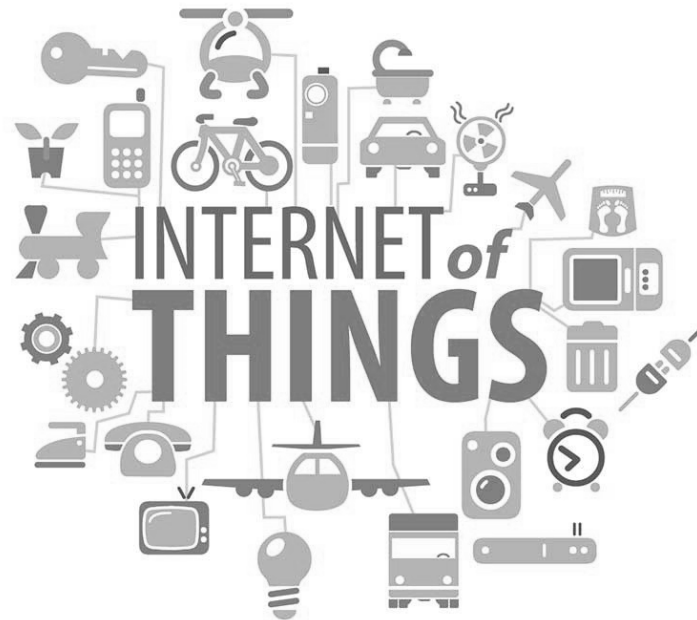


Module Overview

(Spring Semester)

CM2306: Communication Networks



Course Description

1

Applications and Use Cases

2

Architectures

3

Sensing and Actuation

4

Networking and Communications

5

Data Management and Analytics

6

Privacy and Security

7

Human Factors and Interaction

8

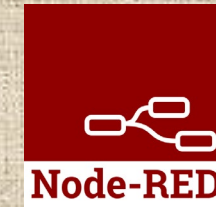
Design Strategies and Prototyping



RaspberryPi



Programming
(Labs and Self Study)



JavaScript



ThingsBoard

IBM **Watson IoT**
(Optional)

1

Applications and Use Cases

In this lesson, we talk about different types of IoT application and how they have impacted our lives and society broadly.

2

Architectures

In this lesson, we talk about architectural styles of IoT and their characteristics and trade offs. We also talk about the major components of IoT architectures.

3

Sensing and Actuation

In this lesson, we talk about different types of sensors and actuators. We also talk about characteristics and challenges of using different sensors and actuators.

4

Networking and Communications

In this lesson, we talk about different types of network communication protocols, their characteristics, trade-offs, and applications.

5

Data Management and Analytics

In this lesson, we talk about all about data. We will go through, what are the challenges in managing data in IoT and common techniques to analyze data.

6

Privacy and Security

In this lesson, we talk about privacy and security threats. We will also discuss common techniques used to mitigate those risks in IoT.

7

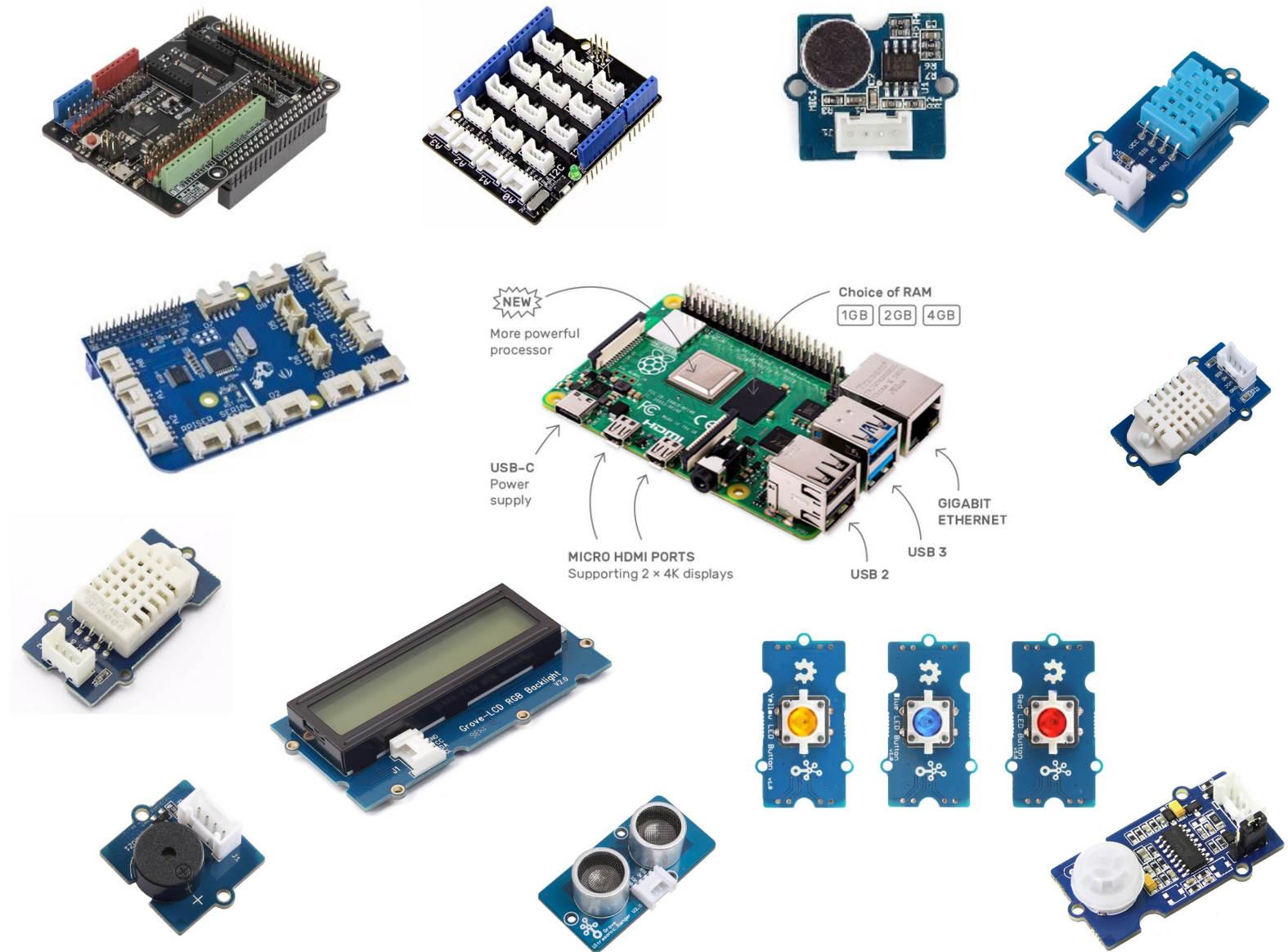
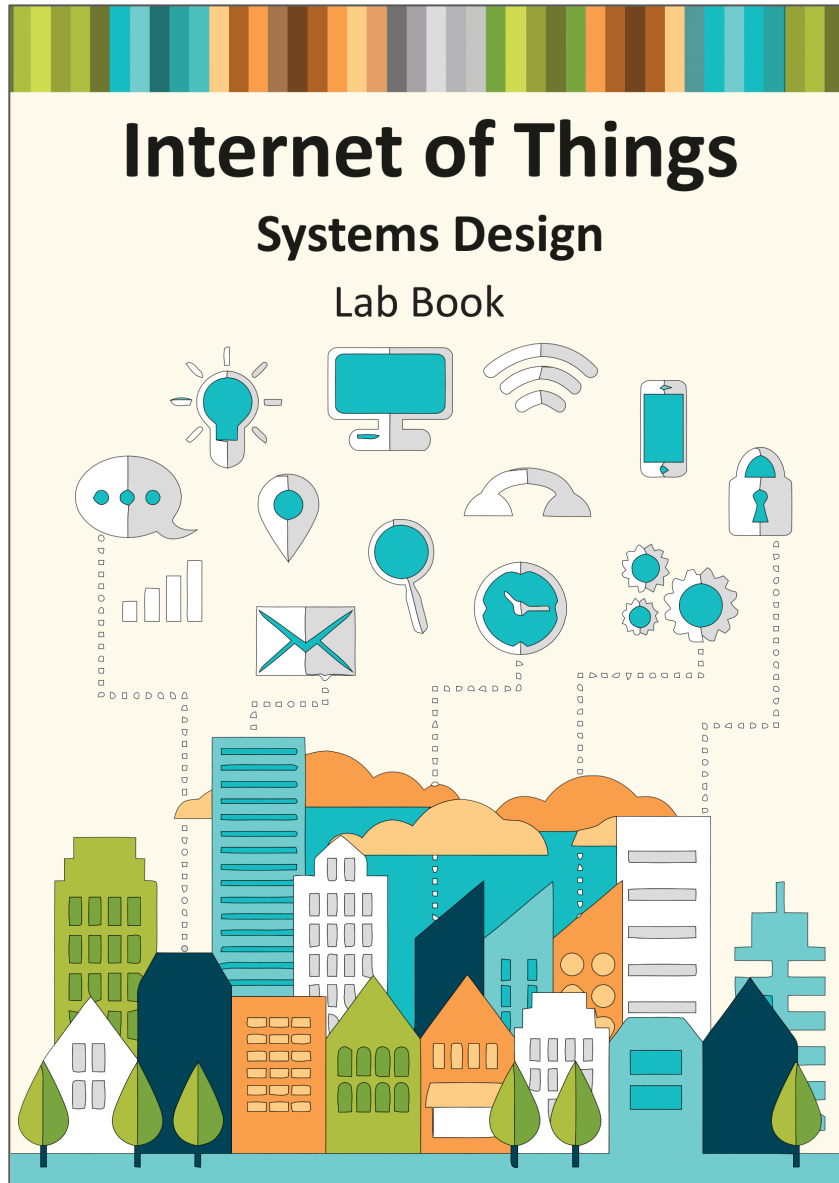
Human Factors and Interaction

In this lesson, we talk about why interaction design matters. We also talk about why context awareness (e.g., location, time) is so important in IoT.

8

Design Strategies and Prototyping

In this lesson, we talk about how everything you learn so far fits together. We will talk about different factors and trade-offs that needs to be considered when designing IoT systems



Timetable

Week No	Labs	Quiz	Theme
1		Q1	Intro + Applications and Use Cases
2		Q2	Architectures
3	L1	Q3	Sensing and Actuation
4	L2	Q4	Networking and Communications
5	L3	Q5	Data Management and Analytics
6	L4	Q6	Privacy and Security
6	L5	Q7	Human Factors and Interaction
8	L6	Q8	Design Strategies and Prototyping
9	L7		Dedicated to coursework
10			Dedicated to coursework
11			Dedicated to coursework
12			Dedicated to coursework

Week 7 is a reading / development week



Aim to complete the Coursework



Content Delivery



Recorded Lessons



Presentation Slides



Interactive Learning



Learning Central



Coursework Management



Microsoft Teams



Announcements and Advice



Email Replacement (Q & A)
(Contacting the Instructor)



Teaching Assistant Support



Additional Resources



Live Weekly Sessions
(Recording will be available to download via Microsoft Teams)

<https://support.office.com/en-gb/article/use-a-link-or-code-to-join-a-team-c957af50-df15-46e3-b5c4-067547b64548>

Coursework



Workload Type: Group Assignment – appx 8-10 students per group for BSc (Groups are same as Group Project Module)

Submission Type: Demo (3 minutes or less) + Code (link to GitLab repository) + Document (Filled the form provided)



Lessons/Lectures: Through series of lectures you should gain knowledge on different aspects on Internet of Things.

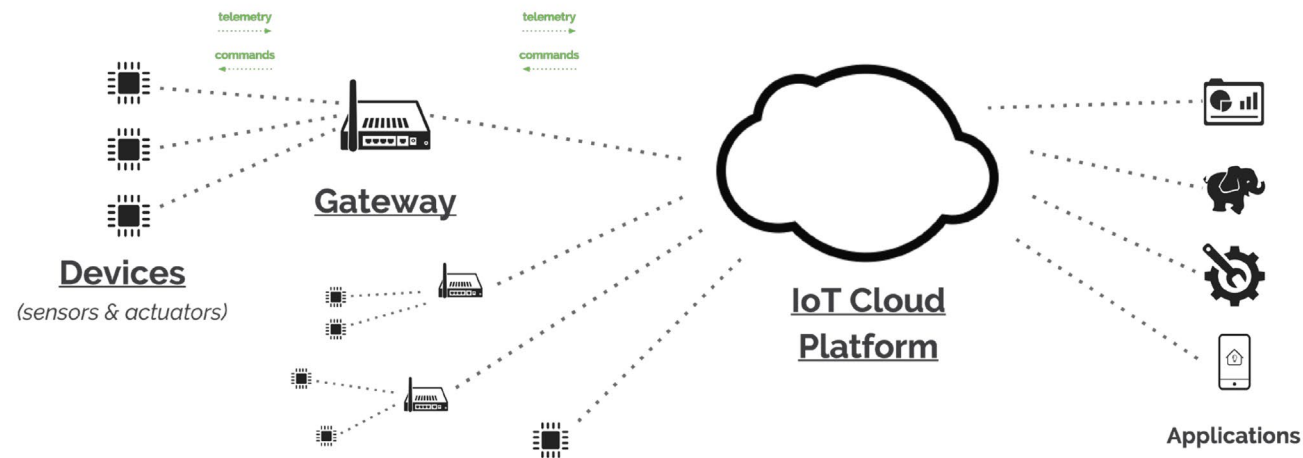
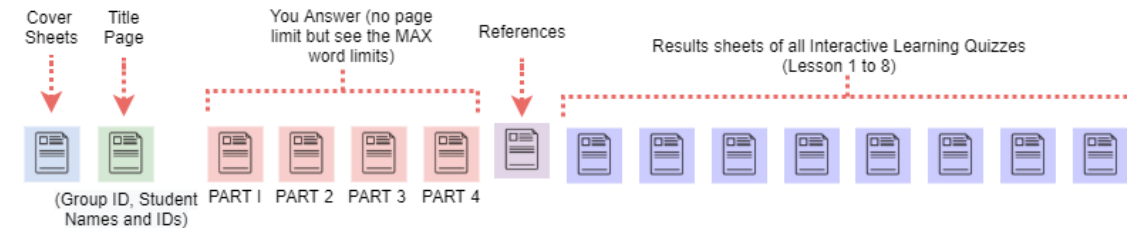


Labs Tutorials: Through series of lab tutorials, you should gain experience on full stack IoT application development process. During this process, you should and use different software and hardware components as well as IoT development tools and frameworks.



Your Task I (24 marks): Answer Interactive Questions and attach evidence.

Your Task II (76 marks): You need to collaboratively design and develop an end-to-end IoT application.



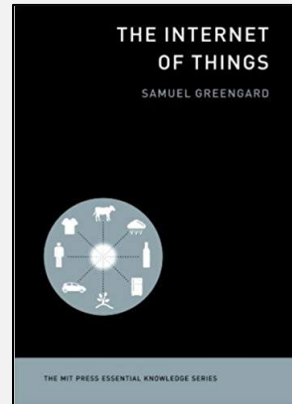
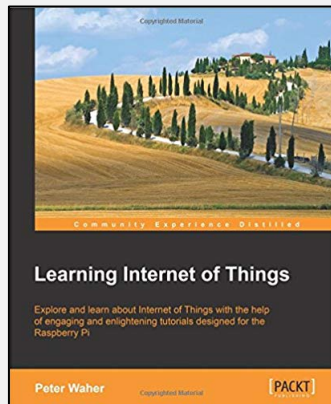
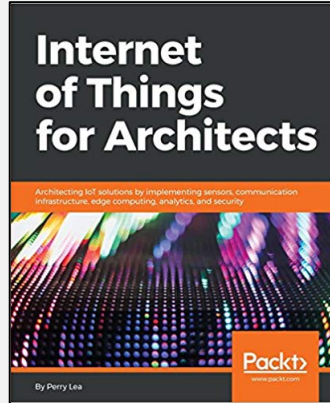
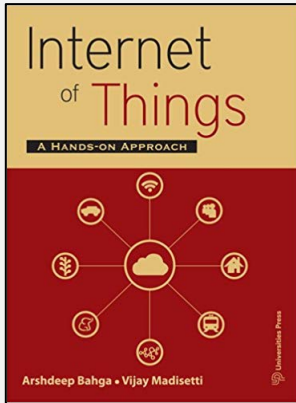
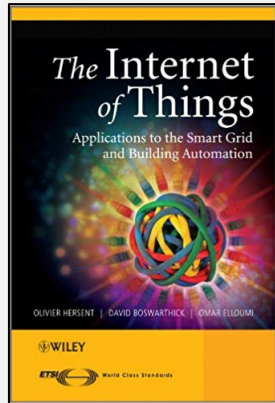
What We Expect from You

- Attend all lab sessions and engage with group members.
- Watch allocated lectures for that week before you come to the labs.
- Find time to work as a group and collaboratively complete weekly Quizzes (within that week – don't postpone)
 - Discuss, debate, engage with peers while answering the questions.
- Once you answer, make sure to download and share a copy with all members.
- During the labs, work as a group to complete the lab tutorials.
- During each week, get access to the IoT kit and complete the lab individually as well.
- Prepare the coursework documentation collectively (e.g., Shared Office 365 word document)
- Make a fair contribution to the coursework,
- The coursework is designed to finish by the end of **WEEK 10**.
 - Remaining **two weeks** are designed to act as a buffer/contingency
- From the workload point of view, this coursework can be completed within **10 weeks** individually (bare minimum)
 - Therefore, don't worry if other students drop out or don't contribute at all.
 - I will make sure you get fair marks and assess the submitted outputs (software and documentation) accordingly.
 - Working in a group could be sometimes more challenging than doing the work individually. However, when you go into the industry, you have to work with other people. You also don't get a choice on whom you can work with. Therefore, consider this is training for real-world jobs 😊
 - (Planning) Make sure to keep a shared log on who is expected to do what and when (e.g., Shared Office 365 word document)
 - This means all the group members know what they are expected to deliver when.
 - Discuss, negotiate and agree on deadlines on when to complete the tasks by whom
 - (Reality) Also, keep a record of who did what and when.
- I'm hoping to give the same mark to all group members.
 - However, I will make sure marks are given fairly depending on the contributions.
 - If there are significant differences between the group members in terms of commitment/contribution, I will adjust individual marks accordingly.

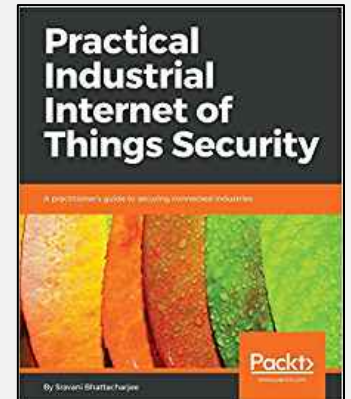
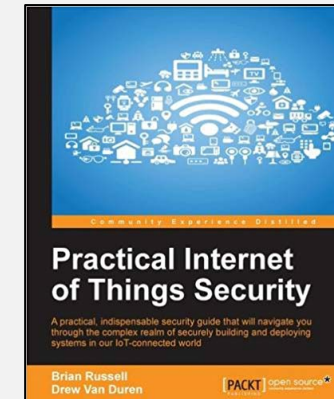
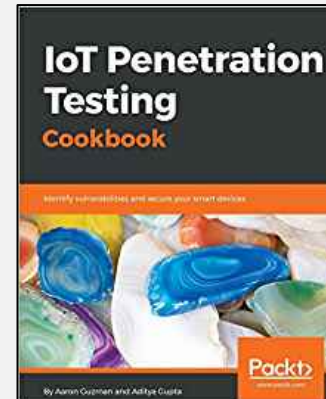
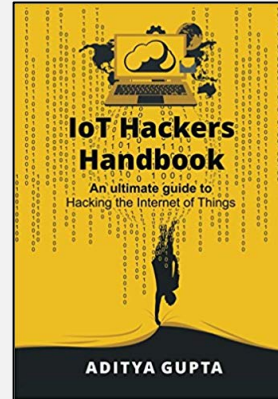


This group project is **time-limited** (like an exam), it can only be completed within the given time period - extensions are therefore unsuitable as a remedy for ECs and a first (uncapped) attempt at the next assessment opportunity (as an individual project/coursework) will be offered.

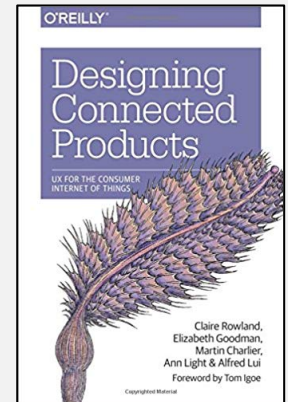
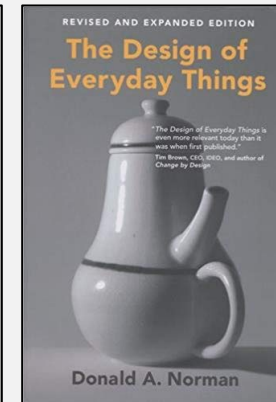
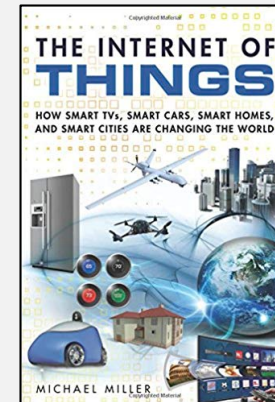
Recommended Readings and References - Books



Internet of Things: Architectural Overview



Internet of Things Security



Internet of Things: Design

**Only you
get out,
what you
put in.**

Try to go beyond the given labs



Q & A



gitlab.com/IOTGarage



twitter.com/IOTGarageNews



bit.ly/2JMoSd4



iotgarage.net



charithperera.net

