HSNC UNIVERSITY, MUMBAI

(2025-2026)

Ordinances and Regulations With

Respect to

Choice Based Credit System

(CBCS)

For the Programmes Under

The Faculty of Science and Technology

Framed According to the National Education Policy (NEP 2020)

To be implemented from Academic Year: 2025-2026

For the Course

Computer Programming

Curriculum – Second Year Undergraduate

Semester-III and Semester -IV

2025-2026

HSNC UNIVERSITY, MUMBAI

Board of Faculty of Science & Technology

Board of Studies in the Subjects of Statistics

1) Name of Chairperson/Co-Chairperson/Coordinator:-

a) Dr Asha Jindal, Professor and (UG: Head &PG: Coordinator), Department of Statistics, K. C. college, HSNC University Churchgate, Mumbai –400 020. Email ID- asha.jindal@kccollege.edu.in Mobile no- 9821235627

2) Two to five teachers each having minimum five years teaching experience amongst the full time teachers of the Departments, in the relevant subject.

a) **Dr. S. B. Muley,** Associate Professor, Department of Statistics, K. C. college, HSNC University Churchgate, Mumbai – 400 020. Email ID sakharam.muley@kccollege.edu.in , Mobile No- 9323817918

b) **Mrs. Pratiksha Kadam,** Associate Professor, Department of Statistics, K. C. college, HSNC University Churchgate, Mumbai – 400 020. Email ID pratiksha.kadam@kccollege.edu.in , Mobile No- 7507162816

c) **Ms. Shailaja Rane,** Assistant Professor, Department of Statistics, K. C. college, HSNC University Churchgate, Mumbai – 400 020. Email ID shailaja.rane@kccollege.edu.in, Mobile No- 7506986359

d) **Mr. Yunus Gangat**, Assistant Professor, H. R. College, HSNC University, Mumbai, Email ID: gangatyunus@gmail.com, Mobile no. 9892099801 **(Special Invitee)**

3) One Professor / Associate Professor from other Universities or professor / Associate Professor from colleges managed by Parent Body;

a) **Dr Anjum Ara Ahmed;** Professor and Former I/C Principal, Rizvi College, Mumbai. Email ID **anjumahmed8@gmail.com, Mobile No-** 8451046220

4) Four external experts from Industry / Research / eminent scholar in the field relevant to the subject nominated by the Parent Body;

a. **Prof. Suresh Kumar Sharma,** Senior Professor, Department of Statistics, Panjab University, Chandigarh.
   Email ID ssharma643@yahoo.co.in, **Mobile No-**9815911381

b. **Mr Mukesh Jain,** Vice President and Chief Technological Officer, Capgemini. Email ID mdjain@hotmail.com, **Mobile No-**7972637347.

c. **Dr Santosh Gite,** Professor and Head, Dept. of Statistics, University of Mumbai, Mumbai. Email ID santgite@yahoo.com, **Mobile No-** 9167157717.

d. **Mr Prashant Kumar Nair,** Director, Geo Spatial Analytics Global Lead, Intelligent Analytics, Nielsen Connect, Email ID prashantkumar.nair@nielsen.com , **Mobile No-**9833747057.

5. Top rankers of the Final Year Graduate and Final Year Post Graduate examination of previous year of the concerned subject as invitee members for discussions on framing or revision of syllabus of that subject or group of subjects for one year.

a) **Mr. Neel More(** (Postgraduate student 23-25) Email ID- neelmore85@gmai.com ; Mobile no- 9867374401

b) **Ms. Sarrah Pittalwala** (undergraduate student 22-25) Email ID-; sarrah,pittalwala@gmail.com; Mobile no- 9892828381

SEC – Computer Programming I – Semester III

Subject Code	Unit Title	No of Hours	Total No. of Hours	No of Credits	Total No. of Credits	Total Marks
STA202C	MS Access	15	30	1	2	50
	Python Programming	15		1		
STA210D	Practical based on STA202C	30	30	1	1	25

Couse Objectives

1. To introduce the fundamentals of database design and practical usage through MS Access.
2. To develop problem-solving skills using structured programming concepts in Python.
3. To enable students to understand and apply data structures (lists, tuples, dictionaries, sets) in real-world problems.
4. To enhance analytical abilities by designing queries, forms, reports, and simple Python programs.

Course Learning Outcomes

After completing this course, students will be able to:

1. Create, modify, and manage databases in MS Access using tables, queries, forms, and reports.
2. Write and execute Python programs using variables, operators, conditionals, and loops.
3. Apply built-in data structures (lists, tuples, strings, dictionaries, sets) to solve computational problems.
4. Demonstrate the ability to use aggregate functions, calculated fields, and control structures for problem-solving.

Syllabus

Unit	Content	No. of Lect.
1	**MS Access** 1.1 Adding a table to a database, Adding fields to a table, adding a Lookup field, setting a Primary key, Using the input mask wizard, Saving design changes. 1.2 Importing data (From Excel) 1.3 What is a Query?, Creating a query, working with queries, saving and running a query, creating calculated fields, using aggregate functions, Understanding query properties, 1.4 Joining Tables. Multi table 1.5 What is a Form?, Using the form tool, Creating a form	15

	with form wizard, 1.6 Working in design view, Changing the form layout, Using calculated controls, Working with records on a Form. 1.7 What is a report tool? Printing report, saving a report, designing a report, changing report layout, creating mailing labels	
2	**Python Programming** 2.1 Introduction to Python Programming 2.2 Input and Output Statements 2.3 Keywords, Identifiers, Constants and Variables 2.4 Basic Data Types in Python 2.5 Lists, Tuples, Strings, Dictionaries and Sets 2.6 Program based on Arithmetic, Logical and Relational Operators Conditional Statements and Loops in Python: if, if-else, if-elif, while loop and for loop	15

Online Resources

1.	NOC:The Joy of Computing using Python, Prof. Sudarshan Iyengar, IIT Ropar: https://nptel.ac.in/courses/106/106/106106182/
2.	NOC:Programming, Data Structures and Algorithms using Python, Prof. Madhavan Mukund, IIT Madras: https://nptel.ac.in/courses/106/106/106106145/
3.	Data Base Management System, Prof. Partha Pratim Das, IIT Kharagpur: https://nptel.ac.in/courses/106/105/106105175/

References

1. Access Database Design & Programming: What You Really Need to Know to Develop with
2. Access (Nutshell Handbooks), Steven Roman, O'Reilly, 1997
3. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
4. How to think like a Computer Scientist: Learning with Python, by Downey, A. et al John Wiley, 2015.
5. Fundamentals of Python - First Programs, by Lambert K. A., Cengage Learning India, 2015
6. Asha Jindal(Ed): Analyzing and Visualizing Data using Free Open Source Software: Python Programming with Case Studies, Shailja Prakashan and K. C. College, 2020.
7. Python Crash Course by Eric Matthes, No Starch Press, 2019
8. Microsoft Access 2019 Step by Step, Joan Lambert & Curtis Frye, Microsoft Press, 2019

Detailed Practical Scheme

Paper Code	Title	No. of Lectures
SEC – Computer Programming I	1. Installing Access, creating table, adding record 2. Creating Query 3. Creating Form for Front-end User 4. Multi table query and data entry, report presentation 5. Writing algorithms and drawing flowcharts (Simple Loops). 6. Installing python 7. Loading a Python editor program-Entering and Executing a simple Python program. 8. Python program to input name-and sales & then print name and commission. 9. Python program to compute commission, discount etc using if() condition. 10. Computing income tax based on given criterion. 11. Printing numbers and summing number using loops. 12. Printing interest and depreciation tables 13. Python program to perform list, tuple, dictionary and set operations (Union, Intersection, Difference) – 2 hours 14. Python program for string manipulation and pattern matching – 2 hours 15. Database project: Creating a student database with forms, queries, and reports – 2 hours	02 Lectures per Practical per Batch

Formative Assessment

The evaluation of the Practical Course shall be conducted **out of 50 marks**, consisting of **10 marks for the internal component** and **40 marks for the Practical Examination**. The **50 marks** for the Practical Course Evaluation will be **converted to 25 marks**.

Internal Evaluation (10 marks):

1. Practical Journal – 5 Marks
2. Viva – 5 Marks

Practical Examination Paper Pattern:

Q. No.	Question Type	Marks
Q1	Any 2 out of 3 based on Unit 1 (Each question carries 10 Marks)	20
Q2	Any 2 out of 3 based on Unit 2 (Each question carries 10 Marks)	20

Summative Assessment

Q. No.	Question Type	Marks
Q1	Any 5 out of 7 based on Unit 1 (Each question carries 5 Marks)	25
Q2	Any 5 out of 7 based on Unit 2 (Each question carries 5 Marks)	25

SEC – Computer Programming II – Semester IV

Subject Code	Unit Title	No of Hours	Total No. of Hours	No of Credits	Total No. of Credits	Total Marks
STA204C	MS Excel Basics	15	30	1	2	50
	Advanced MS Excel	15		1		
STA212D	Practical based on STA204C	30	30	1	1	25

Couse Objectives

1. To provide students with the ability to efficiently use Excel for data entry, formatting, and calculations.
2. To familiarize students with Excel functions (mathematical, statistical, logical, financial, text, and date).
3. To enable students to perform data analysis using sorting, filtering, pivot tables, and charts.
4. To develop proficiency in advanced tools like Goal Seek, Solver, Scenarios, Data Validation, and Macros.

Course Learning Outcomes

After completing this course, students will be able to:

1. Organize and analyze data using worksheets, cell references, and Excel functions.
2. Apply statistical, logical, and financial functions to real-world problems.
3. Create pivot tables, charts, and dashboards for effective data visualization.
4. Use advanced Excel features like Goal Seek, Solver, and Macros to solve business and analytical problems.

Syllabus

Unit	Content	No. of Lect.
1	**MS Excel Basics** 1.1 Creating and Navigating worksheets and adding information to worksheets 1.1.1 Types of data, entering different types of data such as texts, numbers, dates, functions. Cell referencing 1.1.2 Quick way to add data Auto complete, Autocorrect, Auto fill, Auto fit. Undo and Redo, Flash fill 1.1.3 Moving data, contiguous and non-contiguous selections, Selecting with keyboard. Cut-Copy, Paste. Adding and moving columns or rows. Inserting columns and rows. 1.1.4 Find and replace values. Spell check. Flash fill 1.1.5 Formatting cells, Numbers, Date, Times, Font, Colors, Borders, Fills. 1.1.6 Adding, removing, hiding and renaming worksheets. 1.1.7 Add headers/Footers to a Workbook. Page breaks, preview. 1.1.8 Creating formulas, inserting functions, cell references, Absolute, 1.1.9 Relative (within a worksheet, other worksheets and other workbooks). 1.2 Functions 1.2.1 Mathematical and statistical functions. ROUND, ROUNDDOWN, ROUNDUP, CEILING, FLOOR, INT, MAX, MIN, MOD, SQRT, ABS, SUM, COUNT, AVERAGE 1.2.2 Financial functions: FV, PV, PMT, PPMT, IPMT, NPER, RATE 1.3 Data Analysis 1.3.1 Sorting, Subtotal. 1.3.2 Pivot Tables- Building Pivot Tables, Pivot Table regions,Rearranging Pivot Table	15
2	**Advanced MS Excel** **2.1 Multiple Spreadsheets** 2.1.1 Creating and using templates, using predefined templates, Adding protection option. 2.1.2 Creating and Linking Multiple Spreadsheets. 2.1.3 Using formulas and logical operators. 2.1.4 Creating and using named ranges. 2.1.5 Creating Formulas that use reference to cells in different worksheets. **2.2 Functions** 2.2.1 Database Functions LOOKUP, VLOOKUP, HLOOKUP 2.2.2 Conditional Logic functions IF, Nested IF, COUNTIF, SUMIF, AVERAGEIF 2.2.3 String functions LEFT, RIGHT, MID, LEN, UPPER, LOWER, PROPER, TRIM, FIXED	15

	2.2.4 Date functions TODAY, NOW, DATE, TIME, DAY, MONTH, YEAR, WEEKDAY, DAYS360 2.2.5 Statistical Functions COUNTA, COUNTBLANK, CORREL, LARGE, SMALL **2.3 Data Analysis** 2.3.1 Filter with customized condition. 2.3.2 The Graphical representation of data Column, Line, Pie and Bar charts. 2.3.3 Using Scenarios, creating and managing a scenario. 2.3.4 Using Goal Seek 2.3.5 Using Solver 2.3.6 Data Validation, Consolidate, Remove Duplicates 2.3.7 Understanding Macros, Creating, Recording and Running 2.3.8 Simple Macros. Editing a Macro (concept only)	

Online Resources

1.	Microsoft Learn – Excel Training (official, structured) https://learn.microsoft.com/en-us/training/excel/
2.	ExcelJet – Quick Guides to Formulas & Shortcuts https://exceljet.net/
3.	Excel Easy – Beginner to Advanced Tutorials (covers formulas, functions, charts) https://www.excel-easy.com/

References

1. Excel 2019 Advanced Topics: Leverage More Powerful Tools to Enhance Your Productivity (Excel 2019 Mastery) – George Natha
2. Data Analytics with MS Excel & Power BI – Punit Prabhu
3. Excel Bible – John Walkenbach (for in-depth Excel functions and data analysis)
4. Microsoft Excel 2019 Step by Step – Curtis Frye
5. Excel Power Programming with VBA, Michael Alexander & Dick Kusleika, Wiley, 2019
6. Data Analysis and Business Modeling with Excel 2016, Wayne Winston, Microsoft Press

Detailed Practical Scheme

Paper Code	Title	No. of Lectures
SEC – Computer Programming II	1. Templates 2. Cell formatting, Header footer, rows to be repeated on each page setting 3. All function from numeric, string, date and time, financial function 4. Linking worksheets 5. Data sorting, multi sorting, customized sorting	02 Lectures per Practical per Batch

	6. Filtering data with auto filter and advance filter 7. Subtotal and pivot table 8. Charts bar, pie, stack, column 9. Solver (minimum 2 problems) 10. Goal Seek (minimum 2 problems) 11. Scenario manager (minimum 2 problems) 12. Creating macro, deleting macro and playing macro 13. Case Study: Sales Data Analysis using Pivot Tables and Charts – 2 hours 14. Financial Modeling in Excel using PV, FV, PMT functions – 2 hours 15. Data Cleaning and Validation using Excel Tools – 2 hours	

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