Distributed Systems DCOMP217

MODULE DETAILS

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Course Location	:	Freetown, Sierra Leone
Department	:	Faculty of Information and Communication Technology
Program Name	:	B.Sc (Hons) in Information Technology
Credits	:	3
Status	:	Major
Contact hours	:	4 hours (2 hours lecture + 2 hours Tutorial)
No. of weeks	:	14 teaching weeks + 1 Final examination week + 1 week Midterm Break
Teaching Pattern	:	Lecture + Tutorial
Pre-requisite	:	DCOMP 337 Database Systems
No. of assignments	:	2 Assignments
Lecturer's Name	:	Mr. Owen Collins Cole & Mr. Santigie Kamara
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Prepared by : Donaldson Jones

Signature : .... Date ....

Approved by : AQA

Signature : .... Date ....

Verified by : Oluwatosin Ayorinde

Signature : .... Date ....
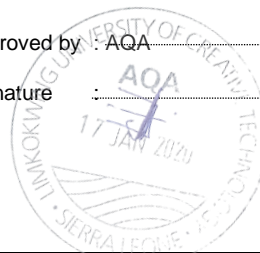
This document comprises the following:

- Essential Information
- Specific Module Information
- Module Rules & Regulations
- Grades
- Plagiarism
- Module Introduction
- Module Aims & Objectives
- Learning Outcome
- Specific Generic Learning Skills
- Syllabus + Lecture Outline
- References
- Assessment Schedule
- Assessment Criteria
- Specific Criteria

Other documents as follows will be issued to you on an ongoing basis throughout the semester:

- Handouts for Assignments
- Submission Requirements + Guidelines

1.0   ESSENTIAL INFORMATION

- All modules other than electives are **'significant modules'**

- As an indicator of workload one credit carries and additional 2 hours of self study per week. For example, a module worth 3 credits require that the student spends an additional 6 hours per week, either reading, completing the assignment or doing self directed research for that module.

- Submission of ALL assignment work is compulsory in this module. A student cannot pass this module without having to submit ALL assignment work by the due date or an approved extension of that date.

- All assignments are to be handed on time on the due date. Students will be penalised 10 percent for the first day and 5 percent per day thereafter for late submission (a weekend or a public holiday counts as one day). Late submission, after the date Board of Studies meeting will not be accepted.

- Due dates, compulsory assignment requirements and submission requirements may only be altered with the consent of the majority of students enrolled in this module at the beginning/early in the program.

- Extensions of time for submission of assignment work may be granted if the application for extension is accompanied by a medical certificate.

- Overseas travel is not an acceptable reason for seeking a change in the examination schedule.

- Only the Head of School can grant approval for extension of submission beyond the assignment deadline.

- Re-submission of work can only receive a 50% maximum pass rate.

- Supplementary exams can only be granted if the level of work is satisfactory **AND** the semester work has been completed.

- Harvard referencing and plagiarism policy will apply on all written assignments.

2.0   SPECIFIC MODULE INFORMATION

- Attendance rate of 80% is mandatory for passing module.

- All grades are subject to attendance and participation.

- Absenteeism at any scheduled presentations will result in zero mark for that presentation.

- Visual presentation work in drawn and model form must be the original work of the student.

- The attached semester program is subject to change at short notice.

3.0   MODULE RULES AND REGULATIONS:

Assessment procedure:

- These rules and regulations are to be read in conjunction with the UNIT AIMS AND OBJECTIVES

- All assignments/projects must be completed and presented for marking by the due date.

- Marks will be deducted for late work and invalid reasons.

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- All assignments must be delivered by the student in person to the lecturer concerned. No other lecturer is allowed to accept students' assignments.

- All tests/examinations are compulsory.

- Students must sit the test/examination on the notified date.

- Students are expected to familiarize themselves with the test/examination timetable.

- Students who miss a test/examination will not be allowed to pass.

- Any scheduling of tutorials, both during or after lecture hours, is TOTALLY the responsibility of each student. Appointments are to be proposed, arranged, confirmed, and kept, by each student. Failure to do so in a professional manner may result in penalty of grades. Tutorials WITHOUT appointments will also NOT be entertained.

- Note that every assignment is given an ample time frame for completion. This, together with advanced information pertaining deadlines gives you NO EXCUSE not to submit assignments on time.

4.0   GRADES

All modules and assessable projects will be graded according to the following system. With respect to those units that are designated 'Approved for Pass/Fail' the grade will be either PA or F:

Grade	Numeric Grade	Description
90 – 100	A+	
85 – 89	A	Pass with Distinction
80 – 84	A-	
75 – 79	B+	
74 – 70	B	Pass with Credit
65 – 69	B-	
60 – 64	C+	
55 – 59	C	Pass
50 – 54	C-, PX, PC	
0 – 49	F	Fail

EXP	Exempted
PC	Pass Conceded
PP	Pass Provisional with extra work needed
PX	Pass after extra work is given and passed
X	Ineligible for assessment due to unsatisfactory attendance
D	Deferred
W	Withdraw
DNA	Did Not Attend Module
DNC	Did Not Complete Module

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5.0 PLAGIARISM, COPYRIGHT, PATENTS, OWNERSHIP OF WORK: STUDENT MAJOR PROJECT, THESES & WORKS

See LIMKOKWING, HIGH FLYERS HANDOUT, pg 10.

6.0 MODULE INTRODUCTION

With the huge advances in the price/performance ratio of computer hardware and with the proliferation of high speed networks, several attempts have been made at creating a truly distributed operating system to enable a new generation of computing applications that take full advantage of the new technologies. Such system would federate multiple distributed resources into a single image and allow users and applications access to these resources in a location-transparent manner. The topics covered in this course include: fundamentals of distributed systems, communication model, naming, fault-tolerance, caching and replication.

7.0 MODULE AIMS AND OBJECTIVES

- Students should learn the basic terminology and technologies of Distributed Systems

- Students should learn the basic problems of a distributed design and communication

- Students should have an understanding of the fundamental issues in distributed computing sufficient to form a sound basis for the design and implementations of distributed systems

- Students should be aware of the problems and pitfalls relating to the correctness of distributed systems and have insight into the main techniques for attacking them

8.0 LEARNING OUTCOME

Acquire professional skills in creating and handling a distributed system

9.0 SPECIFIC GENERIC LEARNING SKILLS

Upon completion of the module, student will be able to identify and understand the following:

- Technology and principles of Distributed systems

- Identify problems and counter them in distributed systems

- Have a good knowledge on the design and implementation of distributed systems

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10.0 UNIT SYLLABUS + LECTURE OUTLINE:

Week: 1

LECTURE 1:   **CHARACTERIZATION OF DISTRIBUTED SYSTEMS**

Lecture Synopsis: *Introduction, Examples, Key Characteristics and Historical Background*

Handout: *Module outline, Chapter 1 PowerPoint handouts*

Week: 2

LECTURE 2:   **ARCHITECTURAL MODELS**

Lecture Synopsis: *Building blocks, Client – Server communication and Group Communication*

Handout: *Chapter 2 PowerPoint handouts*
Due Date: *Assignment 1*

Week: 3

LECTURE 3:   **REMOTE METHOD INVOCATION**

Lecture Synopsis: *Middleware, Local Object vs Remote Object, Remote Method Invocation*

Handout: *Chapter 3 PowerPoint handouts and Assignment 1*

Week: 4

LECTURE 4:   **REMOTE METHOD INVOCATION**

Lecture Synopsis: *Interface, Naming , Binding, RMI Stub & skeleton, RMI Class*

Handout: *Chapter 4 PowerPoint handouts*
Due Date: *Major Assignment*

Week: 5

LECTURE 5:   **DISTRIBUTED OPERATING SYSTEMS**

Lecture Synopsis: *The Kernel, Processes and threads*

Handout: *Chapter 5 PowerPoint handouts*

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Week:	6	

LECTURE 6:   **DISTRIBUTED OPERATING SYSTEM**

Lecture Synopsis: *Naming and Protection, Communication and invocation, virtual memory*

Handout: *Chapter 6 PowerPoint handouts*

Week:	7:	**MID-TERM EXAMINATION**

Week:	8	**SEMESTER BREAK**

Week:	9	

LECTURE 7:   **CONCURRENCY CONTROL /DISTRIBUTED TRANSACTION**

Lecture Synopsis: *Locks, Optimistic Concurrency Control, Timestamp Ordering, and Comparison of methods for concurrency control.*
Simple distributions and nested transactions, atomic commit protocols, concurrency control in distributed transactions, distributed deadlocks, transactions with replicated data.

Handout: *Chapter 7 PowerPoint handout*

Week:	10	

LECTURE 8:   **RECOVERY AND FAULT TOLERANCE**

Lecture Synopsis: *Transaction Recovery*

Handout: *Chapter 8 PowerPoint handouts*

Week:	11	

LECTURE 9:   **TRANSACTION AND FAULT TOLERANCE**

Lecture Synopsis: *Fault Tolerance, Hierarchical and group masking of faults*

Handout: *Chapter 9 PowerPoint handouts*

Week:	12	

LECTURE 10 & 11:   **DISTRIBUTED OPERATING SYSTEMS: CASE STUDIES**

Lecture Synopsis: *Mach, chorus, Unix emulation in Mach and Chorus*

Amoeba, A comparison of Mach, Amoeba and chorus, Clouds , Firefly RPC and the

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Amoeba multicast protocol

Handout: *Chapter PowerPoint handouts and Submission of Major project*

Week: 13

Major Project Presentation
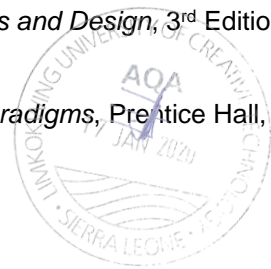
Week: 14
FINAL EXAMINATION WEEK

Week: 15

FINAL EXAMINATION WEEK

11.0 REFERENCES

Coulouris G., Dollimore J., Kindberg T., *Distributed Systems: Concepts and Design*, 3rd Edition, Addison – Wesley, 2001

Tanenbaum A., Van Steen M., *Distributed Systems: Principles and Paradigms*, Prentice Hall, 2002

12.0 ASSESSMENT SCHEDULE

ASSIGNMENT DESCRIPTION	ISSUE DATE	DUE DATE	%
ASSIGNMENT 1	WEEK 2	WEEK 4	10%
MAJOR PROJECT	WEEK 4	WEEK 13	25%
MID-TERM EXAMINATION :	WEEK 7	WEEK 7	20%
FINAL EXAMINATION :	WEEK 14	WEEK 14	40%
ATTENDANCE	WEEK 1	WEEK 14	5%
TOTAL			**100%**

13.0 ASSESSMENT CRITERIA

Process of grading and criteria used to determine the grades, passes and high distinctions.

14.0 SPECIFIC CRITERIA

- Each assignment will be handed out with the project brief and will vary, depending on the teaching and learning objectives of the specific assignment.

- Each student will receive a completed assessment sheet back with their marks, thereby giving student feedback on each set criterion and the project as a whole.

- Marks for each project will be posted on the Bulletin Board with student number within 2 weeks of hand-in date.