COURSE TITLE	**RISK AND FRAUD ANALYTICS**
COURSE CODE	**04BA0502**
COURSE CREDITS	**4**

Objective:

1 N/A

Course Outcomes: After completion of this course, student will be able to:

1 Construct an understanding of the fundamentals of fraud, its various types, and associated risks
2 Differentiate between anomalies and fraudulent activities within datasets
3 Apply data analysis techniques to detect and prevent fraudulent activities
4 Utilise analytical tools and methodologies for fraud detection in billing and payroll systems
5 Interpret results from various fraud detection tests and make informed decisions

Pre-requisite of course:NONE

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Introduction to Fraud and Risk Analytics** Definition and types of fraud, Understanding anomalies vs. fraud, The risk associated with fraudulent activities, Fraud detection methodologies, Recognizing fraud patterns, Introduction to data analytical software tools, Data inclusions and deletions in fraud analysis	12
2	**Data Preparation for Fraud Analysis** Evaluation and analysis of data, Obtaining and handling data files, Understanding different file formats, Data preparation and cleaning techniques,, Organizing and arranging data for analysis	10
3	**Data Analysis Tests for Fraud Detection** Benford's Law, , Number duplication test, Z-score analysis, , Relative size factor test, , Same-same-same test, , Same-same-different test, Even amounts analysis, Correlation and trend analysis	14

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Contents : Unit	Topics	Contact Hours
4	**Detecting Billing Scheme Frauds** Data familiarization techniques, Application of Benford's Law in billing, , Relative size factor and z-score tests in billing data, , Detection of even dollar amounts, , Same-same-same and same-same-different tests in billing,, Identifying payments without purchase orders, , Analyzing time gaps between invoice and payment dates, , Detecting post office box addresses and matching employee addresses to suppliers, Identifying duplicate addresses in vendor master files, Detecting payments to vendors not in the master list, Gap detection in check number sequence	14
5	**Payroll and Expense Reimbursement Fraud Analytics** Understanding payroll fraud mechanisms, , Data analysis in payroll systems, , Analyzing payroll registers and master files, , Commission tests and their applications, Detecting anomalies in expense reimbursements	10
Total Hours		**60**

Textbook :

1 Fraud Analytics Using Descriptive, Predictive, and Social Network Techniques: A Guide to Data Science for Fraud Detection, Baesens, B., Van Vlasselaer, V., & Verbeke, W. , WILLEY, 2015

2 Fraud Analytics: Strategies and Methods for Detection and Prevention. , Spann, D. D. , WILEY, 2014

References:

1 Mitra, S. (2019). Data Mining and Business Intelligence. Oxford University Press, Mitra, S. (2019). Data Mining and Business Intelligence. Oxford University Press, Mitra, S., Oxford University Press, 2019

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
0.00	0.00	35.00	35.00	30.00	0.00

Instructional Method:

1 Theory

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Supplementary Resources:

1 https://www.britannica.com/science/statistics/Random-variables-and-probability-distributions

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