DEPT. OF COMPUTER SCIENCE & ENGINEERING
Faculty of Engineering, University of Moratuwa

CS3063 Theory of Computing (2 credits)

Semester 4, 21 Intake (Jan – May 2024)

Prerequisite(s):	CS2022 Data Structures & Algorithms
Class Contact:	Initially: Thursdays 08.15 – 10.15am,
Staff:	Sanath Jayasena (sanath@cse.mrt.ac.lk)
Assistance:	Charitha Rathnayaka, Dilith Jayakody and others
Course at LMS:	https://online.uom.lk/course/view.php?id=22898

1. Objectives & Learning Outcomes

Objective is to gain understanding of the abstract models of computation and formal language approach to computation.

After completing this course module, the students will be able to:

- Explain various models of computation
- Use tools and mathematical techniques for analyzing these models
- Use the formal language framework with models of computation
- Explain a Turing machine, its importance as the most general model of computation
- Explain the concepts of unsolvable and intractable problems

2. Texts and References

- **Main text**: *Introduction to Languages and the Theory of Computation* by John Martin, 3rd Edition, Tata-McGraw-Hill, 2003

3. Assessment

The distribution of marks for the assessed components of this course are as follows:

Continuous Assessments		30%
In-Class Quizzes	14%	
2 Assignments (8% each)	16%	
~~Mid-semester Test~~	~~10%~~	
Final Exam		70%

4. Rules and Regulations

All students are expected to actively participate in class and all activities. Poor performance in attendance and/or in assigned course work can be grounds for failure in the course. You are expected to write your answers yourself in assignments, quizzes and exams. Plagiarism, copying another person's work, letting another person copy your work, giving or receiving aid during any test, quiz or examination are all strictly not allowed. Any student caught in any of these will receive a failing grade regardless of marks earned on other assessed work.

Each assignment will have a deadline for submission. For each late day beyond a deadline, 10% of marks will be deducted. Details of submission will be given with each assignment. Submissions will usually be electronically to Moodle, unless otherwise instructed.

All students must check the Moodle site regularly for announcements and updates. You can post questions on subject matter or administrative matters related to this course. You are encouraged to post messages and carry-on discussions on relevant topics. If you think you can respond to a query of another student, please do so in an appropriate manner. All students must observe proper 'netiquette' when using Moodle.

5. Course Outline

1. Introduction - (1 lecture)
2. Regular Languages and Finite Automata - (4 lectures)
3. Context-free Languages and Pushdown Automata - (3 lectures)
4. Lexical Analysis and Parsing in Compilers – (1 lecture)
5. Turing Machines and Their Languages – (3 lectures)
6. Decidability; Unsolvable and Intractable Problems – (2 lectures)

6. Schedule

Week #	Week	Activity
1	22 – 26 Jan	No Lecture (25th Jan was holiday)
2	29 Jan – 02 Feb	L1 (Lecture 1), L2
3	05 – 09 Feb	L3, Quiz 1
4	12 – 16 Feb	L4, Quiz 2, Assignment 1 out
5	19 – 23 Feb	L5, Quiz 3
6	26 Feb – 01 Mar	L6, Quiz 4
7	04 – 08 Mar	L7, Quiz 5, Assignment 1 due
8	11 – 15 Mar	L8, Quiz 6,
9	18 – 22 Mar	L9, Quiz 7, Assignment 2 out
10	25 – 29 Mar	L10, Quiz 8
11	01 – 05 Apr	L11, Quiz 9
	06 – 21 Apr	New Year Break
12	22 – 26 Apr	L12, Quiz 10, Assignment 2 due
13	29 Apr – 03 May	L13, Quiz 11
14	06 – 10 May	L14, Quiz 12
	20 – 31 May	Final Exams