



**OFFICE OF THE REGISTRAR :: DIBRUGARH UNIVERSITY :: DIBRUGARH**

Ref. No. DU/DR-A/Permission-Audit Courses/23/621

Date: 17.07.2023

**NOTIFICATION**

The 128<sup>th</sup> Meeting of the Academic Council, Dibrugarh University held on 30.06.2023 vide Resolution No. 09 has approved the Syllabus of the *Audit Courses on Mathematics* in First and Second Semesters of the Three Year Full Time Bachelor of Computer Application (BCA) Programme with effect from the academic session 2023-2024.

The syllabus is attached herewith.

Issued with due approval.

*Alaganta* 17/07/2023  
Deputy Registrar (Academic)  
Dibrugarh University.  
*Alaganta*

Copy to:

1. The Hon'ble Vice-Chancellor, Dibrugarh University for favour of information.
2. The Deans, Dibrugarh University, for favour of information.
3. The Registrar i/c, Dibrugarh University for favour of information.
4. The Chairperson, Centre for Computer Science and Applications, Dibrugarh University, for kind information and necessary action.
5. The Controller of Examinations, Dibrugarh University for kind information and necessary action.
6. The Programmer, Dibrugarh University for information and with a request to upload the notification in the Dibrugarh University Website.
7. File.

*Alaganta* 17/07/2023  
Deputy Registrar (Academic)  
Dibrugarh University  
*Alaganta*

**Syllabus of Two Audit Courses on Mathematics  
in the First and Second semesters of the  
3 year Full Time BCA programme in  
Choice Based Credit System (CBCS) under Dibrugarh University.**

**( For students without Mathematics/Statistics/Commercial  
Arithmetic at HS or equivalent level )**

**Foundation of Mathematics-I in Semester I of the BCA Programme  
Foundation of Mathematics- II in Semester II of the BCA Programme**

**As approved in the meeting of the Board of Studies (BoS)  
in Computer Science held on 21.06.2023.**

**To be effective from the session 2023-2024.**

| Course No:<br>BCA-Audit-I   | Course Name:<br>Foundation of Mathematics-I | Audit Course |
|---|---|--------------|
| <p><b>Objective:</b><br/>This course is designed with an objective to</p> <ul style="list-style-type: none"> <li>➤ Discuss fundamentals of mathematics</li> <li>➤ Discuss different methods of Basic Statistics</li> </ul> <p><b>Learning Outcome:</b><br/>After completion of the course, students will acquire</p> <ul style="list-style-type: none"> <li>➤ The basic Mathematical and Statistical ideas required for pursuing the different Courses of the BCA programme.</li> </ul>   |   |              |
| <p><b>Total Marks: 100</b><br/>( In Semester Evaluation –40 &amp; End Semester Evaluation –60)</p> <p><b>PART : A</b><br/>Total Marks: 50<br/>(End Semester: 30, In Semester: 20)</p>   |   |              |
| <p><b>Unit 1: Principle of Mathematical Induction: Marks-10</b></p> <p>Processes of proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers, The principle of mathematical induction and simple its applications.</p>  |   |              |
| <p><b>Unit 2: Binomial Theorem : Marks-10</b></p> <p>History, statement and proof of the binomial theorem for positive integral indices, Pascal’ striangle, general and middle term in binomial expansion, simple applications.</p>   |   |              |
| <p><b>Unit 3: Limits, Derivatives and Integration Marks: 10</b></p> <p>Derivative introduced as rate of change both as that of distance function and geometrically, intuitive idea of limit, Definitions of derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions. Concept of Integration, Integration as inverse process of differentiation, basic examples.</p>   |   |              |
| <p><b>Text and Reference Books</b></p> <ol style="list-style-type: none"> <li>1. C.V. Sastry , Rakesh Nayak, “ A Textbook on Discrete Mathematics” , 1<sup>st</sup> Edition, 2020, Wiley India Pvt Ltd</li> <li>2. Kenneth H. Rosen, “Discrete Mathematics and Its Applications”, 7<sup>th</sup> Edition, 2017, McGraw Hill Education</li> <li>3. Bandaru Ramana, “Higher Engineering Mathematics”, 1<sup>st</sup> Edition, 2017, McGraw Hill Education</li> <li>4. H. K. Das, “Advanced Engineering Mathematics”, 22<sup>nd</sup> Edition, 2019, S Chand Publishing</li> </ol> |   |              |



## **PART –B**

Total Marks: 50 :

(End Semester: 30, In Semester: 20)

### **Unit 1: Statistical Representation of Data**

**Marks:10**

Diagrammatic representation of data, Frequency distribution, Graphical representation of Frequency Distribution – Histogram, Frequency Polygon, Ogive, Pie-chart etc. Basic idea of Measures of Central Tendencies and Measures of Dispersions, Co-efficient of Variation, Skewness, Kurtosis etc.

### **Unit 2: Correlation and Regression**

**Marks:10**

Scatter diagram, Concept of Covariance, Karl Pearson's Coefficient of Correlation, Spearman's Rank Correlation, Idea of simple linear regression.

### **Unit 3: Time Series Analysis**

**Marks:10**

Concept of Time Series, Basic applications including methods, Components of time series, Trend, Seasonal variations.

### **Text and Reference Books**

1. Das N.G, "Statistical Methods ", 4<sup>th</sup> Edition 2012, Tata McGraw Hill
2. Gupta, S.P. "Statistical Methods", 5<sup>th</sup> Edition 2012, S Chand Sons publication
3. Agarwal B.L., "PROGRAMMED STATISTICS" ,New Age International Publication, 4<sup>th</sup> Edition, 2022
4. Shukla S.M., Sahai S.P., "Statistical Methods" ,Sahitya Bhawan, 2<sup>nd</sup> Edition, 2022

|                                   |   |                     |
|-----------------------------------|---|---------------------|
| <b>Course No:</b><br>BCA-Audit-II | <b>Course Name:</b><br>Foundation of Mathematics-II | <b>Audit Course</b> |
|-----------------------------------|---|---------------------|

**Objective:**

This course is designed with an objective to

- Discuss some basics of mathematics.

**Learning Outcome:**

- The basic Mathematical ideas required for pursuing the different Courses of the BCA programme.

**Total Marks: 100**

(In Semester Evaluation –40 & End Semester Evaluation –60)

**Unit 1: Differential Equations**

**Marks: 15**

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solution of homogeneous differential equations of first order and first degree.

**Unit 2: Vectors Marks-15**

Vectors and scalars, magnitude and direction of a vector. Direction cosines/ ratios of vectors. Types of vectors, position vector of a point, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Scalar (dot) product of vectors, Vector (cross) product of vectors.

**Unit 3: Straight Lines**

**Marks 15**

Slope of a line and angle between two lines, Various forms of equations of a line, parallel to axes, point-slope form, slope-intercept form, two-point form, intercept form and normal form, General equation of a line, Distance of a point from a line.

**Unit 4: Sequence and Series Marks 15**

Sequence and Series. Arithmetic progression (A.P.), arithmetic mean (A.M.), Geometric progression (G.P.), geometric mean (G.M.), general term of a G.P., sum of n terms of a GP., relation between A.M. and GM. Sum to n terms of the special series.

**Text and Reference Books:**

1. S L Loney, "The Elements of Coordinate Geometry", 6<sup>th</sup> edition 2016, Arihant Publications.
2. J G Chakravorty, P R Ghosh, "Vector Analysis: Vector Algebra & Vector Calculus", 11<sup>th</sup> Edition, 2018, U N Dhur & Sons Pvt Ltd.
3. H.C. Taneja, "Advanced Engineering Mathematics", 1<sup>st</sup> Edition, 2019, Dreamtech Press
4. Harold Cohen And Daniel Gallup, "Introduction to Differential Equations with Applications", 1<sup>st</sup> Edition, 2021, World Scientific.