



BENGALURU CITY UNIVERSITY

CHOICE BASED CREDIT SYSTEM

**(Semester Scheme with Multiple Entry and Exit Options for
Under Graduate Course)**

**Syllabus for B.Com (Business Data Analytics)
(V & VI Semester)**

2023-24 onwards

**PROCEEDINGS OF THE MEETING OF THE BOS-UG-B.COM, B.COM BDA /IAS
/A&F/ LSCM /TTM, B.VOC (A&T)/B.VOC (RM) COURSES**

Proceedings of the meeting of the BOS(UG) B.Com/B.Com-BDA/B.Com-IAS / B.Com-A&F/B.Com-LSCM/B.Com-TTM/B.Voc(A&T)/B.Voc(RM) Courses held on 8th and 9th August 2023 from 11:00 AM onwards, in the Department of Commerce, PK Block, Bengaluru City University, Bengaluru.

The board members had prepared the draft syllabus for the 5th and 6th semesters of the above mentioned courses and presented in the meeting. After elaborate discussions and deliberations, the draft syllabus was modified as per the suggestions of the board members and finalised.

Further, the board authorised the Chairperson to make the necessary changes, if required.

MEMBERS PRESENT:

1.	Dr. Jalaja .K.R	Dean and Chairperson , Department Of Commerce, BCU	Chairperson
2.	Dr. M. Muniraju	Former Dean and Chairman, Department Of Commerce, BCU	Member
3.	Dr. R. Sarvamangala	Dean and Chairperson , Department Of Commerce, BUB	Members
4.	Dr. Nagaraju. N	Professor, Department Of Commerce, Mangaluru University, Mangaluru	Members
5.	Dr. Channappa	Professor, Department Of Commerce, Osmania University, Hyderabad.	Member
6.	Dr. B. G. Bhaskara	Principal , Sheshadripuram College, Bengaluru	Member
7.	Dr. Padmaja. P.V	Principal , MLA Academy of Higher Education, Bengaluru	Member
8.	Dr. Parvathi	Principal, VET First Grade College, Bengaluru	Member
9.	Dr. S. N. Venkatesh	Principal, Sheshadripuram College, Yelahanka, Bengaluru	Member
10.	Dr. S. Harish	Principal, Vijaya Evening College, Bengaluru	Member
11.	Dr. D. Raja Jebasingh	Associate Professor, Department Of Commerce, St Joseph's College of Commerce ,Bengaluru	Member

CO-OPTED MEMBERS:

12.	Dr. G. Venugopal	Principal VVN Degree College, Bengaluru	Member
13.	Dr. Bhavani.H	Associate Professor, Department of Commerce, Vivekananda Degree College ,Bengaluru	Member
14.	Shri. Gururaja Rao. H.N	Associate Professor, Department of Commerce, Vijaya College, Bengaluru	Member
15.	Dr. Savitha.K	Principal, BEL First Grade College, Bengaluru	Member
16.	Dr. Swaminathan C	Associate Professor, Department of Commerce, GFGC, Malleshwaram, Bengaluru	Member
17.	Dr. Padmanabha. H.R	Principal, ASC Silver Valley College, Bengaluru	Member
18.	Dr. Srihari	Associate Professor, Department of Commerce, SSMRV College, Bengaluru	Member
19.	Dr. Nagaraja. C	Assistant Professor, Department of Commerce, GFGC Yelahanka, Bengaluru	Member
20.	Smt. Asha. N	Principal, Sindhi College, Bengaluru	Member
21.	Smt. Priya Srinivasa	Assistant Professor, Department of Commerce, BMS College of Commerce and Management, Bengaluru	Member

bibi 12/09/23
Dr. JALAJA. K R. M.COM., MBA., Ph.D
Dean & Chairperson
Department of Commerce
Bengaluru City University
CS ScanScanner

Chairperson- BOS(UG)

B.COM (BUSINESS DATA ANALYTICS)

Semester V								
Sl. No.	Course Code	Title of the Course	Category of Courses	Teaching Hours/ Week (L + T +	SEE	CIE	Total Marks	Credits
37	COM 5.1	Financial Management	DSC-13	3+0+2	60	40	100	4
38	COM 5.2	Income Tax Law and Practice-I	DSC-14	3+0+2	60	40	100	4
39	COM 5.3	Financial markets and services	DSC-15	4+0+0	60	40	100	4
40	COM 5.4	Business Data Analytics	DSC-16	3+0+2	60	40	100	3
41	COM 5.5	Introduction to 'R'	DSC-17	3+0+2	60	40	100	3
42	COM 5.6	C Programming	Vocational-1	3+0+2	60	40	100	4
43	COM 5.7	Cyber Security OR Employability Skills	SEC - SB	2+0+2	60	40	100	3
Sub –Total (E)					420	280	700	25
Semester VI								
Sl. No.	Course Code	Title of the Course	Category of Courses	Teaching Hours/ Week (L + T +	SEE	CIE	Total Marks	Credits
44	COM 6.1	Management Accounting	DSC-18	3+0+2	60	40	100	4
45	COM 6.2	Income Tax Law and Practice-II	DSC-19	3+0+2	60	40	100	4
46	COM 6.3	Fundamentals of Cost Accounting	DSC-20	3+0+2	60	40	100	4
47	COM 6.4	Marketing Analytics	DSC-21	3+0+2	60	40	100	3
48	COM 6.5	Application of Python in Business decisions	DSC-22	3+0+2	60	40	100	3
49	COM 6.6	Data Analysis using Tableau	Vocational-2	3+0+2	60	40	100	4
50	COM 6.7	Internship	3 Hours per Teacher for a batch of 50 students	1+0+2		100	100	3
Sub –Total (F)					360	340	700	25

Note: The students shall undergo 4 weeks of internship programme in any business organization (Tiny, small, medium or large scale) immediately after completion of the 4th Semester Examination but 45 Days before the end of 6th Semester classes and shall submit internship report to the College. Colleges shall submit internship report marks along with 6th Semester Internal Assessment marks.

- Marks allotted for Internship (100) shall be split into 60 marks for report and 40 marks for Viva-voce. Evaluation of report and conduct of Viva- voce shall be at the institutional level.
- 01 hour of Internship class shall be taken in the classroom for explaining and guiding on internship and 02 hours of Practical class shall be used to monitor the Internship Course.

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA .5.1 Name of the Course: Financial Management		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classrooms lecture, Case studies, Tutorial Classes, Group discussion, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students' will be able to <ol style="list-style-type: none"> Understand the role of financial managers effectively in an organization. Apply the compounding & discounting techniques for time value of money. Take investment decisions with appropriate capital budgeting techniques for investment proposals. Understand the factors influencing the capital structure of an organization. Estimate the working capital requirement for the smooth running of the business 		
Syllabus:		Hours
Module No. 1: Introduction to Financial Management		12
Introduction –Meaning of Finance, Finance Function, Objectives of Finance function, Organization of Finance function -Meaning and definition of Financial Management; Goals of Financial Management, Scope of Financial Management, Functions of Financial Management, Role of Finance Manager in India. Financial planning-- Meaning –Need – Importance -Steps in financial Planning – Principles of a sound financial plan and Factors affecting financial plan.		
Module No. 2: Time Value of Money		10
Introduction – Meaning of time value of money-time preference of money- Techniques of timevalue of money: Compounding Technique-Future value of Single flow, Multiple flow and Annuity -Discounting Technique-Present value of Single flow, Multiple flow – and Annuity. Doubling Period- Rule 69 and 72.		
Module No. 3: Financing Decision		14
Introduction-Meaning and Definition of Capital Structure, Factors determining the Capital Structure, Concept of Optimum Capital Structure, EBIT-EPS Analysis- Problems. Leverages: Meaning and Definition, Types of Leverages- Operating Leverage, Financial Leverage and Combined Leverages – Theory and Problems.		
Module No. 4: Investment Decision		12
Introduction-Meaning and Definition of Capital Budgeting, Features, Significance – Steps in Capital Budgeting Process. Techniques of Capital budgeting: Traditional Methods – Pay Back Period, and Accounting Rate of Return – DCF Methods: Net Present Value Internal Rate of Return and Profitability Index - Theory and Problems.		
Module 5: Working Capital Management		12
Introduction- Meaning and Definition, types of working capital, Operating cycle, Determinants of working capital needs – Estimation of working capital requirements. dangers of excess and inadequate working capital, Merits of adequate working capital, Sources of working capital. Cash Management, Receivable Management and Inventory Management (Concepts only).		

Skill Development Activities:

1. Prepare the list of Functions of Finance Manager.
2. As a finance manager of a company, design an appropriate Capital Structure.
3. Evaluate a capital investment proposal by using NPV method with imaginary figures.
4. Calculate EBIT and EPS with imaginary figures.
5. Calculate PBP with imaginary figures of Uneven Cash inflow for three years.

Books for reference:

- IM Pandey, Financial management, Vikas publications, New Delhi.
- Abrish Guptha, Financial management, Pearson.
- Khan & Jain, Basic Financial Management, TMH, New Delhi.
- S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons, New Delhi.
- Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI, New Delhi.
- Ravi M Kishore, Financial Management, Taxman Publications
- Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA .5.2 Name of the Course: Income Tax Law and Practice – I		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students will be able to		
a) Understand the basic concepts of Income Tax as per Income Tax Act 1961. b) Understand the provisions for determining the residential status of an Individual. c) Comprehend the meaning of Salary, Perquisites, allowances and Profit in lieu of salary, and various retirement benefits. d) Compute the income of house property for different categories of house property. e) Comprehend the assessment procedure and to know the power of income tax authorities.		
Syllabus:		Hours
Module No. 1: Basic Concepts of Income Tax		08
Introduction –Meaning of tax-, types of taxes and canons of taxation, Important definitions, assessment year, previous year including exceptions, assesses, person, income, casual income, Gross total income, Total income, Agricultural income, Tax Rates (Old and New Regimes). Exempted incomes of individuals under section 10.		
Module No. 2: Assessment Procedure and Income Tax Authorities		08
Meaning of Assessment - Types of Assessment– Regular Assessment- Self Assessment – Best Judgement Assessment- Summary Assessment – Scrutiny Assessment – Income Escaping Assessment - Permanent Account Number -Meaning, Procedure for obtaining PAN and transactions were quoting of PAN is compulsory. Income Tax Authorities their Powers and functions. CBDT, CIT and AO.		
Module No. 3: Residential Status and Incidence of Tax		10
Introduction – Residential status of an individual. Determination of residential status of an individual. Incidence of tax or Scope of Total income. Problems on computation of Gross total Income of an individual (excluding deductions U/S 80)		
Module No. 4: Income from Salary		18
Introduction - Meaning of Salary -Basis of charge Definitions–Salary, allowances, Perquisites and profits in lieu of salary - Provident Fund - Retirement Benefits – Gratuity, pension and Leave salary. Deductions U/S 16 and Problems on Computation of Taxable Salary.		
Module No. 5: Income from House Property		12
Introduction - Basis of charge - Deemed owners -House property incomes exempt from tax, Vacancy allowance and unrealized rent. Annual Value –Determination of Annual Value- Deductions U/S 24 from Net Annual Value - Problems on Computation of Income from House Property.		

Skill Developments Activities:

1. Prepare slab rates chart for different Individual assesses (Old Regime).
2. List out any 6 Incomes exempt from tax under section 10 of an Individual.
3. Draw an organization chart of Income Tax Authorities.
4. Prepare the chart of perquisites received by an employee in an organization.
5. Prepare the chart of Computation of Income under House Property.

Books for Reference:

- Mehrotra H.C and T.S. Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
- Vinod K. Singhanian, Direct Taxes, Taxman Publication Private Ltd, New Delhi.
- Gaur and Narang, Law and practice of Income Tax, Kalyani Publications, Ludhiana.
- Bhagawathi Prasad, Direct Taxes.

Name of the Programme: Bachelor of Commerce (Data Analytics)		
Course Code: B.Com. BDA .5.3		
Name of the Course: Financial Markets & Services		
Course Credits	No. of Hours per Week	Total No of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classrooms lecture, Case studies, Tutorial classes, Group discussions, Seminar & field work etc.,		
Course Outcomes: On successful completion of the course, the students will be able to:		
a) Understand the Overview of Indian financial system.		
b) Understand the different types of financial institutions and their role.		
c) Understand concept of financial services, types and functions.		
d) Understand the different types of financial Instruments and its features.		
e) Understand the different types of financial market and its role.		
Syllabus		Hours
Module No. 1: Overview of Indian Financial System		08
Introduction to Financial System – Features, Constituents of Financial System; Financial Institutions; Financial Services; Financial Markets and Financial Instruments, Financial Regulators (a brief profile of RBI, SEBI, IRDAI).		
Module No. 2: Financial Institutions		14
Meaning, Need for Financial Institutions; Banks – Meaning, Types of Banks, Role of Banks, Insurance Companies – Meaning, Types of Insurance, Role of Insurance; NBFC’S – Meaning, Types of NBFC’s , Role of NBFC’s, EXIM Bank –Meaning, Role and Objectives; Asset Management Companies (AMC) – Meaning, Role of AMC in Mutual Funds.		
Module No. 3: Financial Services		12
Financial Services – Meaning, Objectives, Functions, Characteristics; Types of Financial Services - Merchant Banking – Functions and Operations, Leasing, Factoring, Bill Discounting, Credit Card, Debit Card, Loans and Advances –Meaning and Types, Venture Capital & Credit Rating.		
Module No. 4: Financial Markets		12
Meaning and Definition, Types of Financial Markets, Role and Functions of Financial Markets, Constituents of Financial Markets- Money Market, Capital Market – Primary and Secondary Market, Methods of Issue of shares in the primary market, -Stock Exchange – Role and Function of Stock Exchange.		
Module No. 5: Financial Instruments		10
Meaning, Types of Instruments-Money Market Instruments-Commercial Paper, CD’s Treasury Bills, Promissory Notes, Bills of Exchange, Money at Call and Short Notice; Capital Market and Instruments- Equity Shares, Preference Shares, Debenture/ Bonds, Public Deposits.		

Skill Development Activities:

1. Prepare a List of Private Banks in India
2. Draft a specimen of Bills of Exchange with imaginary content
3. Prepare a List of Fund Based and Fee-Based Financial Services.
4. Draft a Chart of the Financial Market

Books for References:

- L.M. Bhole, Financial Institutions & Markets, McGraw Hill
- Khan, M.Y, Indian Financial System, McGraw Hill
- Sharma, Meera, Management of Financial Institutions, Eastern Economy Edition
- Bhole and Mahakud, Financial Institutions and Markets – Structure, Growth and Innovations, McGraw Hill
- Guruswamy, S., Financial Services and System, McGraw Hill
- Edminister. R.O, Financial Institutions, Markets & Management, McGraw Hill
- Khan. M.Y, Indian Financial System, Vikas Pub. House
- H.R Machiraju, Indian Financial System, Vikas Pub. House
- E.Gorden & K. Nataraj, Financial Markets and Services, HPH

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA .5.4 Name of the Course: Business Data Analytics		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classrooms lecture, Case studies, Group discussions, Seminar & field worketc.,		
Course Outcomes: On successful completion of the course, the students' will be able to a) Differentiate between the four main types of analytics: Descriptive, Diagnostic, Predictive, and Prescriptive. b) Handle the Data in R studio software c) Perform the statistical analysis using R software d) Perform the predictive modelling using JASP software e) Define the prescriptive analytics		
Syllabus:		Hours
Module No. 1: Introduction to Business Analytics		10
Definition and importance of business analytics, Types of analytics: Descriptive, Diagnostic, Predictive, Prescriptive, the analytics process model, role of data in business decision making.		
Module No. 2: Data Management and Preprocessing		10
Importance of data quality, Data sourcing and collection techniques, Data cleaning and preprocessing, handling missing data, Transformation and normalization using Excel and R Software, Introduction to data warehousing (Concept Only)		
Module No. 3: Statistical Analysis and Visualization		12
Descriptive statistics in business analytics, Probability and probability distributions, Hypothesis testing and inference, Correlation and regression analysis using R software. Introduction to data visualization, Visualization tools and best practices using Power BI software.		
Module No. 4: Predictive Modeling and Machine Learning		12
Introduction to predictive modelling, Linear regression and logistic regression, Classification techniques: Decision Trees, Random Forests, Naïve Bayes, etc., using JASP and R software. Clustering and segmentation, Basics of neural networks and deep learning (Theory only), Model validation and evaluation metrics using Python software.		
Module 5: Prescriptive Analytics and Decision Optimization		12
Introduction to prescriptive analytics, Linear and integer programming, Simulation and risk analysis (Theory only), Decision analysis and decision trees using R software, Multi-criteria decision-making, Applications of prescriptive analytics in business contexts (Theory Only)		

Skill Development Activities:

1. Write the different types of analytics
2. Write the steps in data cleaning using Excel and R
3. Write the different types of charts available in Power BI
4. Differentiate between Neural Network and Deep Learning
5. Write the codes for Decision tree in R studio

Books for Reference:

- Data Science for Business" by Foster Provost and Tom Fawcett
- Data Wrangling with Python" by Jacqueline Kazil and Katharine Jarmul
- Business Analytics: Data Analysis & Decision Making" by S. Christian Albright and Wayne L. Winston
- Spreadsheet Modeling and Decision Analysis" by Cliff Ragsdale
- Practical Statistics for Data Scientists" by Peter Bruce and Andrew Bruce
- Storytelling with Data" by Cole Nussbaumer Knaflic
- Pattern Recognition and Machine Learning" by Christopher M. Bishop
- An Introduction to Statistical Learning" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani

Name of the Program: Bachelor of Commerce (Data Analytics)		
Course Code: B.Com. BDA .5.5		
Name of the Course: Introduction to R		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial Classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students will be able to		
a) Understand the evolution and importance of the R programming language in Data Analytics.		
b) Understand and differentiate between various data types and structures in R, including vectors, matrices, lists, data frames, and factors.		
c) Conduct Exploratory Data Analysis (EDA) using R, leveraging descriptive statistics and data visualization techniques with 'ggplot2'.		
d) Understand and apply various probability distributions such as binomial, poisson, and normal distributions.		
e) Grasp fundamental concepts of machine learning and its relevance in business scenarios.		
Syllabus:		Hours
Module No. 1: Introduction to R and Data Analytics		12
Background and Importance of Data Analytics, Definition of Data Analytics, Applications in Commerce and Business, Role of R in Data Analytics. Introduction to the R Programming Language- History and Development of R - Features and Capabilities, Importance in Statistical Analysis. Setting up R and RStudio- Installation Process, Navigating the RStudio Interface, Basic R Commands.		
Module No. 2: Basics of R Programming		08
Data Types and Structures in R- Vectors, Matrices, Lists, Data Frames, Factors. Basic Operations in R- Arithmetic Operations, Logical Operations, Relational Operations, Flow Control Statements- if, else, and else if, for loop, while loop, repeat loop.		
Module No. 3: Data Manipulation and Exploration in R		12
Data Importing and Exporting- Reading Data from CSV, Excel, and Databases. Writing Data to Different Formats, Data Cleaning and Transformation- Handling Missing Values- Data Transformation using dplyr- Aggregating Data. Exploratory Data Analysis (EDA)- Descriptive Statistics - Visualizing Data using ggplot2- Correlation and Covariance.		
Module No. 4: Statistical Analysis in R		12
Basics of Statistical Analysis- Probability Distributions (Binomial, Poisson, Normal)- Hypothesis Testing- Confidence Intervals. Regression Analysis- Simple Linear Regression- Multiple Linear Regression- Assessing Model Fit. Other Advanced Techniques- ANOVA (Analysis of Variance)- Non-parametric Tests- Time Series Analysis (basic introduction)		
Module No. 5: Machine Learning with R		12
Introduction to Machine Learning in R- Basic Concepts and Importance in Business- Simple Algorithms: K-means Clustering, Decision Trees- Introduction to R packages like caret and random Forest.		

Skill Development Activities:

1. Write the steps for the Installation of R studio programs.
2. Write the basics codes for Data frame, Logical operation, relational operational with imaginary data.
3. Write the steps for data cleaning and data transformation using excel.
4. Write the difference between the simple regression and multiple regression.
5. Write the importance of machine learning in business

Books for Reference:

- "R for Data Science" by Hadley Wickham & Garrett Grolemund
- "Data Science for Business" by Foster Provost and Tom Fawcett
- "The Art of R Programming" by Norman Matloff
- "R in Action" by Robert Kabacoff
- "Data Wrangling with R" by Bradley Boehmke
- "Practical Statistics for Data Scientists" by Peter Bruce & Andrew Bruce
- "Statistical Analysis with R For Dummies" by Joseph Schmuller
- "Machine Learning with R" by Brett Lantz
- "Introduction to Statistical Learning" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA 5.6 (Vocational Course-1) Name of the Course: Fundamentals of C Programming		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students' will be able to		
a) Understand the foundational concepts of C programming. b) Develop, compile, and execute basic C programs. c) Utilize data structures effectively for data storage and retrieval. d) Implement file operations for data analytics applications. e) Apply C programming skills to basic data analytics tasks.		
Syllabus:		Hours
Module No. 1: Introduction to C Programming		10
Introduction to Programming- What is programming? -Role of programming in data analytics-Difference between compiled and interpreted languages. Introduction to C Language-History and importance of C- Structure of a C program-Compilation and execution process. Basic I/O Operations- printf() and scanf() functions, Reading and displaying data.		
Module No. 2: Data Types and Operators		10
Data Types -Basic data types: int, float, char, double-Derived data types: arrays, structures, unions, pointers. Variables and Constants-Declaration and initialization-Scope and lifetime. Operators-Arithmetic operators-Relational operators-Logical operators-Assignment operators-Bitwise operators-Conditional (ternary) operators.		
Module No. 3: Control Structures and Functions		10
Control Structures-Decision-making statements: if, if-else, switch. Looping statements: for, while, do-while. Jump statements: break, continue, goto. Functions-Introduction to functions-Types of functions: standard library and user-defined functions- Function declaration, definition, and call, Scope and lifetime of function variables, Recursion.		
Module No. 4: Data Structures in C		10
Arrays- Introduction to arrays, Types of arrays: single-dimensional and multi-dimensional-Operations on arrays: insertion, deletion, traversal. Strings Introduction to strings, String operations: length, compare, concatenate, copy. Pointers-Introduction to pointers, Pointer arithmetic, Pointers with arrays, strings, and functions. Structures and Unions-Defining structures and unions, Accessing members		
Module No. 5: File Operations and Applications in Data Analytics		20
File Handling-Introduction to files-Types of files: text and binary-File operations: open, close, read, write, seek. Applications in Data Analytics-Basic data preprocessing using C- Data visualization basics-Introduction to searching and sorting algorithms, File-based data analytics: reading datasets, basic statistical calculations.		

Skill Development activities:

1. Write the basic data types
2. Explain the various types of functions in C programme
3. List out the different types of arrays
4. Write a note on the searching and sorting algorithm
5. Explain string operations

Books for Reference:

- "The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie
- "C: The Complete Reference" by Herbert Schildt
- "Data Analysis with C" by Tony Fischetti
- "Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne
- "Introduction to Information Systems: Supporting and Transforming Business" by R. Kelly Rainer & Brad Prince
- "Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan
- "C Programming Absolute Beginner's Guide (3rd Edition)" by Greg Perry and Dean Miller
- "Programming in ANSI C" by E. Balagurusamy
- "C Programming for the Absolute Beginner" by Michael Vine
- "Pointers in C: A Hands on Approach" by Hrishikesh Dewan & Naveen Toppo.

SEMESTER VI

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA.6.1 Name of the Course: Management Accounting		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial Classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students' will be able to <ol style="list-style-type: none"> a) Demonstrate the significance of management accounting in decision making. b) Analyse and interpret the corporate financial statements by using various techniques. c) Compare the financial performance of corporates through ratio analysis. d) Understand the latest provisions in preparing cash flow statement. e) Understand the concepts of Budgetary Control. 		
Syllabus:		Hours
Module No. 1: Introduction to Management Accounting		10
Meaning and Definition – Objectives – Nature and Scope– Role of Management Accountant - Relationship between Financial Accounting and Management Accounting - Relationship between Cost Accounting and Management Accounting - Advantages and Limitations of Management Accounting. Management Reporting– Principles of Good Reporting System.		
Module No. 2: Analysis of Financial Statements		12
Analysis of Financial Statements: Meaning and Importance of Financial Statement Analysis - Methods of Financial Analysis – Problems on Comparative Statement analysis – Common Size Statement analysis and Trend Analysis.		
Module No. 3: Ratio Analysis		10
Meaning and Definition of Ratio and Ratio Analysis – Uses and Limitations of ratios – Classification of Ratios: Turnover ratio - Liquidity ratios - Profitability ratios and Solvency ratios. Problems.		
Module No. 4: Cash flow Analysis		12
Meaning and Definition of Cash Flow Statement – Concept of Cash and Cash Equivalents - Uses of Cash Flow Statement – Limitations of Cash Flow Statement– Provisions of Ind. AS-7. Procedure for preparation of Cash Flow Statement – Cash Flow from Operating Activities – Cash Flow from Investing Activities and Cash Flow from Financing Activities – Preparation of Cash Flow Statement according to Ind. AS-7.		
Module No. 5: Budgetary Control		12
Introduction – Meaning & Definition of Budget and Budgetary Control – Objectives of Budgetary Control – essential requirements of budgetary control – advantages and disadvantages of budgetary control – Types of budgets- Functional Budgets - Cash budget, sales budget, purchase budget and production budget. Fixed and Flexible budgets - Problems on Flexible budget and Cash budget only.		

Skill Development Activities:

1. Prepare with imaginary figures a Flexible or Cash budget.
2. Prepare with imaginary figures comparative statement and analyse the financial position.
3. Prepare with imaginary figures statements of any one corporate entity, analyse the same by using ratio analysis.
4. Prepare with imaginary figures cash flow statement
5. Prepare a Trend analysis statement for three years with imaginary figures.

Books for Reference:

- Charles T. Horngren, Gary L. Sundem, Dave Burgstahler, Jeff O. Schatzberg, Introduction to Management Accounting, Pearson Education.
- Khan, M.Y. and Jain, P.K. Management Accounting. McGraw Hill Education.
- Arora, M.N. Management Accounting, Vikas Publishing House, New Delhi
- Maheshwari, S.N. and S.N. Mittal, Management Accounting. Shree Mahavir Book Depot, New Delhi.

Name of the Program: Bachelor of Commerce (Data Analytics)**Course Code: B.Com. BDA.6.2****Name of the Course: Income Tax Law & Practice – II**

Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussions, Seminar & field work etc.,		
Course Outcomes: On successful completion of the course, the students will be able to		
a) Understand the procedure for computation of income from business and other Profession. b) Understand the provisions for computation of capital gains. c) Learn to compute the taxable income from other sources. d) Learn the computation of total income of an Individual. e) Understand the provisions relating to Set Off and Carry Forward of Losses		
Syllabus:		Hours
Module No. 1: Profits and Gains of Business and Profession		16
Introduction-Meaning and definition of Business, Profession and Vocation. - Expenses Expressly allowed - Expenses Expressly Disallowed - Allowable losses - Expressly disallowed expenses and losses, Expenses allowed on payment basis. Problems on computation of income from business of a sole trading concern - Problems on computation of income from profession: Medical Practitioner - Advocate and Chartered Accountants.		
Module No. 2: Capital Gains		12
Introduction - Basis for charge - Capital Assets - Types of capital assets – Transfer - Computation of capital gains – Short term capital gain and Long term capital gain - Exemptions under section 54, 54B, 54EC, 54D and 54F. Problems covering the above sections.		
Module No. 3: Income from other Sources		10
Introduction - Incomes taxable under Head income other sources – Securities - Types of Securities - Rules for Grossing up. Ex-interest and cum-interest securities. Bond Washing Transactions - Computation of Income from other Sources.		
Module No. 4: Set Off and Carry Forward of Losses and Deductions from Gross Total Income.		10
Meaning- Provisions of Set off and Carry Forward of Losses (Theory only) Deductions under Sections 80C, 80CCC, 80CCD, 80CCG, 80D, 80DD, 80ddb, 80E, 80G, 80GG, 80TTA, 80TTB and 80U as applicable to Individuals.		
Module No. 5: Computation of Total Income and Tax Liability		08
Computation of Total Income and tax liability of an Individual assessee under Old Regime.		

Skill Development activities:

1. Mention the procedure involved in the computation of income from profession.
2. List out the different types of capital assets and identify the procedure involved in the computation of tax for the same.
3. List out the steps involved in the computation of income tax from other sources and critically examine the same.
4. List any 6 deductions available under section 80
5. Prepare a format for computation of taxable income and tax liability of an individual assessee

Books for Reference:

- Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
- Vinod K. Singhanian, Direct Taxes, Taxman Publication Private Ltd, New Delhi
- Gaur and Narang, Law and practice of Income Tax, Kalyani Publication, Ludhiana.
- Bhagawathi Prasad, Direct Taxes.

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA.6.3 Name of the Course: Cost Accounting		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students will be able to		
a) Demonstrate an understanding of the concepts of costing and cost accounting. b) Classify, allocate apportion overheads and calculate overhead absorption rates. c) Demonstrate the ability to calculate labour cost. d) Demonstrate the ability to prepare a cost sheet. e) Prepare material-related documents, understand the management of stores and issue procedures		
Syllabus:		Hours
Module No. 1: Introduction to Cost Accounting		12
Introduction- Meaning and definition- Objectives, Importance and Uses of Cost Accounting, Difference between Cost Accounting and Financial Accounting; Various Elements of Cost and Classification of Cost; Cost object, Cost unit, Cost Centre; Cost reduction and Cost control. Limitations of Cost Accounting. Cost Sheet - Meaning and Cost heads in a Cost Sheet, Presentation of Cost Information in Cost Sheet. Problems on Cost Sheet, Tenders and Quotations.		
Module No. 2: Material Cost		12
Materials: Meaning, Importance and Types of Materials – Direct and Indirect Materials Procurement- Procedure for procurement of materials and documentation involved in materials accounting; Material Storage: Duties of Store keeper; Pricing of material issues Preparation of Stores Ledger Account under FIFO, LIFO, Simple Average Price and Weighted Average Price Methods – Problems. Materials control. - Technique of Inventory Control - Problems on Level Setting and EOQ.		
Module No. 3: Labour Cost		8
Labour Cost: Meaning and Types of labour cost –Attendance procedure-Time keeping and Time booking and Payroll Procedure; Idle Time- Causes and Treatment of Normal and Abnormal Idle time, Over Time- Causes and Treatment (theory only). Labour Turnover: Meaning, Reasons and Effects of labour turnover Methods of Wage Payment: Time rate system and piece rate system; Incentive schemes - Halsey plan, Rowan plan –problems based on calculation of wages and earnings only.(No Cost sheet related problems)		
Module No. 4: Overheads		14
Overheads: - Meaning and Classification of Overheads; Accounting and Control of Manufacturing Overheads: Collection, Allocation, Apportionment, Re-apportionment and Absorption of Manufacturing Overheads; Problems on Primary and Secondary overheads distribution using Reciprocal Service Methods (Repeated Distribution Method and Simultaneous Equation Method); Absorption of Overheads: Meaning and Methods of Absorption of Overheads (Concept only); Problems on calculation of Machine Hour Rate.		
Module No. 5: Marginal Costing		10
Meaning and Definition – Need for Marginal Costing - Advantages & Limitations. Preparation of Marginal Cost statement. Break–even Analysis: Meaning, Calculation of P/V ratio, Calculation of Break-Even point, Calculation of margin of safety, Preparation of Break-Even Chart.		

Skill Development activities:

1. Mention the causes of labour turnover in manufacturing organisations.
2. Name any five documents used for material accounting
3. Prepare a dummy Payroll with imaginary figures.
4. List out the various overhead items under Factory, administrative, Selling & distribution overheads (six items each).
5. Prepare a cost sheet with imaginary figures.

Books for Reference:

- Jain, S.P. and K.L. Narang. Cost Accounting: Principles and Methods. Kalyani Publishers
- Arora, M.N. Cost Accounting – Principles and Practice, Vikas Publishing House, New Delhi.
- Maheshwari, S.N. and S.N. Mittal. Cost Accounting: Theory and Problems. Shri Mahavir Book Depot, New Delhi.
- Iyengar, S.P. Cost Accounting, Sultan Chand & Sons
- Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, Cost Accounting: A Managerial Emphasis, Pearson Education.
- Jawahar Lal, Cost Accounting., McGraw Hill Education
- Madegowda J, Cost Accounting, HPH.
- Rajiv Goel, Cost Accounting, International Book House

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA.6.4 Name of the Course: Marketing Analytics		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students' will be able to <ol style="list-style-type: none"> 1. Concepts of Marketing Analytics 2. How to install R and its libraries 3. Perform the Descriptive statistics using R 4. Apply regression model for prediction 5. Define the application of marketing analytics in marketing 		
Syllabus:		Hours
Module No. 1: INTRODUCTION TO MARKETING ANALYTICS AND DATA MINING		12
Introduction to Marketing Analytics, Need of Marketing Analytics, Benefits of Marketing Analytics, Data mining –Definition, Classes of Data mining methods – Grouping methods, Predictive modeling methods, Linking methods to marketing applications. Process model for Data mining – CRISP DM.		
Module No. 2: INTRODUCTION TO R		8
About R, Data types and Structures, Data coercion, Data preparation: Merging, Sorting, Splitting, Aggregating, Introduction to R Libraries – How to install and invoke, Introduction to R Graph – Basic R charts – Different types of charts.		
Module No. 3: DESCRIPTIVE ANALYTICS		12
Exploratory Data Analysis using summary table and various charts to find the insights, slicing and dicing of the Customer data. Inferential Statistics: T-Test, ANOVA, Chi-Square using marketing data and exploring relationship (Correlation)		
Module No. 4: PREDICTION AND CLASSIFICATION MODELLING USING R		12
Introduction to Prediction and Classification modelling, data splitting for training and testing purposes, Prediction modelling: Predicting the sales using Moving Average Model and Regression Model (Simple and Multiple Regression model), Classification modelling: Customer churn using Binary logistic regression and decision tree.		
Module No. 5: APPLICATION OF ANALYTICS IN MARKETING		12
Association Rules – Market Basket Analysis for Product Bundling and Promotion, RFM (Recency Frequency Monetary) Analysis, Customer Segmentation using K-Means Cluster Analysis, Key Driver Analysis using Regression Model.		

Skill Development activities:

1. Write the process for Data Mining
2. Write the steps for installing R software and libraries
3. Explain the difference between t-test and ANOVA
4. Write the steps in applying binary logistics regression using R studio
5. Explain the Key Driver Analysis using the Regression Model.

Books for Reference:

- Marketing Analytics: Data-Driven Techniques with Microsoft® Excel® Published by John Wiley & Sons, Inc
- Marketing Data Science, Thomas W. Miller Published by Pearson
- Marketing Metrics, Neil T Bendle, Paul W. Farris, Phillip E. Pfeifer published by Pearson
- Marketing Analytics, Mike Grigsby published by Kogan Page

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA.6.5 NAME OF THE COURSE: Application of Python In Business Decisions		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
3 Credits	4 Hrs.	56 Hrs.
Pedagogy: Classroom lectures, tutorials, Group discussion, Seminar, Case studies& field work etc.,		
Course Outcomes: On successful completion of the course,the students will be able to a) Set up a Python environment, Apply Python syntax rules and structure to write basic programs. b) Recognize the significance of Python libraries like NumPy and Pandas in data analytics. c) Interpret visualizations to draw meaningful insights from data. d) Apply basic statistical techniques to summarize and analyze data. e) Prepare data, perform feature selection, and build multiple linear regression models.		
SYLLABUS:		HOURS
Module- 1: Introduction to Python.		12
Introduction to Python: Overview of Python: history, features, and applications. Setting up the Python environment. Python Basics: Python syntax and structure: statements, comments, indentation. Using Python as a calculator: arithmetic operations, variables, and data types. Data Types and Variables: Understanding data types: integers, floats, strings, Booleans. Declaring and using variables in Python. Type conversion and basic operations.		
Module-2: Python for Data Analytics		12
Introduction to Python libraries for data analytics (NumPy, Pandas). Loading and manipulating data using Pandas Data Frames. Basic data analysis operations: filtering, sorting, aggregating. Data Importing and Cleaning: Reading data from various sources: CSV, Excel, and databases. Data cleaning techniques: handling missing values, duplicates, and outliers.		
Module. 3: Exploratory Data Analysis (EDA)		12
Introduction to EDA and its importance in data analysis. Visualising data distributions, relationships, and patterns. Using Pandas and Matplotlib/Seaborn for EDA. (Practical sessions to be conducted using Real-time examples)		
Module.4: Basic Statistical Techniques		12
Measures of central tendency: mean, median, mode. Measures of dispersion: range, variance, standard deviation. Correlation and covariance. Linear Regression (Practical sessions to be conducted using Real time examples).		
Module.5: Multiple Linear Regression		08
Introduction to Multiple Linear Regression, Moving from SLR to MLR, Recognizing Multicollinearity problems, Reading and understanding the data, Data Preparation, Building Model, Residual Analysis and Prediction, Variable Selection using Recursive Feature Elimination (Practical sessions to be conducted using Real time examples)		

Skill Development Activities:

Apply Python programming and data analysis skills to analyze a dataset predict the model using Multiple Linear Regression. The steps you should follow are as follows.

(Practical record book to be used)

- 1.Data Preparation
2. Data Exploration and Cleaning
- 3.Exploratory Data Analysis
- 4.Descriptive Statistics
- 5.Multiple Linear Regression
- 6.Model Evaluation and Prediction

Books for Reference:

- Gowrishankar S and Veena A - Introduction to Python Programming – CRC Press
- Paul Barry- ‘Head-First Python’ – 2nd edition
- Zed A. Shaw - ‘Learn Python the Hard Way’ – 3rd edition
- Dr. R. Nageswara Rao – ‘Core Python Programming’ 2nd (Kindle Edition)(2018), Dreamtech Press.
- U. Dinesh Kumar Manaranjan Pradhan – ‘ Machine Learning using Python’ (2019), - Wiley
- Yashavant Kanetkar, Adithya Kanetkar ‘Let Us Python’ (2019) – BPB Publication
- Allen Downey & Jeffrey Elkner – ‘Learning with Python’ (2015) – Dreamtech Press
- Luca Massaron John Paul Mueller – ‘Python for Data Science’ (2019) – Dummies

Name of the Program: Bachelor of Commerce (Data Analytics) Course Code: B.Com. BDA.6.6 (Vocational Course) Name of the Course: Data Analysis using Tableau		
Course Credits	No. of Hours per Week	Total No. of Teaching Hours
4 Credits	4 Hrs.	56Hrs.
Pedagogy: Classroom lectures, Case studies, Tutorial classes, Group discussions, Seminar & fieldwork etc.,		
Course Outcomes: On successful completion of the course, the students will be able to a) Understand the foundational principles of data visualization. b) Utilize Tableau's features to connect to various data sources and build visualizations. c) Construct meaningful dashboards tailored to specific business needs. d) Implement advanced visualization techniques, calculations, and parameters to extract deeper insights. e) Share, publish, and apply Tableau skills in real-world data analytics scenarios relevant to commerce.		
Syllabus:		Hours
Module No. 1: Introduction to Data Visualization and Tableau		8
Understanding Data Visualization- Importance and principles of data visualization-Types of visual representations (charts, graphs, dashboards, etc.)- Role of data visualization in data analytics. Introduction to Tableau- History and importance of Tableau in the industry, Tableau Desktop, Tableau Server, and Tableau Public: A brief overview, Installing and setting up Tableau Desktop.		
Module No. 2: Getting Started with Tableau		12
Tableau Interface - Overview of the Tableau Desktop interface- Connecting to data sources: spreadsheets, databases, and web data connectors. Basic Visualization Techniques-Drag-and-drop features-Creating basic charts: bar, line, pie, scatter plots, and histograms-Dashboard and story creation basics.		
Module No. 3: Deep Dive into Data Visualization with Tableau		8
Advanced Visualization Techniques- Maps and geographical data representation - Heat maps, tree maps, and bubble charts- Dual-axis and combined charts. Working with Filters, Sorting, and Groups - Using filters for insights-Sorting data for better analysis-Creating and using groups and sets.		
Module No. 4: Calculations, Parameters, and Advanced Dashboard Design		14
Calculated Fields and Parameters- Creating calculated fields- Aggregations and calculations for deeper insights-Introduction to parameters and their applications. Advanced Dashboard Design-Best practices for dashboard design-Incorporating interactivity: actions, filters, and highlighting-Tooltips, visual grouping, and formatting for better visualization.		
Module No. 5: Sharing, Publishing, and Real-World Applications		14
Publishing and Sharing in Tableau-Introduction to Tableau Server and Tableau Public-Sharing dashboards and reports-Best practices for sharing sensitive data. Real-World Applications and Case Studies-Using Tableau in e-commerce- Financial data visualization using Tableau-Analyzing customer feedback and market research data.		

Skill Development activities:

1. Write the Role of data visualization in analytics
2. Write the different types of charts available in Tableau
3. Write the steps for performing filter and sorting using tableau
4. Write the steps in performing dashboard using tableau
5. Steps in analysing customer feedback and market research data.

Books for Reference:

- "Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software" by Daniel G. Murray
- "Tableau 10 Business Intelligence Cookbook" by Donabel Santos
- Tableau Official Documentation and Tutorials