

Short Title:	Information Transmission & Management APPROVED
Full Title:	Information Transmission & Management
Module Code:	MIOT H6012
ECTS credits:	10
NFQ Level:	9
Module Delivered in	2 programme(s)
Module Contributor:	David Powell
Module Description:	This module provides an overview of concepts and technologies used in the transmission and storage of information for modern IoT systems. It is intended to supplement the IoT embedded systems module by considering the higher level infrastructure that supports both “data concentration” and “store and forward” on IoT devices, and “data aggregation” in a large scale destination information repository in preparation for data analytics and other processes..
Learning Outcomes:	
<i>On successful completion of this module the learner will be able to</i>	
<ol style="list-style-type: none"> 1. Identify and analyse various aspects of data transmission and storage, the student will be able to apply the associated range of theoretical and practical considerations in the design of IoT systems. 2. Describe the operation of network protocols and why networking standards are critical element of the IoT. The student will acquire an in depth knowledge of the TCP/IP protocol, sockets and higher level protocols running over TCP/IP. 3. Demonstrate an understanding of a range of wireless networking technologies. 4. Identify and describe the benefits of different Client Server architectures for IoT systems. Identify how Message Oriented Middle-ware (MOM) has been adapted for distributed, resource-limited architectures. 5. Demonstrate through formal approaches how data can be represented, transmitted and stored in network communities that include resource limited devices. Appreciate how the integrity of data can be verified and data quality can be assessed. 6. Demonstrate an understanding of the different types of database technologies currently in use. Create suitable database structures to model real world entities and demonstrate how these can be queried. 	

Module Content & Assessment

Indicative Content
Networking principles and Technologies Layered Network models, TCP/IP Model, Data Sockets, Wireless Networking, higher level protocols running on TCP. Trouble shooting TCP/IP networks.
Distributed Systems Client / Server Architectures, MOM (message oriented middle-ware), MQTT, COAP, Web Services.
Data Storage and Representation Formal approaches for information modelling and representation of data . Describe the different methods for compression in audio, image and video. Resource limited storage and transmission of data.
Data Providence and Quality Verifying the integrity and quality of data.
Data Encryption and Compression Methods for reducing the volume / frequency of data transmission and storage. Mechanisms to ensure secure communications over unsecured communications links.
Database technologies NOSQL, Relational, Object Oriented and Object Relational Mappings. Connection to database systems using ODBC, JDBC and OLEDB

Indicative Assessment Breakdown	%
Course Work Assessment %	100.00%

Course Work Assessment %				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Written Report	Assignment to develop an IoT solution to communicate with a ReST Database and display data to a HTML web-page. This exercise will also examine Fundamental Networking knowledge and skills.	1,2	30.00	Week 6
Written Report	A project to develop an IoT solution based around MoM technology (COAP and MQTT). This assessment will also examine wireless networking technologies.	3,4,5	30.00	Week 9
Project	Mini project which provides template IoT solution, including information transmission and server back end.	4,6	40.00	Sem 1 End

No Final Exam Assessment %

Indicative Reassessment Requirement
Coursework Only <i>This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.</i>

ITB reserves the right to alter the nature and timings of assessment

Indicative Module Workload & Resources

Indicative Workload: Full Time	
Frequency	Indicative Average Weekly Learner Workload
Every Week	4.00
Every Week	4.00
Every Week	4.00
Every Week	2.00
Every Week	4.00
Every Week	4.00
Every Week	4.00
Every Week	4.00
Every Week	4.00
Every Week	4.00
Every Week	4.00

Resources
<i>Recommended Book Resources</i>
<p>Kevin Townsend, Carles Cufâi, Akiba, and Robert Davidson., <i>Getting started with Bluetooth low energy</i>, 1 Ed., 1-10, Sebastopol, CA; O'Reilly [ISBN: 9781491949511]</p> <p>Stephen Morris, Keeley Crockett, Peter Rob, Carlos Coronel 2013, <i>Database Principles: Fundamentals of Design, Implementations and Management</i>, 2nd Ed., Cengage Learning EMEA [ISBN: 9781408066362]</p>
<i>This module does not have any article/paper resources</i>
<i>This module does not have any other resources</i>

Module Delivered in

Programme Code	Programme	Semester	Delivery
BN_EMIOT_M	Master of Engineering in Internet of Things Technologies [BN535M 30 credits taught with a 60 credit research project]	1	Mandatory
BN_EMIOT_R	Master of Engineering in Internet of Things Technologies [BN535R 60 credits taught with a 30 credit research project]	1	Mandatory