HSNC University Mumbai

(2023-2024)

Ordinances and Regulations

with Respect to

Choice Based Credit System

(CBCS)

For the Programs Under

The Faculty of Science and Technology

For the Course

MATHEMATICS
Semester-I and Semester -II
With effect from the Academic year 2023-2024
under NEP 2020

Board of Studies in Mathematics

1. **Name of Chairperson**
   Mrs. Usha G. Hemasundar ,Head, Department of Mathematics, M Sc Mathematics
   Associate Professor, K. C. College Ph: 9892234921 Email id: usha.gollakota@kccollege.edu.in
   Name of Co-Chairperson
   Ms. Shubhada Kanchan, MSc Mathematics,Department of Mathematics and Statistics
   Assistant Professor, H. R. College,Ph: 9975673087 Email id: shubhadark@yahoo.co.in

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. Pankit Gandhi, MSc (Mathematics), M Phil, Ph.D., LL.B., Associate Professor, K. C. College, Ph: 8169381936   Email id: pankit.gandhi@kccollege.edu
   b.) Mrs. Vijayalaxmi Suvarna ,M Sc Mathematics, M.Phil ,Assistant Professor,H. R. College, Ph: 9987395783; Email id: vijayalaxmi_suvarna@rediffmail.com
   c.) Mrs. Mrunal Hardikar ,M Sc Mathematic, Assistant Professor, K. C. College, Ph: 9653227252; Email id: mrunal.hardikar@kccollege
   d.) Mrs. Nilesh Bhandarkar ,M Sc Mathematic, Assistant Professor, K. C. College, Ph: 98200868037; Email id:nilesh.bhandarkar@kccollege

3. **One Professor / Associate Professor from other Universities or professor / Associate Professor from colleges managed by Parent Body; nominated by Parent Body;-**
   a.) Dr Sushil Kulkarni , Professor, Head, School of Mathematics,Applied Statistics &Analyticas,NMIMS,PhNo9870126536;Emailid: sushiltry@gmail.comn

4. **External experts from Industry / Research / eminent scholar in the field relevant to the subject nominated by the Parent Body**;
   a.) Dr Ajit Kumar , Ph.D. Mathematics,Associate Professor and Head, Department of Mathematics, Institute of Chemical Technology, Mumbai,Ph No. 99690 31202; E Mail id ajit72@gmail.com

   b.) Dr. Amiya Ranjan Bhowmick, Ph.D. Applied Mathematics and Statistics; Assistant Professor, Institute of Chemical Technology, Mumbai, Ph no: 08334835300/7738101583; amiyaiitb@gmail.com/ar.bhowmick@ictmumbai.edu.in
   c.) Mr. Prashant Shukla,MSc statistics, Masters in Financial Management JBIMS; Chief Investment Officer, Aston Capital Advisor Pvt Ltd,Partner at HBD Consulting LLP; Ph no:9821470975; Email id: sprash@rediffmail.com
   d.) Mr. Kaushal Shah,M.Com, PGDBA(Finance),Senior Manager, Treasury Reliance Power, Ph no: 9320105703; Email id: krushalshah78@gmail.com

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.**

   Ms. Gunjan Shinde, B Sc, Mathematics, Currently pursuing online Degree in data Science and Programming from IIT ,Madras

Syllabus for Vocational Skill Course
FYBCom/FYBAF/FYBBI/FYBFM
Financial Mathematics and Statistics using MS-Excel -I

Semester I

Course Objectives:
- To develop an understanding of MS-Excel
- To develop the ability to construct and interpret diagrams and graphs which are applicable to real life in the fields of commerce, economics and management.
- To learn to convert the given mathematical and statistical problems into data in MS-Excel and then apply functions and commands to get the desired solutions.

Learning Outcomes: At the end of the course, students will be able to
- use Ms-Excel fairly easily
- represent data using frequency tables, graphs and diagrams.
- solve mathematical and statistical problems easily using the software through hands on training during the practicals.

Evaluation Pattern:
The course will be assessed for a total of 25 marks and will consist of:
- Journal consisting of output of at least 9 practicals – 5 marks.
- Practical examination at end of Semester – 20 marks

Detailed Syllabus

Unit	Content	No. of Practicals
I	**Introduction to Excel** 1.1 Workbook, worksheets, cells, types of data, cell references, cut, copy, paste (paste-special, values, formulas), conditional formatting 1.2 Operators- Arithmetic operators, Relational operators, Logical operators, creating formulas, functions, working with excel sheets – freeze panes, sort, custom sort, filter, find and replace, IF and Nested IF functions.	3
II	**Time value of money, annuities and loan amortization** 2.1 Compound interest, discrete and continuous compounding, nominal and effective rate of interest 2.2 Regular annuity, future and present value of annuity, equated monthly instalments, amortization.	3
III	**Matrices, simultaneous equations, LPP** 3.1 Matrices types, operations on matrices – scalar multiplication, addition, subtraction, product of matrices, determinants, inverse of a matrix 3.2 Simultaneous Equations construction and solving 3.3 Linear Programming Problems in two variables, formulation of LPP and	3

	solving graphically	
IV	**Data representation using diagrams:** 4.1 Constructing frequency tables 4.2 Making bar charts, pie charts and histograms	3
V	**Revision / Extra Practicals**	3

List of Practicals
1. Working with Excel sheets.
2. Conditional Formatting, Sort and Filter.
3. Working with Formulas and Logical Operators.
4. Time Value of Money.
5. Annuities.
6. Loan Amortization.
7. Working with Matrices I
8. Working with Matrices II
9. Simultaneous Equations.
10. Linear Programming Problems.
11. Data Representation using Diagrams I
12. Data Representation using Diagrams II

Note:
1. Each practical will be for two hours' duration.
2. A practical batch size will be as per the university norms.
3. The students will have to maintain a file/journal in which the practical questions and the output obtained in the practicals should be filed.

Syllabus for Vocational Skill Course
FYBCom/FYBAF/FYBBI/FYBFM
Semester II
Financial Mathematics and Statistics using MS-Excel -II

Course Objectives:
- To learn about the tools which can be helpful in research.
- To learn the various tools used in economics and finance to make better decisions.

Learning Outcomes:
- At the end of the course, student will be able to calculate measures of central tendency and measures of dispersion through excel which can be useful in research
- To find relationships between variables which can be used for forecasting.

Evaluation Pattern:

The course will be assessed for a total of 25 marks and will consist of:

- Journal consisting of output of at least 9 practicals – 5 marks.
- Practical examination at end of Semester – 20 marks

Detailed Syllabus

Unit	Content	No. of Practicals
I	**Measures of Central Tendency** 1.1 Mean 1.2 Median, Quartiles Deciles and Percentiles 1.3 Mode	3
II	**Measures of Dispersion** 2.1 Range and coefficient of range 2.2 Quartile Deviation and coefficient of quartile deviation 2.3 Mean Deviation and coefficient of mean deviation 2.4 Standard deviation and coefficient of variation	3
III	**Correlation and Regression** 3.1 Scatter plot, Karl Pearson's formula, Rank Correlation, Spearman's coefficient 3.2 Linear Regression, forecasting	3
IV	**Time Series and Index Numbers** 4.1 Time Series Analysis, forecasting using time series 4.2 Index Numbers unweighted and weighted, Laspeyre, Paasche, Fischer, Marshall-Edgeworth and Dorbish-Bowley index numbers	3
V	**Revision / Extra Practicals**	3

List of Practicals
1. Mean, Median and Mode.
2. Quartiles, Percentiles and Deciles.
3. Range, Quartile Deviation and their coefficients
4. Mean deviation from mean, median, mode and their coefficients
5. Standard deviation, variance, coefficient of variation
6. Scatter plots
7. Karl Pearson and Spearman's coefficients
8. Plotting linear equations
9. Linear Regression
10. Calculating moving averages
11. Forecasting using time series
12. Index numbers

Note:
1. One practical will be of two hours each

2. A practical batch will according to the university norms.
3. Students will have to maintain a file/journal in which the practical questions and the output obtained in the practicals will be filed.

Reference Books:
1. Microsoft Excel 2016 Bible by John Walkenbach, Wiley India
2. Microsoft Excel 2016 for Dummies by Greg Harvey, Wiley
3. Excel 2016 from scratch: Excel Course with Demos and Exercises by Peter Kalmstrom and Kate Kalmstrom
4. Mathematics for Economics and Finance Methods and Modelling by Martin Anthony and Norman Biggs, Cambridge University Press
5. Business Mathematics by D.C.Sancheti and V.K.Kapoor, Sultan Chand & Sons
6. Mathematics for Business and Economics by J.D.Gupta, P.K.Gupta and ManMohan, TataMc-Graw Hill Publishing Co.Ltd.
7. Quantitative Methods-Part-I by S.Saha and S.Mukerji, New Central Book Agency
8. Investments by J.C.Francis & R.W.Taylor, Schaum's Outlines, Tata Mc-GrawHill
9. Operations Research by Gupta and Kapoor
10. Statistical Methods by S.G.Gupta, S.Chand &Co
11. Statistics for Management by Levin & Rubin, Prentice Hall of India
12. Statistics - Theory, Method & Applications by D.S.Sancheti & V.K.Kapoor
13. Modern Business Statistics (Revised) by B.Pearles & C.Sullivan –Prentice Hall of India.
14. Business Mathematics & Statistics by B Aggarwal, Ane Book Pvt.Limited

Software Requirement:
Microsoft Excel 2016 or above.