RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FOUR YEAR BACHELOR OF TECHNOLOGY (B.TECH.) DEGREE COURSE
SEMESTER: SEVENTH (C.B.C.S.)
BRANCH: COMPUTER SCIENCE AND ENGINEERING

Subject : Python Programming (Open Elective- II) **Subject Code BEAI&DS-704T**

Load	Credit	Total Marks	Internal Marks	University Marks	Total
03 Hrs (Theory)	**03**	**100**	**30**	**70**	**100**

Prerequisite(s): **C Language**

Course Objective/Learning Objective:

1	**To understand the fundamentals of Python programming language.**
2	**To develop problem-solving and programming skills using Python.**
3	**To use Python in different applications such as web development, data analysis, and artificial intelligence.**

Course Outcome:

At the end of this course, Student are able to:

CO1	**Develop programming skills in Python programming language.**
CO2	**Implement object-oriented programming concepts using Python.**
CO3	**Utilize Python libraries for data analysis and visualization.**
CO4	**Develop web applications using Flask framework.**
CO5	**Apply machine learning concepts using Scikit-Learn.**

UNIT I: (08 Hrs) Introduction to Python Programming: **Overview of Python programming language, Variables, data types, and operators, Conditional statements and loops, Functions, and modules**
UNIT II: (07 Hrs) Object-Oriented Programming in Python: **Object-oriented programming concepts, Classes, objects, and methods, Inheritance, and polymorphism**
UNIT III: (07 Hrs) Python Libraries for Data Analysis: **Introduction to NumPy and Pandas, Data manipulation with NumPy and Pandas, Data visualization with Matplotlib and Seaborn.**
UNIT IV: (07 Hrs) Web Development with Flask: **Introduction to Flask framework, creating web applications using Flask, Flask extensions for database integration**
UNIT V: (07 Hrs) Introduction to Machine Learning with Python: **Introduction to Scikit-Learn, Supervised and unsupervised learning, Classification, and regression algorithms**
Textbooks: ● **"Python for Everybody: Exploring Data in Python 3" by Charles Severance.** ● **"Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming" by Eric Matthes.**
References: ● **"Learning Python, 5th Edition" by Mark Lutz.** **"Python Data Science Handbook: Essential Tools for Working with Data" by Jake VanderPlas.**