Details of Minor Courses
Department of Electrical Engineering and Information Technology

I. Course Title : Big Data Analytics

II. Course Code : CSE 501

III. Credit Hours : 2+1

IV. Aim of the course

To understand principles of analyzing and mining big data and to use simple tools to extract useful information from big data sets.

V. Theory

Unit I

Data analysis, data matrix attributes. Data: Algebraic and geometric view, probabilistic view.

Unit II

Basics of data mining and CRISP-DM, organizational and data understanding, purposes, Intents and limitations of data mining, database, data warehouse, data mart and data set, types of data, privacy and security, data preparation, collation and data scrubbing.

Unit III

Data mining models and methods, correlation, association rules, k-means, clustering understanding of concept, preparation and modelling.

Unit IV

Discriminant analysis, linear regression, logistic regression, understanding, preparation and modeling.

Unit V

Decision trees, neural networks, understanding, preparation and modeling.

VI. Practical

Introduction to OpenOffice and RapidMiner in data analytics and mining. Preparing RapidMiner, Importing data, handling missing data, data reduction, handling Inconsistent data, attribute reduction. Performing different analysis using RapidMiner or suitable software.

VII. Learning outcome

Capability to understand the principles behind analysis of big data and apply the same using simple tools.

VIII. Lecture Schedule

S.No.	Topic	No. of Lectures
1.	Data analysis, data matrix attributes	2
2.	Algebraic and geometric view, probabilistic view.	4

S.No.	Topic	No. of Lectures
3.	Basics of data mining and CRISP-DM	2
4.	Organizational and data understanding	3
5.	Intents and limitations of data mining, database, data warehouse, data mart and data set	4
6.	Types of data, privacy and security, data preparation, collation and data scrubbing.	4
7.	Data mining models and methods, correlation, association rules	6
8.	K-means, clustering understanding of concept, preparation and modelling.	5
9.	Discriminant analysis, linear regression, logistic regression, understanding, preparation and modeling.	5
10.	Decision trees, neural networks, understanding, preparation and modeling.	5
	Total	**40**

IX. List of Practicals

S.No.	Topic	No. of Practicals
1.	Working of OpenOffice and RapidMiner	3
2.	Preparing RapidMiner Dataset	3
3.	Handling the inconsistent data, missing data, attribute reduction	4
4.	Performing analysis on dataset using RapidMiner	3
	Total	**13**

X. Suggested Reading

- Dr Matthew *North Data Mining for the Masses A Global Text Project Book* ISBN: 0615684378ISBN-13: 978-0615684376.
- Mohammed J Z, Troy and Wagner M Jr. *Data Mining and Analysis: Fundamental Concepts and Algorithms*. Universidade Federal de Minas Gerais, Brazil. Cambridge University Press ISBN 978-0-521-76633-3 Hardback.

I. Course Title : Artificial Intelligence

II. Course Code : CSE 502

III. Credit Hours : 2+1

IV. Aim of the course

To introduce students with techniques and capabilities of artificial intelligence (AI) and enable them to do simple exercises.

V. Theory

Unit I

Definitions of intelligence and artificial intelligence. What is involved in intelligence? Disciplines important to AI. History of development of AI. Different types of AI. Acting humanly, Turing test. AI systems in everyday life. Applications of AI.

Unit II

Classical AI, concept of expert system, conflict resolution, multiple rules, forward chaining, backward chaining. Advantages and disadvantages of expert system. Fuzzy logic and fuzzy rules. Fuzzy expert systems.