

ELEC0130 – Internet of Things (IoT) (previously referred to as ELECGT27)

Introduction to the course

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Lecturer (Teaching)

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University College London

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Ryan's Background



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- Engineering Doctorate (EngD) in Communications at UCL.
- Have worked in Engineering and FinTech companies.
- Research interests:
 - Signal processing for communications.
 - Software defined radio.
 - Internet of Things (IoT) including time-series analysis and IoT testbeds.
- Teaching:
 - MSc modules on the Internet of Things, Wireless Communications Principles, Mobile Communication Systems.
 - Undergraduate 3-module minor:
 - Connected Systems.
 - Networked Systems.
 - Internet of Things.
 - Undergraduate modules in Digital / Embedded Engineering Design.
- Enabling activities:
 - Academic Writing, PGTA Coordination.
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Agenda



- Course overview.
- Syllabus and learning outcomes.
- Tour of Moodle page for this module.

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Course Schedule



Academic Week	Date (Wed)	Week	Topic	Synchronous Activity
20	First week of Term 2	0	Preparation	-
21	20/01/2021	1	Course Introduction	11am-1pm
22	27/01/2021	2	Exploratory Data Analysis	11am-1pm
23	03/02/2021	3	Statistical and Machine Learning	11am-1pm
24	10/02/2021	4	Cloud Applications and Services	11am-1pm
25	-	Reading Week	-	-
26	24/02/2021	5	Sensors and Sensor Nodes	11am-1pm
27	03/03/2021	6	Connectivity and Networks	11am-1pm
28	10/03/2021	7	Tutorial - Project Review	11am-1pm
29	17/03/2021	8	Tutorial - Project Review	11am-1pm
30	Last week of Term 2	-	REPORT SUBMISSION	-

Method of Delivery and Assessment



- Individual project evaluated through an end-of-module report weighing towards 100% of the module grade.
 - Issued towards the middle of Term 2.
 - Coursework-based.
- Multiple formative activities each week and for each topic:
 - Pre-recorded lectures.
 - Quizzes.
 - Worked examples.
 - Practical exercises (using industry-standard software tools).
 - Discussion forums.
- Synchronous (online and live) sessions:
 - One two-hour slot per week (Wednesdays, 11am-1pm).
 - Will be interactive and require you to engage in discussion and debate.

Course Style



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AIM: Develop solid technical knowledge and skills required to build Internet of Things (IoT) systems.

- Highly interactive and hands-on course.
- You will need to complete a number of lab scripts which will involve system design, device programming, data analysis and cloud development.
- Connected Learning format.
 - Complete the designated activities for each week before attending the online, synchronous session.



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Course Syllabus (in a nutshell)



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- Layer 1: Sensors and sensor nodes
 - Sensing components and devices.
 - Sensor modules, nodes and systems.
- Layer 2: Connectivity and networks
 - Wireless technologies for the IoT.
 - Edge connectivity and protocols.
 - Wireless sensor networks.
- Layer 3: Analytics and applications
 - Signal processing, real-time and local analytics.
 - Databases, cloud analytics and applications.



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Course Learning Outcomes



- **Explain** the definition and usage of the term “Internet of Things” in different contexts.
- **Know** the key components that make up an IoT system.
- **Differentiate** between the levels of the IoT stack and be familiar with the key technologies and protocols employed at each layer of the stack.
- **Apply** the knowledge and skills acquired during the course to build and test a complete, working IoT system involving prototyping, programming and data analysis.
- **Understand** where the IoT concept fits within the broader ICT industry and possible future trends.
- **Appreciate** the role of big data, cloud computing and data analytics in a typical IoT system.

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