

Basic Information

Faculty	Satyaki Das, (Room PC-315)							
Office Hour	Sunday: 9:15 am – 10:00am & 1:30 pm – 4:30 pm (Permanent Campus: Room: PC-315) Tuesday: 9:15 am – 10:00am & 1:30 pm – 4:30 pm (Permanent Campus: Room: PC-315) Monday: 9:15 am – 12:30 pm (Permanent Campus: Room: PC-315) Wednesday: 9:15 am – 12:30 pm (Permanent Campus: Room: PC-315) Thursday: 9:30 am – 12:30 pm (Permanent Campus: Room: PC-315) Note: Also available by Email Appointment at other times satyaki.das@ulab.edu.bd							
Contact Details	Room: PC315 satyaki.das@ulab.edu.bd							
Course Pre-requisites	CSE 201							
Department offering the course	Computer Science and Engineering							
Course Title	Automata and Theory of Computation							
Course Type	Core Course							
Course Code	CSE417		Sec	2	Credit	03	Term	Summer 2020
Number of Lectures	24	Number of Tutorials		0	Number of Practical	0	Total	24

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
ILO1	MJ	MN										
ILO2	MN	MJ	MJ		MN							
ILO3	MJ	MJ	MJ	MJ	MN							
ILO4		MJ	MJ	MN	MN							
ILO5	MJ	MJ	MJ	MJ	MJ	MJ				MJ		

5. Contents

ILO	Topic	Teaching Strategy	Assessment Strategy of Los	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. Alignment of topics of the courses with CLOs

This is already included as ILO

7. A. Assessment Schedule

Assessment 1	Quizzes	Session	TBA
Assessment 2	Assignments	Session	TBA
Assessment 3	Presentation	Session	As per ULAB Schedule
Assessment 4	Mid-Term Exam	Session	TBA
Assessment 5	Final Exam	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

Policy	Letter Grade	Grade Point
95% and above	A+	4.00
85% to below 94%	A	4.00
80% to below 84%	A-	3.80
75% to below 79%	B+	3.30
70% to below 74%	B	3.00
65% to below 69%	B-	2.80
60% to below 64%	C+	2.50
55% to below 59%	C	2.20
50% to below 54%	D	1.50
below 50%	F	0.00
--	I	0.00
--	W	0.00
--	AW	0.00

8. Make-up Procedures

ULAB guidelines will be followed for the makeup of the Midterm and Final Examination.

9. 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.
- 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.
- 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 Coordinator/ Teacher

Date: 09.07.2020

Head of the Department

Date: