



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

"ವಿಜ್ಞಾನ ಸಂಗಮ" ಬೆಳಗಾವಿ-590018, ಕರ್ನಾಟಕ, ಭಾರತ  
"ಜ್ಞಾನ ಸಂಗಮ", ಬೆಳಗಾವಿ-590018, ಕರ್ನಾಟಕ, ಭಾರತ

## Visvesvaraya Technological University

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Date: 7 DEC 2021

### CIRCULAR

**Subject:** Updated syllabus 20MCA31- Data Analytics Using Python regarding...

**Reference:** Hon'ble Vice-Chancellor's approval dated: 01.12.2021

The existing syllabus of the subject **20MCA31- Data Analytics Using Python** updated by the Board of Studies in Master of Computer Applications in order to map with mentioned textbook and reference books. As per the BoS the module 03, 04, and 05 have been updated to map with the prescribed textbook however there is no change in modules 01 and 02. The updated syllabus is enclosed with this circular for stakeholders' reference.

All the principals of Engineering Colleges are hereby informed to bring the content of this circular to the notice of the concerned. Please note: corrected scheme of programs is made available @ <https://vtu.ac.in/en/pg-scheme-syllabus/>

Sd/-  
Registrar

**Encl:** As mentioned above.

**To,**

- All the Principals of the Engineering Colleges under the ambit of VTU Belagavi.

**Copy to:**

- The Hon'ble Vice-Chancellor through the secretary to VC for information
- The Registrar(Evaluation) for information and needful
- The Registrar's Office, VTU, Belagavi, for information.
- The Special Officer, Academic Section, VTU Belagavi, for information.
- The Director ITI SMU CNC for information and to upload the circular on the VTU web portal

REGISTRAR

7/12

<b>Data Analytics using Python</b>	
Semester: III	CIE Marks : 40
Subject Code : 20MCA31	SEE Marks : 60
Contact Hours(L:P:T) : 4-0-0	Exam Hours : 03
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>• CO1: Demonstrate basic data analytics principles and techniques</li> <li>• CO2: Apply control structures the concepts of inheritance and overloading for a given problem.</li> <li>• CO3: Perform essential operations using Numpy and Pandas</li> <li>• CO4: Structuring the data in the dataset for a given problem.</li> <li>• CO5: Demonstrate the concepts of data visualization.</li> </ul>	
<b>Module 1 : Python Basic Concepts and Programming</b>	
<p>Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type( ) Function and Is Operator, Control Flow Statements, The if Decision Control Flow Statement, The if...else Decision Control Flow Statement, The if...elif...else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements, Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.</p>	
<b>Module 2: Python Collection Objects, Classes</b>	
<p>Strings- Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings, Lists-Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods. Sets, Tuples and Dictionaries. Files: reading and writing files. Class Definition – Constructors – Inheritance – Overloading</p>	
<b>Module 3: Introduction to Numpy and Pandas</b>	
<p>Numpy:-Understanding datatypes in python, basics of NumPy arrays, computation on NumPy arrays: universal functions. <i>(refer chapter 2 from python datascience handbook)</i></p> <p>Pandas:-Introducing to pandas data structures, essential functionality, summarizing and computing descriptive statistics, handling missing data. <i>(refer chapter 5 from python for data Analysis)</i></p>	
<b>Module 4: Data Loading and Data Wrangling</b>	
<p>Reading and writing data in text format, interacting with databases, combining and merging data sets, reshaping and pivoting, data transformation, string manipulation <i>(refer chapter 6 and 7 from python for data Analysis)</i></p>	
<b>Module 5: Visualization with Matplotlib and Seaborn</b>	
<p>General Matplotlib tips, simple line plots, simple scatter plots, visualizing errors, density and contour plots, histograms, binning, and density, customizing plot legends and colorbars, customizing matplotlib, visualization with seaborn.</p> <p><i>(refer chapter 4 from python datascience handbook)</i></p>	

**Text Books:**

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (<http://greenteapress.com/wp/thinkpython/>)
2. Mark Lutz, "Programming Python", O'Reilly Media, 4th edition, 2010.
3. Jake Vander plas, "Python Data Science Handbook: Essential tools for working with data", O'Reilly Publishers, 1 Edition.
4. Wes Mc Kinney, "Python for Data Analysis", O'Reilly Media, 2012 Mark Lutz, "Programming Python", O'Reilly Media, 4th edition, 2010.

**Reference books:**

1. Tim Hall and J-P Stacey, "Python 3 for Absolute Beginners", Apress, 1st edition, 2009.
2. Magnus Lie Hetland, "Beginning Python: From Novice to Professional", Apress, Second Edition, 2005.
3. Shai Vaingast, "Beginning Python Visualization Crafting Visual Transformation Scripts", Apress, 2nd edition, 2014.

Suggested.