SOPHIA COLLEGE FOR WOMEN

(EMPOWERED AUTONOMOUS)

Affiliated to the University of Mumbai

Programme: Bachelor of Science

Course: Information Technology

Syllabus for the Academic Year 2023-2024

based on the National Education Policy 2020

SOPHIA COLLEGE FOR WOMEN (EMPOWERED AUTONOMOUS)

PROGRAMME SPECIFIC OUTCOMES	
1	Identify information technology related problems, analyze them and design the system or provide solution to the problem
2	Apply the knowledge obtained and emerge as a Developer, Designer, Tester, Security Analyst, Technical Analyst, Networking related modules
3	To think analytically, creatively and critically in developing robust, extensible and highly maintainable technological solutions to simple and complex problems.

DEPARTMENT OF INFORMATION TECHNOLOGY

	SEMESTER 2		
COURSE TYPE	**COURSE CODE**	**COURSE TITLE**	**CREDITS**
MAJOR	T122MJ	OBJECT ORIENTED PROGRAMMING WITH C++	3
MAJOR PRACTICAL	T122MJP	OBJECT ORIENTED PROGRAMMING WITH C++ PRACTICAL	1
MINOR	T122MN	NUMERICAL STATISTICAL METHODS	3
MINOR PRACTICAL	T122MNP	NUMERICAL STATISTICAL METHODS PRACTICAL	1
OPEN ELECTIVE (OE) 1	TOE201	CONCEPTS OF E-COMMERCE	2
OPEN ELECTIVE (OE) 2	TOE202	GRAPHIC DESIGNING WITH CORELDRAW	2
SKILL ENHANCEMENT COURSE (SEC) 1	TSEC201	WEB PROGRAMMING WITH HTML & CSS	(1+1) =2
SKILL ENHANCEMENT COURSE (SEC) 2	TSEC202	MICROPROCESSOR ARCHITECTURE	(1+1) =2
ABILITY ENHANCEMENT COURSE (AEC)	TAEC201	SOFT SKILLS IN IT	2
VALUE EDUCATION COURSE (VEC)	TVEC201	GREEN TECHNOLOGIES	2

SOPHIA COLLEGE FOR WOMEN (EMPOWERED AUTONOMOUS)

MAJOR: OBJECT ORIENTED PROGRAMMING WITH C++	**Semester – 2**
Course Title: OBJECT ORIENTED PROGRAMMING WITH C++	**Course Code: T122MJ**

Course objectives:

1. The objective of the course is to teach the basic concepts and techniques which form the object-oriented programming paradigm.
2. To learn the concept of class and object using C++ and develop classes for simple applications.
3. To learn the concept of Constructors and destructors in C++ program.
4. To learn the concept of function overloading, operator overloading, virtual functions and polymorphism.
5. Classify inheritance with the understanding of early and late binding, usage of exception handling.
6. To learn the concept of generic programming, templates, file handling.

COURSE OUTCOMES:

The learner will be able to:

1. Creating simple programs using classes and objects in C++.
2. Implement programs using constructors, destructors and operator overloading
3. Apply fundamental algorithmic problems including polymorphism and virtual function.
4. Implement Object Oriented Programs using the concept of inheritance and exceptional handling.
5. Implement Object Oriented Programs using templates and file handling concepts.

Lectures per week (1 Lecture is 60 minutes)		**3**	
Total number of Hours in a Semester		**45**	
Credits		**3**	
Evaluation System	**Semester End Examination**	**2 Hours**	**50 marks**
	Internal Assessment	**--**	**50 marks**

UNIT 1 Concepts	**Object Oriented Methodology:** What is a POP?, Features of POP, Advantages and Disadvantages of POP, Introduction of Object Oriented Programming, Procedural programming vs. object-oriented programming, Benefits and Application of OOPS. **Principles of OOPS:**	15 hours

	OOPS Paradigm, Basic Concepts of OOPS: Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing **Classes and Objects:** Class and Object, Access Modifiers, Member Functions, Friend Function, Friend classes	
UNIT 2 Theories	**Constructors and Destructors:** Constructor, Types of Constructors (Default Constructor, Parameterized Constructor, Copy constructor), Constructor Overloading, Destructor **Polymorphism:** function overloading, operators overloading, overloading unary operators, overloading binary operators, overloading binary operators using friend, Rules for overloading operators, type conversions **Virtual Functions:** Virtual function, Pure Virtual Functions, Static Functions, this Pointer, abstract classes, virtual destructors.	15 hours
UNIT 3 Application	**Inheritance:** Inheritance, access specifier, Derived class, types of inheritance, single inheritance, hierarchical inheritance, multiple inheritance, multilevel inheritance, hybrid inheritance, Ambiguities in multiple inheritance, constructor in derived class **Exception Handling:** Exception Handling Mechanism with example **Templates:** Template, Function Template, Class Template	15 hours

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MAJOR: OBJECT ORIENTED PROGRAMMING WITH C++ PRACTICAL		**Semester – 2**	
Course Title: OBJECT ORIENTED PROGRAMMING WITH C++ PRACTICAL		**Course Code: T122MJP**	
Lectures per week (1 Lecture is 60 minutes)		**2**	
Total number of Hours in a Semester		**30**	
Credits		**1**	
Evaluation System	**Practical Examination**	**2 Hours**	**50 marks**

List of Practical:

1	Basic Programs on Classes and methods
	a. Design an employee class for reading and displaying the employee information, b. Design the class student containing getData() and displayData() as two of its methods which will be used for reading and displaying the student information respectively. Where getData() will be private method.
2	Using friend functions.
	a. Write a friend function for adding the two complex numbers, using a single class, b. Write a friend function for adding the two matrix from two different classes and display its sum.
3	Constructors and method overloading.
	a. Design a class Complex for adding the two complex numbers and also show the use of constructor. b. Design a class Geometry containing the methods area() and volume() and also overload the area() function.
4	Operator Overloading
	a. Overload the operator unary(-) for demonstrating operator overloading. b. Overload the operator + for adding the timings of two clocks.
5	Inheritance
	a. Design a class for single level inheritance b. Design a class for multiple inheritance.
6	Virtual functions and abstract classes

	a. Implement the concept of method overriding. b. Show the use of virtual function.	
7	Exception handling	
	a. Show the implementation of exception handling b. Show the implementation for exception handling for strings.	
8	Templates	
	a. Show the implementation of template class library for swap function. b. Design the template class library for sorting ascending to descending and viceversa	

REFERENCES:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1	Object Oriented Analysis and Design	Timothy Budd	TMH	3rd	2012
2	Mastering C++	K R Venugopal, RajkumarBuyya, T Ravishankar	Tata McGraw Hill	2nd Edition	2011
3	C++ for beginners	B. M. Hirwani	SPD		2013
4	Effective Modern C++	Scott Meyers	SPD		
5	Object Oriented Programming with C++	E. Balagurusamy	Tata McGraw Hill	4th	
6	The complete Reference C++	Herbert Schildt	Tata McGraw Hill	4th Edition	2003

SOPHIA COLLEGE FOR WOMEN (EMPOWERED AUTONOMOUS)

MINOR: NUMERICAL AND STATISTICAL METHODS	**Semester – 2**
Course Title: NUMERICAL AND STATISTICAL METHODS	**Course Code: T122MN**

COURSE OBJECTIVES:

1. To develop the student's ability to deal with numerical and quantitative issues.
2. To enable the use of statistical and algebraic techniques wherever relevant.
3. To have a proper understanding of Statistical applications in IT and Research industry.

COURSE OUTCOMES:

Upon successful completion of the course the students will be able to

1. Develop a framework for estimating and predicting the different sample of data for handling the uncertainties.
2. Understand error, source of error and its effect on any numerical computation and also analysing the efficiency of any numerical algorithm.
3. Learn how to obtain numerical solution of nonlinear equations using Bisection, Newton – Raphson and Regula – Falsi method iteration methods.

Lectures per week (1 Lecture is 60 minutes)		**3**	
Total number of Hours in a Semester		**45**	
Credits		**3**	
Evaluation System	**Semester End Examination**	**2 Hours**	**50 marks**
	Internal Assessment	**--**	**50 marks**

UNIT 1 Concepts	**Mathematical Modeling and Engineering Problem Solving:** A Simple Mathematical Model, Conservation Laws and Engineering Problems. **Approximations and Round-Off Errors:** Significant Figures, Accuracy and Precision, Error Definitions, Round-Off Errors.	**15 hours**
UNIT 2 Theories	**Solutions of Algebraic and Transcendental Equations:** The Bisection Method, The Newton-Raphson Method, The Regula-falsi method **Interpolation:** Newton's Forward Difference Interpolation, Newton's Backward Difference Interpolation, Lagrange's Interpolation	**15 hours**
UNIT 3 Application	**Numerical differentiation and Integration:** Numerical integration using Trapezoidal Rule, Simpson's 1/3rd and 3/8th rules. **Numerical solution of 1st and 2nd order differential equations:** Euler's Method, Modified Euler's Method, Runge-Kutta Method for 1st and 2nd Order Differential Equations.	**15 hours**

SOPHIA COLLEGE FOR WOMEN (EMPOWERED AUTONOMOUS)

MINOR: NUMERICAL AND STATISTICAL METHODS PRACTICAL			**Semester – 2**
Course Title: NUMERICAL AND STATISTICAL METHODS PRACTICAL		**Course Code: T122MNP**	
Lectures per week (1 Lecture is 60 minutes)		**2**	
Total number of Hours in a Semester		**30**	
Credits		**1**	
Evaluation System	**Practical Examination**	**2 Hours**	**50 marks**

List OF PRACTICAL	
1.	Program to solve algebraic and transcendental equation by bisection method.
2.	Program to solve algebraic and transcendental equation by false position method.
3.	Program to solve algebraic and transcendental equation by Newton Raphson method.
4.	Program for Lagrange's interpolation.
5.	Program for numerical integration using Trapezoidal rule.
6.	Program for numerical integration using Simpson's $1/3^{rd}$ rule.
7.	Program to solve differential equation using Euler's method
8.	Program to solve differential equation using Runge-kutta 2^{nd} order method.
9.	Program to solve differential equation using Runge-kutta 4^{th} order method.

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Introductory Methods of Numerical Methods	S. S. Shastri	PHI	Vol – 2	
2.	Numerical Methods for Engineers	Steven C. Chapra, Raymond P. Canale	Tata McGraw Hill	6th	2010
3.	Numerical Analysis	Richard L. Burden, J. Douglas Faires	Cengage Learning	9th	2011
4.	Fundamentals of Mathematical Statistics	S. C. Gupta, V. K. Kapoor			
5.	Elements of Applied Mathematics	P.N.Wartikar and J.N.Wartikar	A. V. Griha, Pune	Volume 1 and 2	

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OE 1: Concepts of E-Commerce	Semester – 2
Course Title: Concepts of E-Commerce	**Course Code: TOE201**

COURSE OBJECTIVES:

1. Analyze the impact of E-commerce on business models and strategy
2. Describe the major types of E-commerce
3. Elaborate on Risks in Electronic Payment systems
4. List and explain WWW tools
5. Discuss benefits of EDI

COURSE OUTCOMES:

1. Understand the framework and anatomy of ecommerce applications and analyze ecommerce consumer, & organizational applications
2. Infer mercantile process models from both merchantile's and consumer's view point
3. Understand the implementation of Electronic Data Interchange (EDI) in day-to-day life

Lectures per week (1 Lecture is 60 minutes)	**2**
Total number of Hours in a Semester	**30**
Credits	**2**

UNIT 1	Introduction on Electronic Commerce, Benefits of Electronic Commerce, Services, Types of Electronic Commerce, Applications of E-Commerce, Value Chain Integration, Supply Chain Integration, Financial and Information Services, Examples of Today's E-Commerce, On-line Web selling, home banking and financial services, Internet and WWW tools	15 hours
UNIT 2	Mercantile Process models, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risks in Electronic Payment systems, Electronic Data Interchange, Benefits of EDI, EDI layered architecture	15 hours

REFERENCES:

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	E-COMMERCE An Indian Perspective	P.T.Joseph, S.J.		Third	2009
2.	The Complete E-Commerce Book	Janice Rehnolds		Second	

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OE 2: GRAPHIC DESIGNING WITH CORELDRAW	**Semester – 2**
Course Title: GRAPHIC DESIGNING WITH CORELDRAW	**Course Code: TOE202**

COURSE OBJECTIVES:

1. CorelDraw course enables participants to develop appealing vector designs, icons, products, brochures, and web advertisements or banners.
2. Students will also use the prepress techniques to ensure that the outputs are perfect in terms of color requirements

COURSE OUTCOMES:

1. The students will be able to effectively & efficiently produce formatted text and graphics.
2. They will be design visiting cards, letterheads, flyers, brochures, books, magazines and newspaper editing

Lectures per week (1 Lecture is 60 minutes)	**2**
Total number of Hours in a Semester	**30**
Credits	**2**

UNIT 1	**Introduction to CorelDRAW** Basics of CorelDRAW, Vector Graphics and Bitmaps, Starting and Opening Drawings, Previewing Drawings, Viewing Modes, Saving and Closing Drawings, CorelDRAW Workspace **Pages and Layout** Pages and Layout Tools, Page Layout and Background Adding and Deleting Pages, Rulers Lines, Shapes, and Outlines, Lines, Outlines, and Brushstrokes, Shapes and Shape Objects Drawing Ellipses, Circles, Arcs, and Pie Shapes, Drawing Lines in CorelDraw, Drawing Rectangles, Squares, Polygons and Stars	15 hours
UNIT 2	**Working with Objects, Symbols, and Layers** Choosing Colours, Creating and Editing Colour Palettes Uniform Fills and Fountain Fills, Vector and Bitmap Pattern Fills Texture, PostScript, and Mesh Fills, Object Transparency Managing Colours **Working with Text** Adding and Manipulating Text, Formatting Text, Managing Fonts Writing Tools, Cloning objects, applying colour and tone effects, designing visiting cards, greeting cards and letterheads **Web Graphics** File Formats, Importing and Exporting Files, Exporting to PDF Supported File Formats	15 hours

REFERENCES:

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	CorelDraw 10: The Official Guide	Steve Bain, Nick Wilkinson	McGraw Hill Professional	2nd	2010
2.	CorelDraw 12: The Official Guide	Steve Bain	McGraw-Hill Companies	2nd	2012
3.	CorelDraw 15: The Professional Reference/Book	Bouton, Gary David, Miller, Deborah	New Riders Pub	1st	2015

SEC 1: WEB PROGRAMMING WITH HTML & CSS	**Semester – 2**
COURSE TITLE: WEB PROGRAMMING WITH HTML & CSS	**Course Code: TSEC201**

COURSE OBJECTIVES:

1. The course has been designed to students to build their career in web designing.
2. They will have the knowledge to build and understand the fundamentals of the web.
3. Html and CSS are the frameworks used to build websites.

COURSE OUTCOMES:

HTML allows students to structure webpage content, while CSS affects the layout and styling. After finishing this course, students will have a solid foundation in building basic websites. The learner will be able to:

1. Insert a graphic within a web page.
2. Create a link within a web page.
3. Create a table within a web page.
4. Insert heading levels within a web page.
5. Insert ordered and unordered lists within a web page.
6. Use cascading style sheets.
7. Create a web page

Lectures per week (1 Lecture is 60 minutes)	**1**
Total number of Hours in a Semester	**15**
Credits	**1**

UNIT 1	**HTML5:** Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors. Style sheets, CSS formatting text using style sheets, formatting paragraphs using style sheets. **HTML5: Page layout and navigation:**	15 hours

Creating navigational aids: planning site organization, creating text-based navigation bar, creating graphics-based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division-based layouts: HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, positioning and formatting divisions.

HTML5: Tables, Forms and Media:
Creating tables: creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment, creating user forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page.

HTML5: Cascading Style Sheets (CSS)
Inline style sheets, Embedded style sheets, Linked style sheets, Style paragraphs with CSS, formatting text with CSS and formatting paragraphs with CSS

SEC 1: WEB PROGRAMMING WITH HTML & CSS		**Semester – 2**	
Course Title: WEB PROGRAMMING WITH HTML & CSS		**Course Code: TSEC201**	
Lectures per week (1 Lecture is 60 minutes)		**2**	
Total number of Hours in a Semester		**30**	
Credits		**1**	
Evaluation System	**Practical Examination**	**2 Hours**	

List of Practical:

1	Design a web page using different text formatting tags.
2	Design a web page with links to different pages and allow navigation between web pages.
3	Design a web page with different tables. Design a webpages using table so that the content appears well placed.
4	Design a web page with a form that uses all types of controls.
5	Design a web page embedding with multimedia features.
6	Design a web page demonstrating all Style sheet types

REFERENCES:

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Web Design The Complete Reference	Thomas Powell	Tata McGrawHill	3rd	2010
2.	HTML 5 for Beginners	Faithe Wempen	Microsoft Press	2nd	2011
3.	HTML 5.1 Step by Step	Ivan Bayross Sharanam Shah,	SPD	4th	2013

SEC 2: MICROPROCESSOR ARCHITECTURE	**Semester – 2**
COURSE TITLE: MICROPROCESSOR ARCHITECTURE	**Course Code: TSEC202**

COURSE OBJECTIVES:

1. To introduce the basics of 8085 Microprocessor Architecture and its operations as an entry level course.
2. To learn Microcomputer System and Microprocessor-Based System Applications
3. To introduce Assembly Language Programming and Overview of 8085 Instruction Set

COURSE OUTCOMES:

1. Apply knowledge of Microprocessor, microcomputers and its applications
2. Understand 8085 Microprocessor unit and 8085-Based Single Board microcomputer
3. Writing assembling and execution of simple Assembly Language programs

Lectures per week (1 Lecture is 60 minutes)	**1**
Total number of Hours in a Semester	**15**
Credits	**1**

UNIT 1	**Microprocessor, microcomputers, and Assembly Language:** Microprocessor, Microprocessor Instruction Set and Computer Languages, From Large Computers to Single-Chip Microcontrollers, Applications. **Microprocessor Architecture and Microcomputer System:** Microprocessor Architecture and its operation's, Microcomputer System, Microprocessor-Based System Application. **8085 Microprocessor Architecture and Memory Interface:** Introduction, 8085 Microprocessor unit, Memory Interfacing, Testing and Troubleshooting Memory Interfacing Circuit, 8085-Based SingleBoard microcomputer. **Introduction to 8085 Assembly Language Programming:** The 8085 Programming Model, Instruction Classification, Instruction, Data and Storage, Writing assembling and Execution of a simple program, Overview of 8085 Instruction Set, Writing and Assembling	15 hours

	Program. **Introduction to 8085 Instructions:** Data Transfer Operations, Arithmetic Operations, Logic Operation, Branch Operation, Writing Assembly Languages Programs, Debugging a Program, Stacks and Sub-Routines, Interrupts.	

SEC 2: MICROPROCESSOR ARCHITECTURE PRACTICAL		**Semester – 2**	
COURSE TITLE: MICROPROCESSOR ARCHITECTURE PRACTICAL		**Course Code: TSEC202**	
Lectures per week (1 Lecture is 60 minutes)		**2**	
Total number of Hours in a Semester		**30**	
Credits		**1**	
Evaluation System	**Practical Examination**	**2 Hours**	

List of Practical	
1.	**Perform the following Operations related to memory locations:**
a.	Store the data byte 32H into memory location 4000H.
b.	Exchange the contents of memory locations 2000H and 4000H
2.	**Simple assembly language programs.**
a.	Subtract the contents of memory location 4001H from the memory location 2000H and place the result in memory location 4002H.
b.	Subtract two 8-bit numbers.
3.	**Implement Addition**
a.	Add the 16-bit number in memory locations 4000H and 4001H to the 16-bit number in memory locations 4002H and 4003H. The most significant eight bits of the two numbers to be added are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.
b.	Add the contents of memory locations 4000H and 4001H and place the result in the memory locations 4002Hand 4003H.
4.	**Implement Subtraction**
a.	Subtract the 16-bit number in memory locations 4002H and 4003H from the 16-bit number in memory locations 4000H and 4001H. The most significant eight bits of the two numbers are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.

5.	**Implement Complement**
a.	Find the l's complement of the number stored at memory location 4400H and store the complemented number at memory location 4300H.
b.	Find the 2's complement of the number stored at memory location 4200H and store the complemented number at memory location 4300H.
6.	**Register Operations.**
a.	Write a program to shift eight-bit data four bits right. Assume that data is in register C.
b.	Program to shift a 16-bit data 1 bit left. Assume data is in the HL register pair
c.	Write a set of instructions to alter the contents of flag register in 8085.
d.	Write a program to count number of l's in the contents of D register and store the count in the B register.
7.	**Multiple memory locations.**
a.	Calculate the sum of series of numbers. The length of the series is in memory location 4200H and the series begins from memory location 4201H. a. Consider the sum to be 8 bit number. So, ignore carries. Store the sum at memory location 4300H. b. Consider the sum to be 16 bit number. Store the sum at memory locations 4300H and 4301H
b.	Multiply two 8-bit numbers stored in memory locations 2200H and 2201H by repetitive addition and store the result in memory locations 2300H and 2301H.
c.	Divide 16 bit number stored in memory locations 2200H and 2201H by the 8 bit number stored at memory location 2202H. Store the quotient in memory locations 2300H and 2301H and remainder in memory locations 2302H and 2303H.
8.	**Calculations with respect to memory locations and String operations in assembly programs.**
a.	Write a program to sort given 10 numbers from memory location 2200H in the ascending order.
b.	Calculate the sum of series of even numbers from the list of numbers. The length of the list is in memory location 2200H and the series itself begins from memory location 2201H. Assume the sum to be 8 bit number so you can ignore carries and store the sum at memory location 2Sample problem:

c.	Calculate the sum of series of odd numbers from the list of numbers. The length of the list is in memory location 2200H and the series itself begins from memory location 2201H. Assume the sum to be 16-bit. Store the sum at memory locations 2300H and 2301H.
d.	Find the square of the given numbers from memory location 6100H and store the result from memory location 7000H
e.	Write an assembly language program to generate fibonacci number
f.	Program to calculate the factorial of a number between 0 to 8.
g.	Write an 8085 assembly language program to insert a string of four characters from the tenth location in the given array of 50 characters
h.	Write an 8085 assembly language program to delete a string of 4 characters from the tenth location in the given array of 50 characters.

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Microprocessors Architecture, Programming and Applications with the 8085.	Ramesh Gaonkar	PENRAM	Fifth	2012
2.	8080A/8085 Assembly Language Programming	Lance A. Leventhel	Osborne		1978

SOPHIA COLLEGE FOR WOMEN (EMPOWERED AUTONOMOUS)

AEC : SOFT SKILLS IN IT	Semester – 2
Course Title: Soft Skills in IT	Course Code: TAEC201

COURSE OBJECTIVES:

1. The course is intended to emphasize the essential aspects of effective Business Communication at Work Place. Familiarize students with the basics of Reading and Oral Communication at work place.
2. The course is designed to empower students to carry out day to day communication at the work place. To impart adequate understanding of various types of communication to facilitate effective interpersonal communication. To impart the correct practices and strategies of Effective Reading and writing at workplace
3. This course is designed to develop the skills of the students in preparing Emails and Resumes for job search.

COURSE OUTCOMES:

1. The students should be able to: Apply effective writing at workplace and develop competence in making resumes.
2. The students will be able to apply good Reading and Oral Communication Skills at their workplace.
3. The student will be able to write impressive emails, letters and also learn to make and give effective presentations.

Lectures per week (1 Lecture is 60 minutes)	**2**
Total number of Hours in a Semester	**30**
Credits	**2**

UNIT 1 Concepts	**READING SKILLS** Objectives , Introduction: Reading , Types of reading , Reading to study type of reading **NOTE MAKING AND PRECISE WRITING** Objectives , Note Making: Introduction , Note-making or note-taking , Note-making techniques , Note-making tips , Checklist/tips , Précis Writing: Introduction **Business Communication at Work Place** Objectives: Introduction , Nature and Functions of Letters , Principles of Letter Writing , Format of a Letter , Letter Components and Layouts , Process of Letter Writing. **Oral communication** Objectives , Introduction: Oral Communication Skills , Importance of Oral Communication in Business , Face to Face Communication , Telephone Communication , Communication with Visitors	15 hours

UNIT 2 Theories	**Email communication** Introduction, Advantages of email, problems in email communication, Email etiquettes, Techniques of writing Effective Email **Careers and Resume** Introduction to career building, resume format, traditional, electronic and video resumes, sending resume, follow up letters and online recruitment process **AUDIO VIDEO AIDS AND EFFECTIVE PRESENTATIONS** Objectives , Introduction , Formal Presentations , Informal Presentations , Preparation of Presentations , Guidelines , Body Language , Visual Aid	15 hours

REFERENCES:

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Effective Business Communication	Herta Murphy, Herbert Hildebrandt, Jane Thomas	Tata McGraw Hill	7 th edition	2008
2.	Business and Professional Communication	James R. DiSanza Nancy J..Legge	Pearson Education	4 th Edition	
3.	Storytelling with data-a data visualization guide for business professionals	Cole Nussbaumerknaflic	Wiley		

SOPHIA COLLEGE FOR WOMEN (EMPOWERED AUTONOMOUS)

VEC: GREEN TECHNOLOGIES	**Semester – 2**
Course Title: GREEN TECHNOLOGIES	**Course Code: TVEC201**

COURSE OBJECTIVES:

1. Encouraging optimized software and hardware designs for development of Green IT Storage, Communication and Services
2. Describes the life cycle of electronic devices.

COURSE OUTCOMES:

1. Learning about green IT can be achieved by hardware, software, network communication and data center operations.
2. Understand the strategies, frameworks, processes and management of green IT

Lectures per week (1 Lecture is 60 minutes)	**2**
Total number of Hours in a Semester	**30**
Credits	**2**

UNIT 1	**Green Devices and Hardware:** Introduction, Life Cycle of a Device or Hardware. **Green Software:** Introduction, Processor Power States, Energy-Saving Software Techniques, Evaluating and Measuring Software Impact to Platform Power **Sustainable Software Development:** Introduction, Current Practices, Sustainable Software, Software Sustainability Attributes, Software Sustainability Metrics, Sustainable Software Methodology, Defining Actions	15 hours
UNIT 2	**Enterprise Green IT Strategy:** Introduction, Approaching Green IT Strategies, Business Drivers of Green IT Strategy, Business Dimensions for Green IT Transformation, Organizational Considerations in a Green IT Strategy, Steps in Developing a Green IT Strategy, Metrics and Measurements in Green Strategies. **Sustainable Information Systems and Green Metrics:** Introduction, Multilevel Sustainable Information, Sustainability Hierarchy Models, Product Level Information, Individual Level Information, Functional Level Information, Organizational Level Information, Measuring the Maturity of Sustainable ICT	15 hours

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Harnessing Green IT: Principles and Practices	San Murugesan, G. R. Ganadharan	Wiley & IEEE.		
2.	Green IT	Deepak Shikarpur	Vishwkarma Publications		2014
3.	Green Communications: Principles, Concepts and Practice	Samdanis et al	J. Wiley		
4.	Green IT for Sustainable Business Practice: An ISEB Foundation Guide	Mark G. O'Neill	The Chartered Institute for IT		2010