Course Type	Course Code	Name of the Course	L	T	P	Credits
DP	NMNC518	Mine Simulation And Data Analytics Lab	0	0	3	1.5
Course Objective						
This course will cover data analytics applicable to mining systems using Python.						
Learning Outcomes						
The students will use Python to gain practical skills in artificial intelligence and other digital technologies.						

Units	Course Content	Contact hours	Learning Outcomes
Unit 1	Introduction to Python and its installation	3	Students will learn the basics of Python.
Unit 2	Basic syntax of Python in terms of variables, conditional statements, loops, operators and function	3	Students will learn the terminologies of Python.
Unit 3	Introduction of the primary library for data analytics (NumPy, pandas, sklearn, matplotlib) Part I	3	Students will learn the Python library and its uses.
Unit 4	Introduction of the primary library for data analytics (NumPy, pandas, sklearn, matplotlib) Part II	3	
Unit 5	Data visualisation using matplotlib for pre-defined dataset	3	Students will learn the visualisation tools of Python libraries.
Unit 6	Data manipulation and imputation for modelling	3	Students will learn the manipulation and imputation techniques.
Unit 7	Feature engineering of the dataset -Part I	3	Students will learn the feature engineering applications using Python.
Unit 8	Feature engineering of the dataset -Part II	3	
Unit 9	Dimensionality reduction (using PCA) and modelling (K-means) of the dataset	3	Students will learn the PCA technique and its applications using Python.
Unit 10	Perform supervised modelling on the predefined dataset using linear regression and a support vector machine – Part I, Part-II, Part-III.	9	Students will learn the supervised modelling approaches using Python.
Unit 11	Design a Neural network to perform the modelling on User-defined datasets -Part I and part-II.	6	Students will learn the ANN modelling approaches using Python.
	Total	**42**	

Reference Books

1) Introduction to Python Programming, DIGITAL VERSION ISBN-13 978-1-961584-45-7, Free PDF will be available to students (©2024 Rice University. Textbook content produced by OpenStax is licensed under Creative Commons Attribution 4.0 International License (CC BY 4.0)).