Course-Plan

School	**Engineering**
Department	**Computer Science and Engineering**
Course Code	**CO 205 / CS 424**
Course Name	**Formal Language and Automata**
Instructor	**Shyamanta M Hazarika**

Abstract

Automata and formal languages appear (possibly in various disguises) in almost every branch of Computer Science. This course will give an introduction to formal languages and automata theory.

Objectives

Discuss how to define infinite language in a finite way.

- Algorithm that can decide whether a string is in the language or not.
- Practical importance: for constructing compilers and design of programming languages.

Introduce the basics of the theory of computability.

- Show that there exist uncomputable functions and some tasks are unsolvable (i.e. no algorithm exists).

Prerequisites of the course

None

No previous training (in Maths or Comp Sc.) prepares one for the types of reasoning skills required!

Lesson Plan

Topic	Lectures
Alphabets Languages Grammars	06
Finite automata Regular expressions Regular languages	12
Context free languages Pushdown Automata	04

Context sensitive languages Linear Bound Automata.	04
Turing machines Recursively Enumerable Languages	04
Formal Languages and Properties	04
Decision Questions on Languages Undecidable Questions	02
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Evaluation

I	25
II	25
Major I	40
III	25
IV	25
Term-End Exam	60
Total	**200**

Pedagogy

Teaching-learning methods to be used
Lecture and Discussion
Presentations

Expected outcome

– Understanding the notion of effective computability
– Emphasize the engineering applications of the theory developed
– Getting students to appreciate the central issues by semiformal intuitive reasoning
– Develop the ability to apply the ideas and proof techniques in varied environments

Text Book

1. Introduction to Automata Theory, Languages and Computation
   John E Hopcroft , Matwani & Jeffery D. Ullman
2. Introduction to Languages and the Theory of Computation
   John C. Martin
3. Elements of the Theory of Computation
   Lewis & Papadimitriou