Curriculum for Undergraduate Degree (B. Voc.) in Software Development (w.e.f. AY: 2022-23)

Part III: Detailed Curriculum

Second Semester (First Year)

Course Name:	**Introduction to Accounting**		
Course Code:	BSD201		
Semester:	II	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	This course introduces you to the basic accounting concepts and framework. It also covers the preparation of accounts of non-trading and those from incomplete records. After studying this course, you should be able to: • Understand the whole process of accounting • Work out the net result of business operations by preparing cashbook and BRS. • Work out the net result of business operations by preparing final accounts for both trading and non-trading concerns • Describe different methods of providing depreciation.

Course Contents:

Module No.	Description of Topic	Contact Hrs.
1	Basic Concepts of Accounting, Concept and Convention of Accounting, Accounting Principles, Accounting Cycle, Rules of debit and credit.	4L
2	Journal and Ledgers, Cash Book and Bank Reconciliation, Trial Balance.	4L
3	Concepts Relating to Final Accounts: Trading account; Profit and Loss Account; Balance Sheet; Adjustment entries.	10L
4	Rectification of errors: Rectification of one sided and double sided errors with the effects of suspense account. Effects on profit.	5L
5	Non-Profit Organizations and Incomplete Records. Receipt and Payment Account and Income and Expenditure Account.	5L
6	Depreciation – Causes – Methods of Calculating Depreciation – Straight Line Method, Diminishing Balance Method, and Annuity Method. Conversion method.	8L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Demonstrate an understanding of the principles of accrual accounting.
2	Interpret and analyze financial statements to aid in decision making.
3	Use the accounting cycle to develop financial statements from business transactions.
4	Describe the purpose of accounting and explain its role in business and society.

Learning Resources:	
1	P. C. Tulsian: Financial Accounting, Pearson
2	M. Hanif, A. Mukherjee: Financial Accounting, TMH
3	Basu & Das : Financial Accounting, Rabindra Library
4	Ashoke Banerjee: Financial Accounting, Excel Books

Course Name:	**Data and File Structure**		
Course Code:	BSD202		
Semester:	II	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	C Programming concepts
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	To familiarize with the basic concepts of linear and non linear data structures and its operations
2	To acquaint with file structure and its application areas

Course Contents:

Module No.	Description of Topic	Contact Hrs.
1	**Introduction:** Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc. Time Complexity and Space Complexity – Introduction to Order functions – Examples of Analysis	2L
2	**Stacks and Queues:** Stack and its operations and related algorithms, Applications of Stacks: Expression Conversion and Evaluation with example Queue: Types of Queue: Linear Queue: its operations and related algorithms. Introduction to Circular Queue	8L
3	**Searching:** Linear Search and Binary Search algorithms	4L
4	**Sorting:** Objective and properties of different sorting algorithms: Bubble Sort, Selection Sort, Insertion Sort	6L
5	**Singly Linked Lists:** Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list	6L
6	**Trees:** Basic Tree Terminologies, Binary Tree: its properties and traversal algorithms	4L
7	**File Structure:** Terminology, File Organization, Sequential Files: Structure, Operations and Areas of use. Direct File Organization and Indexed Sequential File Organization: overview and application	6L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Understand the basic concepts of Data structures and complexity of algorithms.
2	Comprehend the concepts of linear and nonlinear data structures and operations on them.

3	Apply the knowledge of linear and nonlinear data structures in solving problems.
4	Familiar with the concept of Sequential, Direct and Index Sequential File Organization.

Learning Resources:	
1	"Data Structures with C" by Seymour Lipschutz, McGrawHill
2	"Data Structures Using C" by Reema Thareja, Oxford
3	"Fundamentals of Data Structures of C" by Ellis Horowitz, Sartaj Sahni
4	"Data Structures using C" by A N Tenenbaum, Y Langsam, M J Augenstein, Pearson

Course Name:	**Software Engineering**		
Course Code:	BSD203		
Semester:	II	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	Student will learn about the Software Requirement Analysis.
2	Student will know how to develop software by writing code.
3	Student will get the idea of software testing, deployment and maintenance.

Course Contents:

Module No.	Description of Topic	Contact Hrs.
1	**Introduction to Software Engineering:** Definition, Software characteristics, Software components, Software crisis, Software Applications, Software Engineering Paradigms, Software Development Life Cycle (different models of software development).	8L
2	**Software Project Management:** Introduction, Project planning, metrics for project size estimation, project estimation techniques, Cost estimation, COCOMO model, Project scheduling and milestones	6L
3	**Software Requirement Specification (SRS):** Definition, Problem analysis, structuring information, Data flow diagram and data dictionary, structured analysis, Characteristics and component of (SRS), Metrics of SRS.	8L
4	**Software Design and coding:** Introduction, classification of design activities and design Methodologies, Cohesion and Coupling, Verification and validation, approaches to software design, introduction to various design approaches, Top-down and Bottom-up programming, Structured programming, Coding standards and guidelines.	6L
5	**Software Testing and Maintenance:** Software Testing, levels of testing, Test case design, Design metrics, Coding metrics, Technical metrics, testing metrics. Types of Software maintenance.	5L
6	**Trends in Software Engineering:** Reverse Engineering, Re–engineering, CASE Tools	3L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Design and develop a software after necessary requirement analysis.

2	Test software for deployment and maintain software with customer satisfaction.

Learning Resources:	
1	Pressman: Software Engineering: A Practitioner's Approach, Macgrohill International.
2	An Integrated Approach to Software Engineering, Second Edition, Pankaj Jalote.
3	Fundamentals of Software Engineering, Rajib Mall.

Course Name:	**Data Visualization**		
Course Code:	BSD204		
Semester:	II	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	Statistics, Algorithm concept
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	Understand the basic concepts of data and its representation.
2	Learn the effectiveness of data visualization.
3	Learn different data visualization techniques.

Course Contents:

Module No.	Description of Topic	Contact Hrs.
1	Introduction: Basic concept about different types of data. Interpretation of data and data representation. Introduction of data visualization	8L
2	Basic Plotting: Scatter plot, Line plot. Different statistical plot: Bar chart, Stacked Bar chart, Pie chart, Histogram, Polygon, Sub plots.	10L
3	Applied Visualization: Box plot – Density plot Area chart – Heat map – Tree map – Graph networks.	8L
4	Visual perception and Cognition, Application of principles of Information visualization. Use of software tool (MS Excel) to learn different techniques for data visualization	10L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Produce basic data visualizations using a chosen dataset.
2	Evaluate how effectively a visualization conveys target data
3	Use the respective software tool (MS Excel) to present data with relevant graph.

Learning Resources:	
1	Data Visualization using Power BI, Orange and Excel, Dr. Shirshendu Roy.
2	Data Analysis with Excel, Nigam Manisha, BPB.
3	Data Visualization: Exploring and Explaining with Data, Jeffrey D. Camm/James J Cochran/Michael J. Fry/Jeffrey W. Ohlmann

Course Name:	**Accounting Lab**		
Course Code:	BSD291		
Semester:	II	**Credit:**	1.5
L-T-P:	0-0-3	**Pre-Requisites:**	
Full Marks:	50		
Examination Scheme:	Semester Examination: 30	Continuous Assessment:20	

Course Objectives:	
1	This course is designed to impart knowledge regarding concepts of Financial Accounting Tally is an accounting package which is used for learning to maintain accounts.
2	To recognize commonly used financial statements, their components and how information from business transactions flows into these statements
3	To demonstrate progressive learning of various tax issues and tax forms related to individuals.
4	To demonstrate knowledge in setting up a computerized set of accounting books for a "for profit "entity.

Course Contents:

Module No.	Description of Topic	Contact Hrs.
1	Introduction of Tally System, Basic Concepts of Accounting, Company Creation. Ledger & Group Creation	3P
2	Creation, Alteration, Displaying. And Deletion of Voucher Entries also Various Features of Function Key. Payment, Receipt, Journal. Contra, Purchase, Sales Concept of Day Book, B/S, Ratio)Etc.	6P
3	Creation, Alteration, Displaying. Of Stock, Cost center, Purchase and Sales Maintain Bill By Bill, Debit note/Credit Note, Stock Summary Report. Purchase & sale Order, Receipt/Delivery Note, Final Purchase & sales, Return Goods Entry.	6P
4	Various Method of Tax Deduction and GST. Implementation of GST	6P
5	Create Manufacturing voucher type. Process order through Manufacturing Voucher	6P
6	Price Level, Price List, Optional Vouchers, Memo Journal	3P
7	Maintain Payroll Management	6P
Total		**36P**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Demonstrate the accounting transactions in computerized format and find the financial result concern.
2	Acquire the skill of financial decision making in a systemized manner.

3	Interpret the financial statements as well as evaluation of stock at the end
4	Acquire the skill of Tax Calculation

Learning Resources:	
1	Dr Vishal Saxena, Principles & Practices of Accounting Book for CA Foundation,Bharat
2	Dr P C Tulsian ,Financial Accounting Book
3	Dr. S.k. Singh, Dr. Jitendra Kumar Saxena: Practical Problems In Financial Accounting, sbpdpublications
4	Rupesh Agrawal. Financial Accounting for CMA Inter . Taxmann.

Course Name:	**Data and File Structure Lab**		
Course Code:	BSD292		
Semester:	II	**Credit:**	1.5
L-T-P:	0-0-3	**Pre-Requisites:**	C Programming concepts
Full Marks:	50		
Examination Scheme:	Semester Examination: 30	Continuous Assessment: 20	

Course Objectives:	
1	To familiarize with programming concepts required for implementing linear data structures and its operations.
2	To acquaint with dynamic memory allocation concepts required for implementing Single Linked List.
3	To develop the ability to write menu driven programs to implement various operations of Linear Data Structures and different sorting and searching techniques.

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	**Array, Stack and Queue:** a. Basic data structure operations using Array b. Implementation of Stack operations using array c. Implementation of Linear Queue operations using array d. Implementation of Circular Queue operations using array	12P
2	**Single Linked List:** Implementation of Single Linked List and associated operations (menu driven)	9P
3	**Searching and Sorting:** Implementation of various Searching algorithms (Menu driven) Implementation of various Sorting algorithms (Menu driven)	15P
Total		**36**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Demonstrate and Implement basic data structure operations using Array
2	Demonstrate and Implement basic operations of Stack, Linear and Circular Queue
3	Develop program on Single Linked List and its operations
4	Design and Implement menu driven programs on Searching and Sorting algorithms

Learning Resources:	
1	"Data Structures with C" by Seymour Lipschutz, McGrawHill

2	"Data Structures Using C" by Reema Thareja, Oxford
3	"Fundamentals of Data Structures of C" by Ellis Horowitz, Sartaj Sahni
4	"Data Structures using C" by A N Tenenbaum, Y Langsam, M J Augenstein, Pearson

Course Name:	**On Job Training**		
Course Code:	OJT281		
Semester:	II	**Credit:**	15
L-T-P:	Sessional	**Pre-Requisites:**	
Full Marks:	200		
Examination Scheme:	Training in Semester: 200		

Training Scheme:
Students will go for an industrial training in the semester end for one month. After completion of the training, they will prepare a report and provide a presentation on the training in front of faculty members. On the basis of their report and presentation they will be evaluated.