Module Code		Module Title		GPA/NGPA	
CS3121		Introduction to Data Science		GPA	
Hours/Week		Credits	Pre-Requisites / Co-Requisites	Evaluation (%)	
Lecture	Lab/Tutorial			CA	WE
2	2	3	CS2023	40	60

Module Objectives

To Provide Fundamental Knowledge and Skills in Data Science

Learning Outcomes

After completing this module, the student should be able to;

LO1: Demonstrate data acquisition, data representation and data pre-processing skills to describe, analyse and repurpose data from a variety of sources.
LO2: Apply critical thinking and statistical techniques to understand and visualize relationships in data
LO3: Apply machine-learning techniques in exploratory data analysis for problems related to commerce, industry and research.
LO4: Design and compute a statistical relationship in data including correlation and linear regression
LO5: Design and develop data-driven algorithms for outcome prediction

Syllabus Outline	Learning Outcomes
1. Data Acquisition, pre-processing [4hrs]	LO1, LO2
2. Big Data [4hrs]	LO2, LO3
3. Data Documenting [2hrs]	LO1, LO2
4. Descriptive Analytics [4hrs]	LO4
5. Association, Correlation, Agreement. Causation [4hrs]	LO2, LO4
6. Regression / Classifications / Clustering [6hrs]	LO3, LO4
7. Simple data science project [4hrs]	LO3, LO4, LO5

Assessments

Learning outcome	Assessment		
	Cont. Assessments		End Semester Examination
	Labs	Other Assessments	
LO1	20%	-	80%
LO2	20%	20%	60%
LO3	20%	20%	60%
LO4	20%	20%	60%
LO5	-	40%	60%

Tutorials/Continuous Assessments

- **Laboratory Sessions [16hrs]**
  - Lab 1: Data Acquisition and Pre-processing: Students will be tasked with acquiring data from a given source and pre-processing it for further analysis.
  - Lab 2: Big Data Handling: Students will work with a large dataset and apply techniques to manage and analyze it.
  - Lab 3: Descriptive Analytics: Students will apply descriptive analytics on a given dataset.
  - Lab 4: Regression/Classification/Clustering: Students will apply these techniques on a dataset to draw insights.
- **Assignments [12hrs]**
  - Assignment 1: Association, Correlation, Agreement. Causation: Students will be given a dataset and they will need to find associations, correlations, agreements, and causations in the data.
  - Assignment 2: Simple Data Science Project: Students will be tasked with a simple data science project where they will need to apply all the techniques learned in the module.

Learning Outcome/Program Outcome Mapping

LO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO1	M	M	M	H	M							
LO2	M	H	H	L	M	L						
LO3	H	H	M	M	M	M	L					L
LO4	M	L	M	M	M							
LO5	H	H	H	M	M	L	L	L	L			L
Module	H	H	M	M	M	L	L	L	L			L

H – High **M –** Medium **L -** Low

Recommended Text Books/ Other Learning Materials

Text books:

1. Data Science from Scratch: First Principles with Python by Joel Grus
2. Introduction to Data Science , Data Analysis and Prediction Algorithms with R by Rafael A Irizarry