TKM COLLEGE OF ARTS & SCIENCE, KOLLAM

DEPARTMENT OF MATHEMATICS

FORMAL LANGUAGES AND AUTOMATA THEORY

SYLLABUS

Instructional hours per week: 2 Total hrs: 30

Module 1

Sets, Relation and functions, Graph theory preliminaries. Strings, Alphabets, Languages, Operations. (5 hrs)

Module 2

Central concepts of Automata, Equivalence between DFA and NFA, Regu lar expression, Finite state automata, DFA, NFA, -NFA, Pumping lemma, Push down automata. Regular languages and regular grammar, Context free grammar. (15 hrs)

Module 3

Turing machine, definition and example, Programming techniques for tur ing machine, Combining turing machine, turing machine variants, Universal turing machine. (10 hrs)

Text books:

1. Peter Linz : An introduction to formal languages and automata, Fifth edition, Jones and Bartlett learning.
2. J.E. Hopcroft, R. Motwani and J.D. Ullman : Introduction to automata theory, languages and computation, 2001, Addison Wesley.

References:

1. Mishra and Chandrasekharan:Theory of computer Science and

Automata languages and computation, Second edition, PHI.

2.John C. Martin : Introduction to languages and theory of computation, TMH.

3.D.Goswami and K.D.Krishna: Formal languages and automata theory, Lec ture notes, 2010.

Outline of the Course :

This course is introductory in nature. Students with mathematical back ground in higher secondary level can pursue this course. It serves as a step ping stone to automata theory .

Targeted Audience :

Final year students of any discipline having mathematical background.

Prerequisites :

Sets , Relations, Functions, Mathematical Logic, Graph theory.

Learning outcomes :

At the end of this course, student will be able to

- ➢ Recall the concept of set, relation and functions, Preliminaries of Graph Theory
- ➢ Describe the idea of automata theory.
- ➢ Apply finite automata and regular languages.
- ➢ Distinguishes between automation and

computability. ➢ Analyze the concept of turing

machine.

➢ Demonstrates the programming techniques for turing

machine. 2

Instructional Methods :

➢ Lecture/Tutorial

➢ Peer teaching in form of seminars.

➢ Accessing web sources in terms of videos and tutorial notes.

Mode of Assessment :

➢ Quiz based on the topic 30

➢ Online/Written test at the end of the course 50

➢ Assignment/Seminar 20