MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB
(Formerly West Bengal University of Technology)

Syllabus for B. Sc. in Data science
(Effective for Academic session 2019-20)

2ⁿᵈ SEMESTER

BSCDA- 201: SOFT-SKILLS FOR BUSINESS

Objectives

To enable the students to:

- Developbothoralandwrittencommunicationskillsrelatingtoorganizationaland Business issues

Units	Course Content
1	**ELEMENTS OF COMMUNICATION** Meaning, Importance, Objectives & Principles of Communication, Process, impediments of effective communication, Strategies for effective communication. Types and forms of communication NonverbalCommunication-BodyLanguage,Gestures,Postures,FacialExpressions,Dresscodes, The Cross Cultural Dimensions of Business Communication, Listening & Speaking, Techniques of Eliciting Response, Probing Questions, Observation, Business and social etiquette.
2	**PUBLIC SPEAKING** ImportanceofPublicSpeakingandSpeechComposition-PrinciplesofEffectiveSpeaking&Presentations. Technicalspeeches&Non-technicalpresentations.Speechforintroductionofaspeaker-Speechforvote of thanks-Occasional speech-Theme speech. Moderating programs-Use of Technology
3	**INTERVIEW TECHNIQUES** Importance of Interviews, Art of conducting and giving interviews, Placement interviews-discipline interviews –Appraisal interviews– Exit interviews.
4	**MEETINGS** ImportanceofMeetings-OpeningandClosingMeetings-ParticipatingandConductingGroupdiscussions. Brain Storming, e– Meetings, preparing agenda and minutes of the meeting
5	**BUSINESS COMMUNICATION** BusinessLetters:Inquiries,Circulars,Quotations,Orders,AcknowledgmentsExecutions,Complaints, Claims &Adjustments, Collection letter, Banking correspondence, Agency correspondence, Bad news and persuadingletters,Salesletters,Jobapplicationletters-Bio-data,CoveringLetter,InterviewLetters,Letter of Reference. Memos, Minutes, Circulars & Notices.

6	**SKILL DEVELOPMENT**
	Conduct a mock meeting and draft minutes of the meeting.
	Draft a letter of enquiry to purchase a laptop.
	Draft your bio-data.
	Prepare your Career Plan.

References

1. Kulbhushan Kumar, Effective Communication Skills, Khanna Publishing House
2. Rai & Rai–Soft Skill for Business, HPH
3. Santhosh Kumar–Soft Skill for Business, VBH.
4. C.G.G Krishnamacharyulu & Lalitha: Soft Skills of Personality Development, HPH.
5. Lesikar, R.V. &Flatley, M.E. (2005). Basic Business Communication Skills for Empowering the Internet Generation. Tata McGraw Hill Publishing Company Ltd., New Delhi.
6. Rai & Rai:Business Communication Himalaya Publishing House
7. Rajkumar, Basic of Business Communication
8. Ludlow,R. & Panton,F.(1998). The Essence of Effective Communications. Prentice Hall of India Pvt. Ltd.
9. M.S. Rao: Soft Skills– Enhancing Employability I.K.International PH.
10. Rao& Das: Communication Skills, I.K.International PH.
11. Adair,J. (2003). Effective Communication. Pan McMillan.
12. Thill,J.V. &Bovee, G. L.(1993). Excellence in Business Communication. McGrawHill, New York.
13. Bowman,J.P.&Branchaw,P.P.(1987).BusinessCommunications:FromProcesstoProduct.Dryden Press, Chicago.
14. Sharma S.P.& Others, Business Communication, VBH.
15. Banerjee: Soft Skills Business and Professional Communication, I.K. International

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BSCDA- 202: INTRODUCTION TO STATISTICS AND PROBABILITY

Objectives

To enable the students to:

- Learn different Statistical theory and probability methods in practice
- Basic data analysis concepts and fundamentals of Probability

Units	Course Content
1	**Introduction to Probability:** Sample spaces, events and sets, Probability axioms and simple counting problems, permutations and combinations, Conditional probability, Independent events, partitions ad Bayes Theorem
2	**Discrete probability models:** Mass functions and distribution functions, expectation and variance, properties of expectations and variance, the binomial distribution, the geometric distribution, poisson distribution
3	**Continuous Probability Models**: PDF and CDF, Properties of continuous random quantities, the uniform distribution, the exponential distribution, the normal distribution, Normal approximation of binomial and poisson

References

1. Probability and Statistics, By TSR Murthy.
2. Probability and Statistics, By E.Rukmangadachari.
3. Elements of Probability and Statistics, By A.Baisnab and J.Das
4. Probability and Statistics for Engineers, By Rao V.Dukkipati
5. The Practice of Business Statistics, By Manisha Sharma & Amit Gupta

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BSCDA – 203: INTRODUCTION TO PROGRAMMING USING PYTHON

Objectives

To enable the students to:

- Understand basics of binary computation
- Understand the programming basics (operations, control structures, data types, etc.)
- Readily use the Python programming language
- Apply various data types and control structure
- Understand class inheritance and polymorphism
- Understand the object-oriented program design and development
- Understand and begin to implement code

Units	Course Content
1	**Python Basics** Introduction, your first program, type, expressions and variables, string operations, packages
2	**Python Data Structure** Lists and Truples, Sets, Directories
3	**Programming Fundamentals** Conditions and Branching, Loops, Functions, Object and Classes, Strings
4	**Python Database** Working with database
5	**Working with Data** Open/Reading/Writing files, Loading data with Pandas, Saving data with Pandas

References

1. Introduction to Programming in Python: An Interdisciplinary Approach, By Sedgewick, Wayne and Dondero
2. An Introduction to Python, By Guido Van Rossum.
3. Programming in Python 3: A Complete Introduction to Python Language, By Mark Summerfield
4. Programming in Python, By R.S. Salaria
5. Core Python Programming, By Dr R Nageshwar Rao
6. Introduction to Computing and Problem Solving in Python, By Dr. Jeeva Jose
7. Taming Python by Programming, By Dr. Jeeva Jose

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BSCDA – 204: LINEAR MATHEMATICS

Objectives

To enable the students to:

- solve systems of linear equations
- perform various operations with vectors and matrices, in particular, be able to calculate eigenspaces and apply such calculations to the diagonalization of matrices.
- apply linear algebraic methods to geometic problems in 2 and 3 dimensions.
- calculate trigonometric Fourier Series of elementary functions defined on finite intervals and sketch the periodic extensions of such functions
- demonstrate an understanding of concepts by use of examples or counter examples

Units	Course Content
1	**Systems of Linear Equations** Introduction to Systems of Linear Equations, Gaussian Elimination, Consistent and Inconsistent Systems. **Vectors** Vectors in the plane, Vectors in space, Applications to Geometry, n-component vectors, linear independence and bases, Gram-Schmidt Process Linear transformations
2	**Matrices** Matrices and Matrix Operations, Square Matrices, Determinants, Inverses, More Systems of Linear Equations **Eigenvectors** Eigenvalues, Eigenvectors and Diagonalization.
3	**Fourier Series** Function spaces, Orthogonal projections onto finite dimensional spaces. Calculation of trigonometric Fourier Series, Bessel's Inequality, Parseval's Identity

References

1. Linear Mathematics: A practical approach, By Patricia, Clark, Kenschaft

BSCDA – 205: ADVANCED MS EXCEL

Objectives

To enable the students to:

- Enable the students to use Excel productively

- Out of the box functionality usage to help you in reporting, project management,

- Gain insights from vast array of data with ease

- Analyze data like a professional

- Make powerful dashboards

- Write Awesome Formulas

Units	Course Content
1	**Getting started with MS-Office** **MS-Word:** Starting Word, Opening a saved Word document, Entering text, Previewing, Editing, Saving, Navigate, Scroll through text, Insert and delete text etc. **MS-PowerPoint:** Difference between presentation and Document, Using Power Point, Using Wizard for creating a presentation, Creation of Presentation, Title, Text Creation, Fonts and Sizes, Importing text from word documents, Moving to next Slide, The Slide manager, Animation effects, Slide Designs, Background and Text colors, Making your own slide format, Foot notes and slide numbering, Presentation of the Slides, Using the Slide Show, Printing the Slides and Handouts.
2	**Introduction to Microsoft Excel:** Concepts of Work book &Work sheets; Various Data Types; using different features with data, Cell and Texts; Inserting, Removing &Resizing of Columns &Rows; Working with Data and Ranges; entering data into worksheet, saving& quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and menu, keyboard shortcuts, Working with single and multiple workbook-copying, renaming, moving, adding and deleting, copy in gentries and moving between work books, Different Views of Work sheets; Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text;

3	**Formulas and Functions in Excel:** Use of Formulas, Calculations and Functions, Logical Functions, Text Functions, Lookups
4	**Advance Data Tools** Text to Column, Data Validation, What-if Analysis, Duplicate Removal, Data Sanitation
5	**Visualising data using charts in Excel** Basic Date visualisation, Charts in excel , dashboard in Excel
6	**Pivot table in Excel**
7	**Analytics using Excel** Data analysis using normal chart, Regression in Excel, correlation, stddev, average, ANOVA

References

1. Mastering MS Excel: Functions and Formulas, Webtech (Khanna Publications)
2. Excel Functions and Formulas, Bernd Held
3. Advance Excel 2016, training Guide, By Ritu Arora
4. MS Office 2010, training guide, Prof Satish Jain