

**Summary Information**

<b>Module Code</b>	5523USST
<b>Formal Module Title</b>	Local Communications Systems and Applications
<b>Owning School</b>	Engineering
<b>Career</b>	Undergraduate
<b>Credits</b>	20
<b>Academic level</b>	FHEQ Level 5
<b>Grading Schema</b>	40

**Module Contacts****Module Leader**

<b>Contact Name</b>	<b>Applies to all offerings</b>	<b>Offerings</b>
Dante Matellini	Yes	N/A

**Module Team Member**

<b>Contact Name</b>	<b>Applies to all offerings</b>	<b>Offerings</b>
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**Partner Module Team**

<b>Contact Name</b>	<b>Applies to all offerings</b>	<b>Offerings</b>
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**Teaching Responsibility**

<b>LJMU Schools involved in Delivery</b>
LJMU Partner Taught

## Partner Teaching Institution

Institution Name
University of Shanghai For Science and Technology

## Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	22

## Module Offering(s)

Offering Code	Location	Start Month	Duration
SEP-PAR	PAR	September	12 Weeks

## Aims and Outcomes

<b>Aims</b>	On completion students will be able to review the communications options available to interconnect hardware elements and justify a selection to resolve a problem.
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## Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Analyse communications requirements within and between hardware elements
MLO2	Review communications options
MLO3	Perform calculations relevant to communications
MLO4	Assess the suitability of communications options to address engineering problems

## Module Content

### Outline Syllabus

Communications media  
I2C, I3C, SPI  
Time Sensitive Networking (TSN)  
Internet of Things (IoT)  
Embedded sensor technology and applications  
Networking  
Wireless sensor networks  
SoC Microcontrollers with/without Wifi  
Power use and minimization  
Lightweight messaging protocols and servers  
Data volumes and data rates  
Security

### Module Overview

## Additional Information

The module will examine the movement of information and data between devices and systems.

## General Notes

### UNESCO Sustainable Development Goals

Affordable and Clean Energy  
Industry, Innovation and Infrastructure  
Sustainable Cities and Communities  
Climate Action  
Life on Land

### UK SPEC AHEP 4

#### CEng.

M1 Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering.

M2 Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed.

M3 Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.

M4 Select and critically evaluate technical literature and other sources of information to solve complex problems.

M6 Apply an integrated or systems approach to the solution of complex problems.

M10 Adopt a holistic and proportionate approach to the mitigation of security risks.

M13 Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.

#### IEng.

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

B10 Adopt a holistic and proportionate approach to the mitigation of security risks

B13 Select and apply appropriate materials, equipment, engineering technologies and processes.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Exam	Exam	70	2	MLO1, MLO2, MLO3
Practice	Practice	30	0	MLO4