Semester - 2

Course Code: 201

Course Title: Ability Enhancement Course-02

Course Code	201
Course Title	Ability Enhancement Course – 02 [Title of the course will be the one selected by the student from courses offered by college/institute out of the course basket offered by the University under the Ability Enhancement courses
Credits	2
Course Category	Ability Enhancement Course (AEC-02)
Level of Course	100-199 (Foundation / Introductory)
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2022-2023
Implementation Year:	A.Y. 2023-2024
Purpose of Course	To be offered to students to achieve competency in a Modern Indian Language and English Language focused on language and communication skills. This will be an elective course. Can be selected from the list of elective options available under the basket of Ability Enhancement certificate Courses offered by the University.
Course Objective	The course aim at enabling the students to acquire and demonstrate the core linguistic skills, including critical reading and expository and academic writing skills that help students articulate their arguments and present their thinking clearly and coherently and recognize the importance of language as a mediator of knowledge and identity. They would also enable students to acquaint themselves with the cultural and intellectual heritage of the chosen MIL and English language, as well as to provide a reflective understanding of the structure and complexity of the language/literature related to both the MIL and English language. The courses will also emphasize the development and enhancement of skills such as communication, and the ability to participate/conduct discussion and debate.
Pre-requisite	Knowledge of English at H.Sc.(12^{th}) Level
Course Outcomes	The list of Electives are showing individual course's Course Outcomes.
Mapping between Course Outcomes(CO) with Program Specific Outcomes(PSO)	The list of Ability Enhancement Elective courses are showing mapping between Course Outcomes(CO) with Program Specific Outcomes (PSO) for individual courses.
Course Content	As per the selected course from the basket of offered courses by the University.
Reference Books	- The list of reference books will be decided by the Institutes/Colleges/Departments or as per the university guidelines based on the selected Course. - Minimum five copies of five different titles relevant topics are recommended to keep in the library. Electives are showing individual course's reference books.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course Code: 202-01
Course Title: Computerized Financial Accounting

Course Code	202-01
Course Title	Computerized Financial Accounting [This is multi-disciplinary/inter-disciplinary category of course. Student can select any course from the basket of courses offered by the institute/college offered by the University under the Multi-Disciplinary courses or Inter-disciplinary courses basket.]
Credit	4
Course Category	Multi Disciplinary Course – 02
Level of Course	100-199 (Foundation / Introductory)
Teaching Per Week	4 Hours
Review/Revision	2022-2023
Implementation Year	A.Y.2023-24
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)
Purpose of Course	- To impart knowledge about accounting and how the accounts can be maintained using computer software. - This will give an idea to understand the Financial accounting terminologies and the model which is computerized. - [This is constituent discipline of the major courses and it helps learners to acquire core competence in relevant or any other independent courses of their choices. This course may be major specific or other discipline specific. Learner shall have option to choose the course from available pool of courses or from any other institutions as the learner's choice. - Interdisciplinary course can help to gain the skills needed to adapt to a rapidly changing workplace, combining theory with practice to help students develop valuable transferable skills. - Multi-disciplinary course allows the students to understand the power of new ideas. It helps them to develop a pragmatic attitude by allowing them to decide what subjects they will opt for and what could be their possible benefits. They get time to make a decision by calculating the risks & advantages. - Student can opt any one course of multi-disciplinary nature from other than the computer Science and Application faculty. The course will be offered by the institute/college passed by the Board of Studies of University faculties other than the computer science and application faculty.]
Course Objective	The course will give fundamental ideas about the accounting software and as a course study, the students can understand how the accounting software works. It also give an idea about various terminologies related to the computerized financial accounting. - Integration of Knowledge and Skills: One objective of a multidisciplinary course is to foster the integration of knowledge and skills from different disciplines. By combining various areas of study, students can gain a holistic understanding of a particular topic or problem. This objective aims to break down the traditional boundaries between subjects and encourage students to see connections and relationships across different fields. - Promoting Critical Thinking and Problem Solving: Another objective is to enhance students' critical thinking and problem-solving abilities. Multidisciplinary courses often involve complex real-world issues that require a multifaceted approach. By engaging with diverse perspectives and methodologies, students develop the capacity to analyze problems

from multiple angles, think creatively, and propose innovative solutions.

- Enhancing Collaboration and Communication Skills: Collaboration and effective communication are essential skills in today's interconnected world. Multidisciplinary courses aim to cultivate these skills by providing opportunities for students to work collaboratively with peers from different disciplines. Through group projects, discussions, and presentations, students learn how to articulate their ideas, listen actively to others, and collaborate effectively to achieve common goals. This objective prepares students for interdisciplinary work environments and encourages the exchange of ideas across disciplinary boundaries.

Course Outcome

CO1- After learning this subject student will be able to know the basic concepts of Financial Accounting & use of a good Financial Accounting Software
CO2- student will able to learn basic about financial accounting and its concepts
CO3- students will able to learn about transaction and types of accounts
CO4- student will able to learn the book-keeping concept
CO5- student will able to know about the journal and other related details
CO6- student will learn about the ledger and trail balance

Mapping Between Cos with PSOs

	PS01	PS02	PS03	PS04	PS05	PS06	PS07	PS08
CO1								
CO2								
CO3								
CO4								
CO5								
CO6								

Course Content

Unit 1: Introduction to Accounting System
1.1 Meaning & Definition of Accounting
1.2 Objectives of Accounting
1.3 Concepts and Features of Book Keeping
1.4 Branches of Accounting (Financial Management, Cust)
1.5 Basis of Accounting (Accrual Bases, Cash Bases)
1.6 Accounting Concepts

Unit 2: Accounting Equation & Transaction Analysis
2.1 Introduction to Assets, Liabilities, Equities
2.2 Concepts of Transaction Analysis
2.3 Classification of Accounts (Real Account, Personal Account, Nominal Account)

Unit 3: Concepts of Book-Keeping
3.1 Introduction of Single Entry System and advantages/disadvantages
3.2 Introduction of Double Entry System and its advantages
3.3 Types of Business Transaction
3.4 Concepts of important Terminologies : Opening Stock, Closing Stock, Goods, Inventory, Assets, Liabilities, Capital, Debit, Debtors, Creditors, Income, Expenses, Loss, Profit, Credit, Debit.

Unit 4: Journal & Subsidiary Books (With Preliminary examples)
4.1 Meaning of Journal

	4.2 Format of Journal 4.3 Concept of format of cash Book 4.4 Concept and format of Petty cash Book 4.5 Concept of format of Purchase Sale, Purchase Return and Sale Return Book **Unit 5: Concepts of Accounting Mechanism** 5.1 Meaning and Definition of Ledger 5.2 Types of Ledger 5.3 Trial Balance and its objectives
Reference Books	1. Accounting for Management – By Dr. Jawaharlal 2. Financial Management – By Dr. S. N. Maheshwari 3. Accounting for Management – By S. K. Bhattacharya & John Dearden 4. Advanced Accountancy – By S. P. Jain & K. I. Narang 5. Implementing Tally 6.3 – By K. K. Nathani – BPB Publication 6. Implementing Tally 7.2 – By A. K. Nathani & K. K. Nathani BPB Publication
Teaching Methodology	Classwork, Discussion, Self Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course Code: 202-02
Course Title: Organizational Structure and Behaviour

Course Code	202-02
Course Title	Organization Structure & Behaviour (Multidisciplinary Course) [This is multi-disciplinary/inter-disciplinary category of course. Student can select any course from the basket of courses offered by the institute/college offered by the University under the Multi-Disciplinary courses or Inter-disciplinary courses basket.]
Credit	4
Course Category	Multidisciplinary Course (MC-02)
Level of Course	100-199 (Foundation / Introductory)
Teaching Per Week	4 Hours
Review/Revision	2022-2023
Implementation Year	A.Y. 2023-2024
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)
Purpose of Course	- Computer Science professionals work at different levels in the hierarchy of various jobs in IT. It is essential to understand the Organization Structure and behavior. - Integration of Knowledge and Skills: One objective of a multidisciplinary course is to foster the integration of knowledge and skills from different disciplines. By combining various areas of study, students can gain a holistic understanding of a particular topic or problem. This objective aims to break down the traditional boundaries between subjects and encourage students to see connections and relationships across different fields. - Promoting Critical Thinking and Problem Solving: Another objective is to enhance students' critical thinking and problem-solving abilities. Multidisciplinary courses often involve complex real-world issues that require a multifaceted approach. By engaging with diverse perspectives and methodologies, students develop the capacity to analyze problems from multiple angles, think creatively, and propose innovative solutions. - Enhancing Collaboration and Communication Skills: Collaboration and effective communication are essential skills in today's interconnected world. Multidisciplinary courses aim to cultivate these skills by providing opportunities for students to work collaboratively with peers from different disciplines. Through group projects, discussions, and presentations, students learn how to articulate their ideas, listen actively to others, and collaborate effectively to achieve common goals. This objective prepares students for interdisciplinary work environments and encourages the exchange of ideas across disciplinary boundaries.
Course Objective	The objective of this course is to make students aware about the Structure of an Organization and provide them concepts that leads to better understanding of human behavior in an organization.
Course Outcome	CO1- After completion of the course the student will be aware about the Structure of an organization CO2- Also, will have better understanding of human behaviour in an organization CO3- Students will understand and develop their attitude CO4- Students will learn the importance of motivation

	CO5- Students will be able to understand the leader, skills of leader and leadership styles CO6- students will have idea about BPO and call centers
Mapping Between Cos with PSOs	<table><tr><th></th><th>PS01</th><th>PS02</th><th>PS03</th><th>PS04</th><th>PS05</th><th>PS06</th><th>PS07</th><th>PS08</th></tr><tr><td>CO1</td><td>■</td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO2</td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO3</td><td></td><td></td><td></td><td></td><td>■</td><td></td><td></td><td></td></tr><tr><td>CO4</td><td>■</td><td></td><td>■</td><td>■</td><td></td><td></td><td></td><td>■</td></tr><tr><td>CO5</td><td>■</td><td></td><td>■</td><td>■</td><td>■</td><td>■</td><td></td><td></td></tr><tr><td>CO6</td><td></td><td>■</td><td></td><td>■</td><td></td><td>■</td><td></td><td>■</td></tr></table>
Course Content	**Unit 1: Introduction to Organization and Management** 1.1 What makes an organization 1.2 Structure of organization 1.3 What is Management 1.4 Scope of Management 1.5 Role of Management 1.6 Manager's Role (Interpersonal Role, Information Role and Decisional Role) 1.7 Managerial Skills (Technical Skills, Human Skills, Conceptual Skills) **Unit 2: Attitude** 2.1 Meaning of Attitude 2.2 Characteristic of Attitude **Unit 3: Motivation** 3.1 What is motivation? 3.2 Nature and Characteristics of Motivation 3.3 Importance & Benefits of Motivation **Unit 4: Leadership** 4.1 What is Leadership? 4.2 Characteristics of Leadership 4.3 Leadership Styles 4.4 Leadership Skills (Technical Skills, Conceptual Skills, Personal Skills) **Unit 5: BPO and Call Centre** 5.1 What is B.P.O? 5.2 What is out-sourcing? Benefits of outsourcing 5.3 What is Call Centre? 5.4 Call Centre setup & functions
Reference Books	1. Management & Organization Development – By Ahmed Abod Rachana Prakashan, New Delhi 2. Organization Behaviour – By Applewhite Philip, Prentice hall 3. Management & Organization Development – By Argyris Chris McGraw Hill 4. Human Behaviour at work – By Devis Keith, Tata MacGraw Hill 5. Organization Behaviour – By L. M. Prasad 6. Principles and Practices of Management – By L. M. Prasad 7. Managing People at work – By Harris O Jeff, John Wiley & Sons Publication 8. Call Centres – By S. Pankaj (APII Publication)
Teaching Methodology	Classwork, Discussion, Self Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course Code: 203
Course Title: Operating System

Course Code	203
Course Title	Operating System
Credits	4
Course Category	Minor Course
Level of Course	100-199 (Foundation / Introductory)
Teaching per Week	4 Hours
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2022-2023
Implementation Year:	A.Y. 2023-2024
Purpose of Course	An Operating System (OS) is a software that manages computer hardware and software resources and provides common services for computer programs. The operating system is an essential component of the system software in a computer system. Application programs usually require an operating system to function. The course is based on open source operating systems like Linux.
Course Objective	1. To understand functionality provided by an Operating System. 2. To make aware with basic concepts of Windows O. S. Management. 3. To learn about device management.
Pre-requisite	Basic knowledge of computers.
Course Outcomes	**CO1:** Students will learn how operating system is important for computer system and what is the role of an OS, and also learn different types of operating system and their services. **CO2:** Students will be able to understand the structure and organization of file system. **CO3:** To differentiate between windows and linux OS **CO4:** To install and maintain linux workstation and also able to manage user accounts. **CO5:** To understand devices, usage of devices, scheduling algorithms and decide which is the best one. **CO6:** Students will be able to develop application the coordinate with respective OS in a much better way which is an essential.
Mapping between Course Outcomes(CO) with Program Outcomes(PSO)	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CO1	■	■	■	■				
CO2	■	■	■	■	■			
CO3				■	■	■		
CO4				■	■	■	■	
CO5	■	■		■	■	■	■	■
CO6					■	■	■	■

Course Content	**Unit 1. Operating System Concepts** 1.1.Evolution of Operating System & History 1.2.Need of an Operating System 1.3.Single User & Multi User Operating System 1.3.1 Types of OS and their advantages and dis-advantages 1.3.2 Batch OS, Distributed OS, Multi-Tasking OS 1.3.3 Rea-time OS, Mobile OS 1.4.Elements of an Operating System

	1.5.Operating System as a Resource Manager **Unit 2. Introduction to File System and File Management** 2.1. File Concept 2.2. Operations on File 2.3. File Access Methods (Sequential Access and Direct Access) 2.4. Directory Systems File Management Functions. 2.5. File System and Directory Structure organization. 2.6. File Protection. **Unit 3. Introduction of Linux** 3.1.Introduction of Linux versions 3.2.Components of Linux 3.3.Comparison of Windows and Linux **Unit 4. Linux Administration** 4.1. Installing Linux 4.2. Installation of Open Source Software 4.3.Maintaining User Accounts 4.4.System Config Services (Package) **Unit 5. Device Management** 5.1.Device Management Function 5.2.Device Characteristics 5.3.Disk space Management 5.4.Allocation and Disk Scheduling Methods
Reference Books	1. Operating System Concepts: – James Peterson: – McGraw Hill 2. Operating System: – Stallings - PHI 3. Operating System Principles: – Silberschatz, Galvin, Gagne - Willey, India 4. Operating Systems – A. S. Godbole – Tata McGraw Hill 5. Linux – The Complete Reference – Richard Petersen – Tata McGraw Hill 6. "Operating System Concepts" Author: Abraham Silberschatz, Greg Gagne, Peter B. Galvin ISBN: 978-1118063330 Publisher: Wiley 7. "Linux System Programming: Talking Directly to the Kernel and C Library" Author: Robert Love ISBN: 978-1449339531 Publisher: O'Reilly Media 8. "Linux Bible" Author: Christopher Negus ISBN: 978-1118999875 Publisher: Wiley 9. "Understanding the Linux Kernel" Author: Daniel P. Bovet, Marco Cesati ISBN: 978-0596005658 Publisher: O'Reilly Media 10. "Linux Command Line and Shell Scripting Bible" Author: Richard Blum ISBN: 978-1118983843 Publisher: Wiley
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course Code: 204
Course Title: Programming Skills

<table>
<tr><td>Course Code</td><td>204</td></tr>
<tr><td>Course Title</td><td>Programming Skills</td></tr>
<tr><td>Credits</td><td>4</td></tr>
<tr><td>Course Category</td><td>Major Course</td></tr>
<tr><td>Level of Course</td><td>200-299 (Intermediate Level)</td></tr>
<tr><td>Teaching per Week</td><td>4 Hours (2 Hours Theory + 4 Hours Practical)</td></tr>
<tr><td>Minimum weeks per Semester</td><td>15 (Including class work, examination, preparation etc.)</td></tr>
<tr><td>Review / Revision</td><td>2022-2023</td></tr>
<tr><td>Implementation Year:</td><td>A.Y. 2023-2024</td></tr>
<tr><td>Purpose of Course</td><td>To understand concepts of programming using Compiler based programming language C and Interpreter based programming Language Python. To compare the code structures of Compiler based programming language ‘C’ and interpreter based programming language ‘Python’.
[Python codes can be executed using any open source IDE. This is not IDE specific course.]</td></tr>
<tr><td>Course Objective</td><td>i) Advance programming skills using compiler based programming language C.
ii) Introduction of Interpreter based Programming language Python.
iii) Enhancing basic programming skills using Interpreter based and Compiler based programming languages</td></tr>
<tr><td>Pre-requisite</td><td>Fundamental knowledge of computer programming using ‘C’ language.
Knowledge of Python IDE installation is recommended.</td></tr>
<tr><td>Course Outcomes</td><td>CO1: Students will be able to learn advanced programming concept of compiler based programming language.
CO2: Students will be proficient working on conditional statements, iterative Statements and fundamentals of programming concepts using C and Python.
CO3: Students will be able to represent compound data using lists, tuples and dictionaries in Python programs.
CO4: Students will be able to develop real world application.
CO5: Students will learn important libraries like Numpy, Pandas which are useful in Data analysis, Machine Learning.</td></tr>
<tr><td>Mapping between Course Outcomes(CO) with Program Specific Outcomes(PSO)</td><td>
<table>
<tr><th></th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th><th>PSO6</th><th>PSO7</th><th>PSO8</th></tr>
<tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td>CO5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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</td></tr>
<tr><td>Course Outcome</td><td>- On completion of the course, the Students will be conceptually clear about the two dimensional arrays, structures and unions using ‘C’ programming language.
- Concept of conditional statements, iterative Statements and fundamentals of programming concepts using Python.</td></tr>
<tr><td>Course Content</td><td>UNIT-1: Arrays, Structure & Union and User defined function in C programming Language
1.1 Concepts of Two-Dimensional Numeric Array
1.1.1 Declaring Two-Dimensional numeric array
1.1.2 Two-Dimensional numeric Array operations (Addition, Subtraction, Multiplication, Transpose)
1.1.3 Element Address in array(Row major and Column major)</td></tr>
</table>

	1.1.4 Two-Dimensional Character Array: 1.1.4.1 Declaring& Initializing Two-Dimensional character array 1.1.4.2 Two-Dimensional character Array operations (Searching elements, copying, merging, finding length of given string) 1.2 Concepts of structure and Union 1.2.1 Defining, declaring and Initializing structure and Union 1.2.2 Typedef and accessing structure member 1.2.3 Difference between structure and union 1.3 User defined functions 1.3.1 Function return type, parameter list, local function variables 1.3.2 Passing arguments to function 1.3.3 Calling function from main() function or from other function. 1.3.4 Function with No arguments and no return value, No arguments and are turn value, with arguments and no return value, with arguments and are turn value. 1.3.5 Recursive Function **UNIT-2: Python Fundamentals** 2.1 Concepts of Interpreter based programming language 2.1.1 Structure of Python Programming language. 2.1.2 Python code Indention and execution 2.2 Python Variables 2.2.1 Naming of variables and Dynamic declaration of variables 2.2.2 Comments in Python 2.2.3 Assigning values to multiple variables 2.2.4 Global variables 2.3 Python Data types 2.3.1 Text(str), Numeric Type(int, float, complex),Boolean(bool) 2.3.2 Setting Data types 2.3.3 Type conversion(int, float, complex),casting(int, float, str) 2.4 User defined function. 2.4.1 Defining function, Function with Parameters 2.4.2 Parameter with default value, Function with return value **UNIT-3: Python Strings and Operators** 3.1 Python Strings 3.1.1 Multiline string, String as character array, triple quotes 3.1.2 Slicing string, negative indexing, string length, concatenation 3.1.3 String Methods: (centre, count, join, len, max, min, replace, lower, upper, replace, split) 3.2 Operators 3.2.1 Arithmetic Operators(+,-,*,/,%,**,//) 3.2.2 Assignment Operators(=,+=,-=,/=,*=,//=) 3.2.3 Comparison Operators (==,!=,>,<,>=,<=) 3.2.4 Logical Operators(and, or, not) 3.2.5 Identity and member operators(is, is not, in, not in) **UNIT-4: Python conditional and iterative statements** 4.1 If statement, if..elif statement, if..elif…else statements, nested if 4.2 Iterative statements

	4.2.1 While loop, nested while loop, break, continue statements. 4.2.2 for loop, range, break, continue, pass and Else with for loop, nested for loop. 4.3 List: creating list, indexing, accessing list members, range in list, List methods (append, clear, copy, count, index, insert, pop, remove, reverse, sort). **UNIT-5: Python Collections and Library** 5.1 Python Collections 5.1.1 Tuples: Declaring tuple, indexing tuple, changing tuple values, adding and removing data from tuple, Use of tuple() method to create tuple, count() and index() methods. 5.1.2 Sets: declaring set, access set data, set methods (add, clear, copy, discard, pop, remove, union, update). 5.1.3 Dictionary 5.1.3.1 Creating Dictionary, Adding, Accessing and Removing element 5.1.3.2 Dictionary methods: get(),pop(), popitem(),clear(),copy() 5.2 Introduction to Numpy and Pandas 5.2.1 Overview of numpy 5.2.1.1 Numpy methods (Mean, Median, Mode, Standard Deviation and Variance) 5.2.1.2 Implementation of Numpy methods on numeric data set created using list. 5.2.2 Pandas Dataframe 5.2.2.1 Creating dataframe using list 5.2.2.2 Creating dataframe using dict of equal length list 5.2.2.3 Reading data using csv file(read_csv()) 5.2.2.4 Retrieving rows and columns from data frame using index 5.2.2.5 Retrieving rows and columns using loc and iloc functions.
Reference Books	1.Programming in C, Balaguruswami - TMH 2. C Programming Language, Kernigham & Ritchie - TMH 3. The spirit of C, Cooper H & Mullish H - Jaico Pub. 4. Programming in C, Stephan Kochan - CBS 5. Mastering Turbo C, Kelly & Bootle - BPB 6. C Language Programming, Byron Gottfried –TMH 7. Learning Python -Mark Lutz : O'Reilly Media 8. Core Python Programming – by Wesley J Chun ISBN-13: 978- 0132269933 9. Python for Everybody: Exploring Data in Python 3, by Charles Severance (Author), Aimee Andrion (Illustrator), Elliott Hauser (Editor), Sue Blumenberg (Editor) 10. An Introduction to Python - by van Rossum Guido ISBN: 9780954161767, 0954161769 11. Core Pyhton Application Programming – by Wesley J Chun Prentice Hall
Teaching Methodology	Class Work, Discussion, Lab work, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course Code: 205
Course Title: Concepts of Relational Database Management System

Course Code	205
Course Title	Concepts of Relational Database Management System
Credits	4
Course Category	Major Course
Level of Course	200-299 (Intermediate Level)
Teaching per Week	4 Hours (2 Hours Theory + 4 Hours Practical)
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2022-2023
Implementation Year:	A.Y. 2023-2024
Purpose of Course	- Imparting fundamental knowledge of Relational Database. - This course also includes SQL & fundamentals of PL/SQL.
Course Objective	1. To make students understand about RDBMS architecture 2. Have edge over Control and Iterative statements of PL/SQL 3. Understanding advanced SQL and various complex queries. 4. To make students aware of cursors and Exception Handling.
Pre-requisite	Basic knowledge of Database Management.
Course Outcomes	**CO1** : Students will learn Fundamental Knowledge of Relational database model . **CO2** : Explain and demonstrate advance and various complex queries using SQL. **CO3** : Student will learn about concept of PL/SQL and concept of logic development in PL/SQL through conditional statement. **CO4** : To understand and impart knowledge in order to have edge over Control and iterative statement of PL/SQL in order to improve the applied concept using coding and implement of coding to solve PL/SQL problems. **CO5** : To explain student about cursors and exception handling and demonstrate the concept by implementing to solve the problems. **CO6** : To understand concepts of data storage , retrieval and administration of the data in Relational Models using SQL and PL/SQL.
Mapping between Course Outcomes(CO) with Program Specific Outcomes(PSO)	

	PSO 1	PSO2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8
CO1	■	■	■	■	■			
CO2	■	■		■	■			
CO3	■	■		■	■	■		
CO4	■	■		■	■	■		
CO5		■	■	■	■		■	
CO6		■	■		■		■	■

Course Content

Unit-1. Introduction of Relational model

1.1 Codd's Rules

1.2 Relational operations Algebra
(select, project, union, intersection, rename)

1.3 Transaction control language: commit, savepoint, rollback

1.4 Data Control language: Grant, Revoke

Unit-2 Advanced SQL

2.1 Data types (NUMBER, CHAR, VARCHAR, VARCHAR2, CLOB, NCLOB, LONG, DATE, RAW, LONGROW)

2.2 ROWID pseudo column & DUAL table

2.3 DATE Functions (SYSDATE, SYSTIMESTAMP, TO_CHAR, TRUNC, ROUND, NEXT_DAY, LAST_DAY, MONTHS_BETWEEN, ADD_MONTHS)

2.4 Concepts of Index (Create, drop)

	2.5 Join Queries 2.5.1 Inner Join 2.5.2 Outer Join (Left, Right, Full) 2.5.3 Cross Join 2.6 Sub Queries with(Insert, update and Delete) 2.7 Nested queries **Unit-3: PL/SQL and conditional Statements :** 3.1 Introduction to PL/SQL (Definition & Block Structure) 3.2 Variables, Constants and Data Type 3.3 Assigning Values to Variables 3.4 User Defined Record 3.5 Conditional Statements 3.5.1 IF…THEN statement 3.5.2 IF..Else statements 3.5.3 multiple conditions 3.5.4 Nested IF statements 3.5.5 CASE statements **Unit-4 : Iterative Statements :** 4.1 Iterative statements : 4.1.1 Loop..End Loop 4.1.2 For.. Loop 4.1.3 While Loop 4.1.4 EXIT Loop 4.1.5 Continue **Unit-5: Cursors and Exception Handling:** 5.1 Concepts of Cursors 5.1.1 Types of cursors (Implicit & Explicit) 5.1.2 Declare, open, fetch and close cursors. 5.2 Cursor Attributes : (%FOUND,%NOTFOUND,%ISOPEN,%ROWCOUNT) 5.3 Exception Handling in PL/SQL 5.3.1 Types of Exceptions: 5.3.1.1 Named System Exceptions 5.3.1.2 Unnamed System Exceptions 5.3.1.3 User-defined Exceptions 5.3.1.4 User Defined Exceptions 5.3.2 Exception Handling
Reference Books	1. The Complete Reference, George Koch, Kevin Loney – Oracle Press 2. Database Management System, Oracle, SQL and PL/SQL, 2nd ed., Das Gupta & Radha Krishna, PHI 3. Oracle 9 PL/SQL Programming, Scott Urman – Oracle Press 4. Oracle SQL: The Essential Reference, David C. Kreines – O'Reilly 5. SQL, PL/SQL :The Programming Language Of Oracle, Ivan Bayross – BPB 6. Oracle PL/SQL Programming – Feuerstein & Peribyl – SPD O'Reilly 7. Learning Oracle SQL and PL/SQL: A Simplified Guide, Rajeeb Chatterjee 8."Oracle PL/SQL Programming" Authors: Steven Feuerstein, Bill Pribyl ISBN: 978-0596009779 Publisher: O'Reilly Media 9."Oracle SQL Developer Handbook" Authors: Dan Hotka, Sue Harper ISBN: 978-0071484742 Publisher: McGraw-Hill Education 10."Oracle Database 12c PL/SQL Programming" Authors: Michael McLaughlin, John Harper ISBN: 978-0071812436 Publisher: McGraw-Hill Education
Teaching Methodology	Class Work, Discussion, Lab work, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course code: 206
Course Title: Skill Enhancement Course (SEC-02)

Course Code	206
Course Title	Skill Enhancement Course - II (SEC – 02)
Credit	2
Category of Course	Skill Enhancement Course
Level of Course	100-199 (Foundation / Introductory)
Teaching per Week	2 Hrs (Any or Combination of Theory/Practical/Fieldwork/Internship/Project)
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2022-2023
Implementation Year:	A.Y. 2023-2024
Purpose of Course	- As per NEP(National Education Policy-2020), it is mandatory for students to select a 2 credit Skill Enhancement Course out of the choices given by the college/institute. - It will be mandatory for the student to opt minimum one 2-credit Skill Enhancement Course out of the list of offered courses recognised by the University during semester-1 to semester-5. - The student can start an alternative career in the field by obtaining higher degree of knowledge in the area. - It's aimed at imparting practical skills, embedded internship, hands-on training, soft skills, life skills, such approved online courses etc. to enhance the employability of students. This may also include courses as per the need of new evolving technology.
Course Objective	Obtaining skill in particular field along with the regular curriculum of the selected program is essential. It not only enhance the skill but also provide an opportunity to develop skill in particular area where one can pursue career in future. Skill enhancement provides the opportunity and knowledge for an individual to develop and strengthen the necessary skills to gain, maintain, and advance in a chosen area. Skill enhancement programs are focused around training that combines the best practices from varieties of areas. Skill enhancement or training typically uses a combination of cognitive and behaviour problem solving approaches, both of which are used to strengthen a person's positive skill develop.
Pre-requisite	-
Course outcome	CO1: Student select the area of skill as per his/her interest. The choices will be given by the institute/department. CO2: The student acquire basic and fundamental level of knowledge in the field that the student opted. CO3: Understand the insight of the area and possibility of to explore more in the field. CO4: Understand effective representation of problems in terms addressing the problems. CO5: Learn to upskill and upgrade the knowledge in the area of selected subject.
Course Content and Implementation road-map.	(i) University has categorised and prepared the basket of the courses including approved online courses that can be offered as Skill Enhancement Course. (ii) The institute/college/department can design and implement skill enhancement course by getting approval from the relevant apex body of the university considering the SOP of the certificate course policies of the University. (iii) The institutes/college/departments can select more than one course out of the given sets of courses and offer them to their students.

	(iv) The students can select any of the courses offered by the institute/college/department from the given choices and enrol for the course. (v) The institute/college/department will arrange appropriate resource person(s) for the course. (vi) The course evaluation will be taken place at the college/institute/department level based on the nature of the course. (vii) The institute/college/department will assess the student based on the nature of the course. The student will be granted the credits on successful completion of the course.
Reference Books	- The reference materials and books will be decided by the Institutes/Colleges/Departments based on the selected Courses. - Minimum five copies of relevant topics are recommended to keep in the library.
Teaching Methodology	Class Work/ Discussion/ Self-Study/ Seminars/ field works/ practical training/ field work and/or Assignments.
Evaluation Method	30% Internal assessment. 70% External assessment. Maximum Marks: 50 (Evaluation and Assessment will be carried out at institute level. On successful completion of the course, the student will be granted 2 credits. However, the obtained score will not be considered for S.G.P.A./C.G.P.A.)

Course code: 207
Course Title: Value Addition Course-II (VAC-02)

Course Code	207
Course Title	Value Addition Course - II (VAC – 02)
Credit	2
Category of Course	Value Addition Course
Level of Course	100-199 (Foundation / Introductory)
Teaching per Week	2 Hrs (Any or Combination of Theory/Practical/Fieldwork/Internship/Project)
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2022-2023
Implementation Year:	A.Y. 2023-2024
Purpose of Course	As per NEP(National Education Policy-2020), it is mandatory for students to select a 2 credit Value Addition Course out of the choices given by the college/institute. It will be mandatory for the student to opt minimum one 2-credit Value Addition Course out of the list of offered courses recognised by the University during semester-1 to semester-4. The student can start an alternative career in the field by obtaining higher degree of knowledge in the area.
Course Objective	Obtaining knowledge in all or any of the components/fields like (i) Understanding India (ii) Environmental Science/Education (iii) Digital/Technological solutions (iv) Health & Wellness, Yoga education, sports, and fitness are essential for holistic development (v) Indian Knowledge system(IKS). The course components should be among these five categories/fields and as per the Curriculum and Credit Framework for Undergraduate Programmes of the UGC (Page-22 of the document). The purpose is to impart knowledge and understand the necessities of these aspects in life to make the healthy society and nation. It help in development of a dedicated and responsible citizen of the country by adding value to the life.
Pre-requisite	-
Course outcome	CO1: Student select the area of Value addition as per his/her interest. The choices will be given by the institute/department. CO2: The student acquire basic and fundamental level of knowledge in the field that the student opted. CO3: Understand the insight of the area and possibility of to explore more in the field. CO4: Understand effective representation of problems, solutions and insights of the challenges and problems of the peer subject relevant to value addition. CO5: Learn to upskill and upgrade the knowledge in the area of selected subject.
Course Content and Implementation road-map.	(i) The university has categorised and prepared the list of the courses that can be offered as Value Addition Course. (ii) The institute/college/department can design and implement skill enhancement course by getting approval from the relevant apex body of the university considering the SOP of the certificate course policies of the University. (iii) The institutes/college/departments can select more than one course out of the given sets of courses and offer them to their students. (iv) The students can select any of the courses offered by the institute/college/department from the given choices and enrol for the course. (v) The institute/college/department will arrange appropriate resource person(s) for the course. (vi) The evaluation will be taken place at the college/institute/department based on the nature of the course.

	(vii) The institute/college/department will assess the student based on the nature of the course. The student will be granted the credits on successful completion of the course.
Reference Books	- The reference materials and books will be decided by the Institutes/Colleges/Departments or as per the university guidelines based on the selected Courses. - Minimum five copies of relevant topics are recommended to keep in the library.
Teaching Methodology	Class Work/ Discussion/ Self-Study/ Seminars/ field works/ practical training/ field work and/or Assignments.
Evaluation Method	30% Internal assessment. 70% External assessment. Maximum Marks: 50 (Evaluation and Assessment will be carried out at institute level. On successful completion of the course, the student will be granted 2 credits. However, the obtained score will not be considered for S.G.P.A./C.G.P.A.)

Internship: Student willing to exit the program at the end of the two semesters and to avail the Certificate in Computer Application or exit the program at the end of the first four semesters and to avail the Diploma in Computer Application, it is essential to acquire four credits from internship. A key aspect of the internship is induction into actual work situations. Internships involve working with local industry, government or private organizations, business organizations, artists, crafts persons, and similar entities to provide opportunities for students to actively engage in on-site experiential learning. In option to these internships, the student can avail such four credits by availing two 2-credit university approved courses during any of these semesters. The student is required to enroll and avail these 4-credits and produce the evidence in process to opt the multi-level exit option after successfully completion of first year (two semester) or second year(four semesters).