

WM380-15 Internet of Things

24/25

Department

WMG

Level

Undergraduate Level 2

Module leader

Mir Seyedebrahimi

Credit value

15

Module duration

11 weeks

Assessment

100% coursework

Study locations

University of Warwick main campus, Coventry Primary
Distance or Online Delivery

Description

Introductory description

This module introduces the concept, implementation and applications of digitally enabled objects that can transfer data over a network without requiring human-to-human or human-to-computer interaction in the context of Internet of Things (IoT). The potential of Internet of things (IoT) in smart homes/cities and industrial context will be introduced and corresponding system architectures, networking configurations and programming techniques will be taught to acquire and process data using hardware kits based on general wired/wireless network elements (e.g. switches, routers/gateways), microcontroller units (e.g. ARM microcontrollers, Arduino), single-board computers (e.g. raspberry pi), sensors and actuators.

[Module web page](#)

Module aims

This module examines the transformative world of interconnected technologies, empowering students to grasp the details of newly emerging technologies such as IoT, explore their strengths and analyse how they converge to drive innovation in diverse domains like smart cities, homes, and Industry 4.0. Students will also enhance their skills in designing and evaluating real-world IoT systems, preparing them to be an active player in shaping this exciting future.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- Introduction of IoT ecosystem and architecture
- IoT reference architecture
- IoT-enabled network elements
- Sensors and actuators
- Network architecture (carriers & services)
- Last mile wired/wireless connections
- Edge, Fog and IoT cloud platforms
- IoT-related Configurations and Lab Kits

Learning outcomes

By the end of the module, students should be able to:

- Explore and evaluate the impact of emerging digital technologies e.g., IoT, big data, cloud computing, data analytics. [AHEP:4 - C16] [CITP: 2.3.1]
- Assess where the IoT concept fits within various use cases such as smart cities/homes, the industry (Industry 4.0) and future trends. [AHEP:4 - C6, C8]
- Demonstrate various protocols used in IoT including the corresponding sense, actuation, and wireless technologies. [CITP: 2.1.2, 2.2.1]
- Design and justify an IoT system architecture, considering sensor/actuator integration, data processing, network selection, and organisational fit. [CITP: 2.1.10]

Indicative reading list

- D. N. Serpanos, "Internet of things (IoT) systems: architectures, algorithms and methodologies", Springer, 2018, ISBN : 9783319697154.
- M. De Saulles, "The internet of things and business", Routledge, 2017, ISBN: 9781315537849.
- J. Mongay Batalla, "Beyond the Internet of things; everything interconnected", Springer, 2017, ISBN: 9783319507583.
- R. R. Yager, "New advances in the Internet of things", Springer, 2018, ISBN: 9783319581903.

[View reading list on Talis Aspire](#)

Subject specific skills

Contributes to the occupational standard for Digital and Technology Solutions Professional (ST0119):

- Plan, design and manage simple computer networks with an overall focus on the services

and capabilities that network infrastructure solutions enable in an organisational context (S12).

- Monitor performance and ensure networks are configured correctly and perform as expected by designers or architects. Undertake capacity management and audit of IP addressing and hosted devices (S58).
- Research and evaluate emerging network technologies and assess relevance to current network requirements. Provide an objective opinion on how new features and technologies may be incorporated as required by the organisation (S62).

Transferable skills

Has the capabilities that enable living, learning and working in a digital society;
Engaged in Team working, Problem solving, Critical thinking and Digital literacy.

Study

Study time

Type	Required
Lectures	10 sessions of 1 hour (7%)
Seminars	10 sessions of 1 hour (7%)
Practical classes	10 sessions of 1 hour (7%)
Work-based learning	15 sessions of 1 hour (10%)
Online learning (independent)	5 sessions of 1 hour (3%)
Other activity	5 hours (3%)
Private study	35 hours (23%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

- Self-guided study: revision on module contents, solution of additional seminar-type questions, video tutorials, software exercises and supplementary materials.
- Study and advanced use of simulation software.
- Analysing datasheets of components.
- Teams/forum for discussing queries with course peers and tutor (asynchronous).

Other activity description

- Pre-module reading list given on Moodle to encourage flipped learning approach.
- Preparation for the practical lab.
- Online consulting session for providing one to one support to help struggling students.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A2

	Weighting	Study time	Eligible for self-certification
Project	100%	60 hours	Yes (extension)

This assessment is linked with the materials delivered in the module “Internet of Things” and:

- Assesses the student's competency for describing the fundamental building blocks of IoT systems and inter-relationships
- Examines student's ability for analysing, designing and developing the taught system
- Consolidates and expands the learning by utilising a wider range of resources and research

Feedback on assessment

Feedback given as appropriate to the assessment type:

- verbal feedback given during seminar/tutorial sessions
 - formative feedback on the individual contributions
 - written feedback on the final group reports
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Availability

Courses

This module is Core for:

- Year 2 of DWMS-H655 Undergraduate Digital and Technology Solutions (Cyber) (Degree Apprenticeship)
- Year 2 of DWMS-H652 Undergraduate Digital and Technology Solutions (Data Analytics) (Degree Apprenticeship)
- Year 2 of DWMS-H653 Undergraduate Digital and Technology Solutions (Network Engineering) (Degree Apprenticeship)
- Year 2 of DWMS-H654 Undergraduate Digital and Technology Solutions (Software Engineering) (Degree Apprenticeship)