**
- 4 System Architecture – Include a diagram and describe each component.
- 5 Implementation – Describe your implementation – (Full source code to be submitted online – if you have coded something noteworthy put it in your text (long pieces of code should go in an Appendix if relevant) (Appendix not part of word count)
- 6 Testing – detail any testing you did. This is a time-limited project so I am not expecting extensive testing. Basic testing is all that is required
- 7 Conclusions & Future Work (Data Analytics, etc.)

Should you fail to upload your work to Moodle before the deadline expires then your mark for the assignment will be subject to a penalty.

### Penalties Scale

<i><b>Days Late</b></i>	<i><b>Multiply mark by</b></i>
1-2	0.7
3-4	0.5
5-7	0.3

1. "Days" includes weekends and holidays.
2. Late submissions will only be accepted within a maximum of 7 days.
3. Penalties do not apply if there is a documented reason such as sickness or a bereavement etc.

### Sample Marking Scheme (\*Topic weighting may vary depending on application)

<b>Assignment Weighting</b>	<b>70% of final module mark</b>
<b>Topic</b>	<b>mark</b>
Proposal	10
Newspaper Front Page Story	10
*Data Sensor/Capture(Raspberry Pi + Sense Hat)	10
*Web Server (on Raspberry Pi and/or in the Cloud)	20
*Actuation (remotely turn on/off component on Raspberry Pi)	20
*Additional Feature (Data presentation/ Data Analytics etc.)	10
Report	20
	100
<b>+ Demo/Presentation</b>	<b>+ 10% of final module mark</b>

**This is an individual assignment.** Assignments that are copied or developed by someone else will receive zero marks and the plagiarism escalated as per LIT assessment regulations.

Issue Date 24/2/20

**Updated 25/3/20: update in RED COVID**