COURSE TITLE	**:-**	**Algorithm Analysis and Design**			
COURSE CODE	**:-**	DSAL3001			
LEVEL	**:-**	Undergraduate/Bachelors	**CREDIT POINTS**	**:-**	3
Parent Programme	**:-**	B.A.Sc. in Computer Engineering			
Type of Course	**:-**	**Lectures**			
Date Validated	**:-**		**Date Modified**	**:-**	

TOTAL STUDENT WORKLOAD: *72 hours*

The normal weekly workload will be:

e.g.	*Lecture*	*3 hrs.*
	Tutorial	*2 hrs.*
	Directed and independent study	*3 hrs.*

PREREQUISITES:

1) **DSAL2001 – Data Structures**

DESCRIPTION:

This course provides knowledge and understanding of the advance concepts in the Design and Analysis of Algorithms. Students are provided with a more in-depth study of the performance and efficiency of algorithms. Solutions are expressed using Java with a strong emphasis on proper programme design. Topics include Memorization, Greedy algorithms, Dynamic Programming, Divide and conquer techniques etc.

LEARNING OUTCOMES:

On successful completion of this module the student would be able to:

Cognitive Domain:

Knowledge and Understanding

1. Use big O, omega, and theta notation to give asymptotic upper, lower, and tight bounds on time and space complexity of algorithms Identify data structures useful to represent specific types of information and discuss the tradeoffs among the different possibilities.
2. Determine the time complexity of simple algorithms.

Application and Analysis

3. apply mathematical, scientific, and engineering principles, tools and techniques to address a specific technical issue.
4. Apply efficient algorithmic solutions to solve problems.

Synthesis and Evaluation

5. evaluate the performance of various algorithms using the brute-force, greedy, and divide-and-conquer strategies, etc.
6. synthesize an efficient algorithmic solution to solve a technical problem.

AREAS OF STUDY:

The areas of study will be governed by the specific projects undertaken, but these will be drawn from the disciplines of information and communications technology.

LEARNING AND TEACHING STRATEGY:

The course relies on classroom discussion, participation, and case analysis. Students are expected to interact within their community and be able to work effectively in teams, and be active participants in classroom discussions and exercises. Each student is also expected to maintain a weekly reflective blog dealing with a current issue in his/her life. At the end of this course students are expected to build both hard and soft skills in the areas of Management and Leadership.

ASSESSMENT:

Assessment Element 1	**(Learning Outcomes 1, 2)**
weighting:	35%
assessment type:	Assignment
special facilities:	e.g. none
time/duration:	e.g. 6 weeks

Assessment Element 2	**(Learning Outcomes 2, 3, 4)**
weighting:	15%
assessment type:	Midterm Exam
special facilities:	Closed Book Exam
time/duration:	3 hours

Assessment Element 3	**(Learning Outcomes 3, 4, 5, 6)**
weighting:	50%
assessment type:	Final Exam
special facilities:	Closed Book Exam – Invigilated
time/duration:	3 hours

ASSESSMENT STRATEGY

This is a Must Pass (MP) course. The student must pass the final assessment in order to pass the course. The assessment process is designed to provide the student with regular formative (through marked and unmarked class exercises that are formally and informally reviewed and practice sets distributed to the students) and summative feedback from the course instructor. During the course, small group sessions are implemented for discussion.

Aggregation & Re-assessment Rules

The two main assessment instruments for this course, i.e. the coursework and the final assessment, are aggregated to form a single overall course mark. The final grading follows from the UTT regulations.

INDICATIVE READING:

1. M. H. Alsuwaiyel, **Algorithms Design Techniques and Analysis**, *World Scientific*
2. Additional course readings, videos and handouts will be provided

CONTACT INFORMATION:

Course Author	:-	Computer Engineering Programmes
Date	:-	2014
Course Instructor	:-	Laurice Phillips
Contact Information	:-	Email: laurice.phillips@utt.edu.tt Ph.: 642-8888 ext. 32266
Availability times in office	:-	4 hours per week *(also available by appointment)*