

Basic Information

Faculty

Dr. Nafees Mansoor
 Assistant Professor, Department of Computer Science and Engineering
 University of Liberal Arts Bangladesh (ULAB)

Hours

Class Hours: 11:30 – 13:00 (Sun/Tues)
 Counseling Hours: 13:30 – 14:30 (Sun/Tues)
 Note: Also available by appointment at other hours (e.g. email)

Contact Details

nafees.mansoor@ulab.edu.bd, Office: Room 315 (PC)

Course Pre-requisites

CSE 201

Dept. offering the course

Department of Computer Science and Engineering

Course Title

Automata and Theory of Computation

Course Code

CSE417	Credit	03	Term	Spring 2020
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Number of Lectures

24	Number of Tutorials	0	Total	24
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Course Details

1. Course Description

This course will familiar the students with the concepts of Automata and theory of Computation and they will learn how to use these concepts in application level. At the end of the class, we expect students be able to analyze and develop solutions triggered by real world's problems.

2. Course Objective

1. To **provide** a thorough understanding of Automata concepts and the resource requirements.
2. To **introduce** several important features of computational theory that are interesting both from a theoretical and also practical point of view.
3. To **enable** students in designing and solving problems using state machines.
4. To **emphasize** on various languages for designing and solving practical problems.
5. To **expose** the students on solving real world problems using relevant features of automata and formal languages approaches.

3. Intended learning outcomes of the course (ILOs)

1. Describe the principles and concept of automata along with its benefits.
2. Explain features of state machines to design and develop solutions
3. Solve a wide range of practical problems for automata and formal languages.
4. Understand a real-life problem and be able to design the solution using automata.
5. Design and develop solutions to real-life problems.

4. Mapping of Course LO and PLO:

Learning Outcome (LO) of the Course	Program Learning Outcome (PLO)											
	1	2	3	4	5	6	7	8	9	10	11	12
ILO 1	MJ	MN										
ILO 2	MN	MJ	MJ		MN							
ILO 3	MJ	MJ	MJ	MJ	MN							
ILO 4		MJ	MJ	MN	MN							
ILO 5	MJ	MJ	MJ	MJ	MJ	MJ				MJ		

5. Contents

ILO	Topic	Teaching Strategy	Assessment Strategy	Number of Sessions
1-2	Introduction to Automata and Theory of Computation	Lecture Exercise	Q/A Assignment	4
1-3	Finite State Machines	Lecture Exercise	Q/A	6
1-3	Regular Expressions	Lecture Exercise	Q/A	3
1-5	Context Free Grammar	Lecture Exercise	Q/A Assignment	5
1-5	Push Down Automata	Lecture Exercise	Q/A	2
1-5	Turing Machine & Decidability	Lecture Exercise	Q/A Assignment	4
			Total	24

6. A. Assessment Schedule

Assessment 1	Quiz	Session	TBA
Assessment 2	Assignment	Session	TBA
Assessment 3	Mid Term	Session	As per ULAB Schedule
Assessment 4	Presentation	Session	TBA
Assessment 5	Final	Session	As per ULAB Schedule

B. Weights of Assessments

Assessments	%
Mid-term Examination	20
Final Term Examination	50
Class Participation	10
Assignments	10
Quiz	10
Total	100

C. Grading Policy

Grade	Marks		Grade	Marks
A+	95-100		B-	65-69
A	85-94		C+	60-64
A-	80-84		C	55-59
B+	75-79		D	50-54
B	70-74			

7. List of References

Essential Books (Text Books)	Introduction to the theory of computation (second edition) by Michael Sipser, International Edition
Recommended Reference Books	Introduction to automata theory, languages, and computation (Third Edition) by John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman
Online Resources	Related online resources will be provided in the class.

Facilities Required for Teaching and Learning

Projector, Whiteboard, computer with internet connection.

Course Policies and Procedures

- ULAB regulations will be followed in conducting exams and evaluating answer scripts and grading.
- Failing to attend 6 or more classes will result in an automatic fail.
- Mid-term and final examinations will be held according ULAB schedules
- Students are advised to be in the classroom on time.
- All special emails are required to be sent to cse417.nafm@gmail.com.
- Cheating and plagiarism will result in an automatic mark of zero in the assessment item.
- Quizzes will be conducted as surprise quiz. Thus, students are advised to attain class regularly.
- There will be No Makeup Exam.
- Any cellular phone based activity is strictly prohibited in the class. Students are advised to keep their phones into silent mode while at the class.

Appendix-1: Program Learning Outcome (PLO)

No.	PLO
1.	Engineering Knowledge
2.	Problem Analysis
3.	Design/Development of Solutions
4.	Investigation
5.	Modern Tool Usage
6.	The Engineer and Society
7.	Environment and Sustainability
8.	Ethics
9.	Communication
10.	Individual and Team Work
11.	Life Long Learning
12.	Project Management and Finance

Generic Skills (Detailed):

1. **Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems;
2. **Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
3. **Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
4. **Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5. **Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
6. **The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices.
7. **Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development;
8. **Ethics (ESSE)** –Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices.
9. **Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
10. **Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
11. **Life Long Learning (S)** -Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
12. **Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one's own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.

Course Instructor

Date:

Head of the Department

Date: