

Module Details	
Module Title	Concurrent and Distributed Systems
Module Code	COS6012-B
Academic Year	2021/2
Credits	20
School	Department of Computer Science
FHEQ Level	FHEQ Level 6

Contact Hours	
Type	Hours
Lectures	12
Laboratories	24
Directed Study	164

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims
To introduce the nature and applications of concurrent programming with typical problems requiring synchronisation of, and communication between, concurrent processes; to introduce a variety of language primitives for inter-process communication and synchronisation, and to illustrate their applications.

Outline Syllabus
Introduction to concurrency. Processes and threads; mutual exclusion; synchronisation. Synchronisation in Java. Monitors and semaphores; Java synchronisation utilities. Deadlock; safety and liveness properties. Testing concurrent programs. Introduction to distributed systems. Message passing interface. MPI communication models; Open MPI and OpenStack. Cloud resource management and simulation.

Learning Outcomes	
Outcome Number	Description
01	Demonstrate a sound knowledge and understanding of the construction of concurrent and distributed systems.
02	Model, construct and analyse concurrent and distributed systems.
03	Demonstrate an analytical approach to the construction of software.

Learning, Teaching and Assessment Strategy
The delivery of the module will consist of online lectures and lab classes supplemented by directed study. The first coursework will focus on theoretical, analytical and implementation aspects in the construction of concurrent systems. The second coursework will involve modelling and implementing a distributed system. Students requiring supplementary assessment will conduct similar assessment to the original.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Artefact	Report and implementation (modelling and implementing a concurrent system)	50%
Summative	Coursework - Artefact	Report and implementation (theoretical and practical aspects in the construction of distributed systems)	50%

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.