MODULE **DESCRIPTOR**

MODULE TITLE	DISTRIBUTED SYSTEMS		
MODULE CODE	CO4101 (L7)	CREDIT VALUE	20 UK CREDITS / 10 ECTS
SCHOOL	SCHOOL OF SCIENCES		

MODULE **AIMS**

1. Apply techniques and conduct activities involved in the design and implementation of distributed systems using distributed algorithms.
2. Introduce different distributed systems' interaction theories (e.g., interprocess communication, remote invocation, and indirect communication)
3. Introduce information on the role, contribution and support provided by the operating system in distributed systems
4. Distinguish between different types of middleware concepts and select appropriate middleware to fulfil the design requirements of a distributed system

MODULE **CONTENT**

Indicative syllabus content:

Introduction to distributed systems applications and examples of such systems leading to deriving and identifying the characteristics of a distributed system. Presentation and discussion of various architectural models of distributed systems along with interprocess communication and operating systems support.

Address the various objects and components that constitute a distributed system, as well as web services and name services. Peer-to-peer systems, distributed file systems and multimedia systems will also be addressed.

Discussion on transaction processing, addressing time and global states and transaction data replication. Exploitation of the differences between conventional distributed systems and mobile and ubiquitous computing systems

INTENDED **LEARNING OUTCOMES**

On successful completion of this module a student will be able to:

1. Differentiate and discuss different concepts of distributed systems including design, architecture, organisation and algorithms.
2. Critically discuss the role and contribution of the operating system towards communication and support in distributed systems.
3. Critically discuss peer-to-peer systems, distributed objects and component based concepts. Explore key problems with peer-to-peer systems and the reasons and transition requirements that led to component based approaches in distributed object middleware.
4. Identify and explain the different name services and basic design issues such as the structure and management of the space of names.
5. Analyse the design requirements for the implementation of a distributed system and accordingly, select an appropriate distributed algorithm and middleware.

TEACHING METHODS

The module will be delivered as a set of lectures and workshops. The lectures will introduce the theoretical content of the module the fundamental concepts of distributed systems, including the selection of the appropriate distributed algorithms, middleware that fulfils the design criteria of a distributed system, naming structures and interprocess communication used for distributed systems.

The workshops will expose students to the various design characteristics of distributed systems through a series of case studies. Discussions and directed reading in applying appropriate distributed systems concepts will also be used to help students appreciate these systems through the analysis of case studies. As this is a skills based course, the assessment is both focused on knowledge content and skills. The content component of the module is mainly assessed in the module examination, whereas the skills and practical understanding of the module content is assessed in the coursework component. Therefore, the coursework assessment component for this module requires that students do work in between taught classes and that this is reviewed before the examination component of the assessment – to that end the students can get feedback on the coursework assessment to contribute to their preparation for the examination assessment component.

ASSESSMENT METHODS

This module is assessed through an examination and a report.