



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## I SEMESTER

### HS3152 PROFESSIONAL ENGLISH - I

Students will be able to

CO1	Use appropriate words in a professional context.
CO2	Explain the basic grammatic structures and use them in right context.
CO3	Describe the denotative and connotative meanings of technical texts
CO4	Summarize about the definitions, descriptions, narrations and essays on various topics
CO5	Apply language effectively in professional contexts
CO6	Discuss the importance of read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

### MA3151 MATRICES AND CALCULUS

Students will be able to

CO1	Use the matrix algebra methods for solving practical problems.
CO2	Apply differential calculus tools in solving various application problems.
CO3	Describe the partial differential equations with initial and Lagrange's method by using certain techniques with engineering applications.
CO4	Carry out the differentiation to solve maxima and minima problems.
CO5	Explain different methods of integration in solving practical problems.
CO6	Determine multiple integral ideas in solving areas, volumes and other practical problems.

### PH3151 ENGINEERING PHYSICS

Students will be able to

CO1	Acknowledge the importance of mechanics.
CO2	Express their knowledge in electromagnetic waves.
CO3	Demonstrate a strong foundational knowledge in oscillations.
CO4	Establish a strong foundational knowledge in fibre optics and laser.
CO5	Comprehend the importance of quantum physics.
CO6	Comprehend and apply quantum mechanical principles towards the formation of energy bands.

### CY8151 ENGINEERING CHEMISTRY

Students will be able to

CO1	Describe the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
CO2	Apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
CO3	Use the knowledge of phase rule and composites for material selection requirements.
CO4	Explain the recommend suitable fuels for engineering processes and applications
CO5	Discuss the different forms of energy resources and apply them for suitable applications in energy sectors.
CO6	Determine the importance of engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## GE3151 PROBLEM SOLVING AND PYTHON PROGRAMMING

Students will be able to

CO1	Develop algorithmic solutions to simple computational problems.
CO2	Design and execute simple Python programs.
CO3	Write simple Python programs using conditionals and loops for solving problems.
CO4	Describe a Python program into functions.
CO5	Discuss compound data using Python lists, tuples, dictionaries etc.
CO6	Explain the importance of Read and write data from/to files in Python programs.

## GE3152 HERITAGE OF TAMILS

Students will be able to

CO1	Discuss the Tamil language and literature.
CO2	Explain about the modern-art sculpture.
CO3	Illustrate the folk and martial arts.
CO4	Describe the Thinaï concepts of Tamil.
CO5	Summarize the contribution of Tamil in Indian culture.
CO6	Define the role of Siddha medicine.

## GE3171 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

Students will be able to

CO1	Develop algorithmic solutions to simple computational problems
CO2	Design and execute simple Python programs.
CO3	Implement programs in Python using conditionals and loops for solving problems.
CO4	Describe functions to decompose a Python program.
CO5	Explain compound data using Python data structures.
CO6	Utilize Python packages in developing software applications.

## BS3171 PHYSICS AND CHEMISTRY LABORATORY

Students will be able to

CO1	Explain the functioning of various physics laboratory equipment
CO2	Use graphical models to analyze laboratory data.
CO3	Apply mathematical models as a medium for quantitative reasoning and describing physical reality.
CO4	Describe products and processes and explain their uses and purposes clearly and accurately. Access, process and analyze scientific information.
CO5	Solve problems individually and collaboratively.
CO6	Determine the amount of metal ions through volumetric and spectroscopic techniques.



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## GE3172 ENGLISH LABORATORY

Students will be able to

CO1	Describe and comprehend general as well as complex academic information.
CO2	Explain different points of view in a discussion.
CO3	Explain formal and informal communicative contexts.
CO4	Describe products and processes and explain their uses and purposes clearly and accurately.
CO5	Express their opinions effectively in both formal and informal discussions.
CO6	Use language efficiently in expressing their opinions via various media.

## II SEMESTER

### HS3252 PROFESSIONAL ENGLISH - II

Students will be able to

CO1	Compare and contrast products and ideas in technical texts.
CO2	Identify and report cause and effects in events, industrial processes through technical texts.
CO3	Analyse problems in order to arrive at feasible solutions and communicate them in the written format.
CO4	Explain the importance of present their ideas and opinions in a planned and logical manner.
CO5	Design effective resumes in the context of job search.
CO6	Demonstrate an understanding of job applications and interviews for internship and placements.

### MA3251 STATISTICS AND NUMERICAL METHODS

Students will be able to

CO1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
CO2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
CO3	Describe the numerical techniques of interpolation in various intervals.
CO4	Apply the numerical techniques of differentiation and integration for engineering problems.
CO5	Explain various techniques and methods for solving first and second order ordinary differential equations.
CO6	Describe the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

### PH3256 PHYSICS FOR INFORMATION SCIENCE

Students will be able to

CO1	Explain classical and quantum electron theories, and energy band structures.
CO2	Describe about the basics of semiconductor physics and its applications in various devices
CO3	Explain magnetic properties of materials and their applications in data storage.
CO4	Explain the functioning of optical materials for optoelectronics



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### REGULATION 2021

### COURSE OUTCOMES (CO)

<b>CO5</b>	Describe the basics of quantum structures and their applications
<b>CO6</b>	Explain the basics of quantum mechanics

### BE3251 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

#### Students will be able to

<b>CO1</b>	Compute the electric circuit parameters for simple problems
<b>CO2</b>	Explain the working principle and applications of electrical machines
<b>CO3</b>	Analyze the characteristics of analog electronic devices
<b>CO4</b>	Explain the basic concepts of digital electronics
<b>CO5</b>	Explain the operating principles of measuring instruments
<b>CO6</b>	Describe the functional elements and working of measuring instruments

### GE3251 ENGINEERING GRAPHICS

#### Students will be able to

<b>CO1</b>	Use BIS conventions and specifications for engineering drawing.
<b>CO2</b>	Construct the conic curves, involutes and cycloid.
<b>CO3</b>	Solve practical problems involving projection of lines.
<b>CO4</b>	Draw the orthographic, isometric and perspective projections of simple solids.
<b>CO5</b>	Draw the development of simple solids.
<b>CO6</b>	Draw engineering curves

### CS3251 PROGRAMMING IN C

#### Students will be able to

<b>CO1</b>	Illustrate the constructs of C Language.
<b>CO2</b>	Develop C Programs using basic programming constructs
<b>CO3</b>	Develop C programs using arrays and strings
<b>CO4</b>	Develop modular applications in C using functions
<b>CO5</b>	Develop applications in C using pointers and structures
<b>CO6</b>	Explain the importance of input/output and file handling in C

### GE3252 TAMILS AND TECHNOLOGIES

#### Students will be able to

<b>CO1</b>	Explain about the weaving and pottery technology in Tamilnadu.
<b>CO2</b>	Describe about the design and construction technology in Tamilnadu.
<b>CO3</b>	Discuss about the manufacturing technology in Tamilnadu.
<b>CO4</b>	Illustrate the agriculture and irrigation technology in Tamilnadu.
<b>CO5</b>	Define the growth of science in Tamil.
<b>CO6</b>	Learn the contribution of the Tamils to Indian culture.



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## GE3271 ENGINEERING PRACTICES LABORATORY

Students will be able to

CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan;
CO2	Explain various joints in wood materials used in common household wood work.
CO3	Design various wire electrical joints in common household electrical wire work.
CO4	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments.
CO5	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.
CO6	Design a tray out of metal sheet using sheet metal work.

## CS3271 PROGRAMMING IN C LABORATORY

Students will be able to

CO1	Demonstrate knowledge on C programming constructs.
CO2	Develop programs in C using basic constructs
CO3	Design programs in C using arrays.
CO4	Design applications in C using strings, pointers, functions.
CO5	Develop applications in C using structures.
CO6	Explain the importance of C using file processing.

## GE3272 COMMUNICATION LABORATORY

Students will be able to

CO1	Speak effectively in group discussions held in formal/semi formal contexts.
CO2	Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions.
CO3	Write emails, letters and effective job applications.
CO4	Write critical reports to convey data and information with clarity and precision.
CO5	Give appropriate instructions and recommendations for safe execution of tasks.
CO6	Discuss the safety issues about electrical devices.

## III SEMESTER

### MA3354 DISCRETE MATHEMATICS

Students will be able to

CO1	Explain the concepts needed to test the logic of a program.
CO2	Describe the identifying structures on many levels.
CO3	Explain the importance of class functions which transform a finite set into another finite set which relates to input and output functions in computer science.
CO4	Apply counting principles.
CO5	Explain concepts and properties of algebraic structures such as groups, rings and fields.
CO6	Describe the concepts and significance of lattices and boolean algebra which are widely used in computer science and engineering.



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## CS3351 DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

Students will be able to

CO1	Design various combinational digital circuits using logic gates
CO2	Design sequential circuits and analyze the design procedures
CO3	Identify the characteristics of I/O communication
CO4	Analyze different types of control design and identify hazards
CO5	Identify the characteristics of various memory systems
CO6	State the fundamentals of computer systems and analyze the execution of an instruction

## CS3352 FOUNDATIONS OF DATA SCIENCE

Students will be able to

CO1	Define the data science process
CO2	Describe different types of data description for data science process
CO3	Explain the importance of relationships between data
CO4	Apply Python Libraries for Data Wrangling
CO5	Apply visualization Libraries in Python to interpret and explore data
CO6	Apply Pandas for data manipulation.

## CS3301 DATA STRUCTURES

Students will be able to

CO1	Define linear and non-linear data structures.
CO2	Apply linear data structure operations.
CO3	Apply non-linear data structure operations on various applications.
CO4	Illustrate appropriate linear/non-linear data structure operations for solving a given problem.
CO5	Apply appropriate graph algorithms for graph applications.
CO6	Analyze the various searching and sorting algorithms.

## CS3391 OBJECT ORIENTED PROGRAMMING

Students will be able to

CO1	Apply the concepts of classes and objects to solve simple problems
CO2	Design programs using inheritance, packages and interfaces
CO3	Explain the use of exception handling mechanisms to solve real world problems
CO4	Apply the concept of multithreaded model to solve real world problems
CO5	Design Java applications with I/O packages, string classes, Collections and generics concepts
CO6	Describe the concepts of event handling and JavaFX components and controls for developing GUI based applications



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## CS3311 DATA STRUCTURES LABORATORY

Students will be able to

CO1	Apply Linear data structure algorithms on various applications.
CO2	Design applications using Stacks and Linked lists
CO3	Apply Binary Search tree and AVL tree operations.
CO4	Explain the importance of graph algorithms.
CO5	Analyze the various sorting algorithms.
CO6	Analyze the various searching algorithms.

## CS3381 OBJECT ORIENTED PROGRAMMING LABORATORY

Students will be able to

CO1	Design and develop java programs using object oriented programming concepts
CO2	Develop simple applications using object oriented concepts such as package, exceptions
CO3	Explain multithreading concepts
CO4	Create GUIs and event driven programming applications for real world problems
CO5	Design and deploy web applications using Java
CO6	Describe about generics concepts

## CS3361 DATA SCIENCE LABORATORY

Students will be able to

CO1	Apply python libraries for data science
CO2	Explain the basic Statistical measures for data science.
CO3	Describe Probability measures for data science.
CO4	Illustrate descriptive analytics on the benchmark data sets.
CO5	Apply correlation and regression analytics on standard data sets
CO6	Explain and interpret data using visualization packages in Python.

## GE3361 PROFESSIONAL DEVELOPMENT

Students will be able to

CO1	Use of MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
CO2	Apply MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
CO3	Prepare MS EXCEL to visualize data for ease of understanding
CO4	Load MS EXCEL to visualize data for ease of understanding
CO5	Explain MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs
CO6	Operate MS PowerPoint to interlinking other elements, and using media objects.



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

## IV SEMESTER

### CS3452 THEORY OF COMPUTATION

Students will be able to

CO1	Construct automata theory using Finite Automata
CO2	Write regular expressions for any pattern
CO3	Design context free grammar
CO4	Design Turing machine for computational functions
CO5	Differentiate between decidable and undecidable problems
CO6	Design Pushdown Automata

### CS3491 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Students will be able to

CO1	Apply appropriate search algorithms for problem solving
CO2	Apply reasoning under uncertainty
CO3	Design supervised learning models
CO4	Build unsupervised learning models
CO5	Describe deep learning neural network models
CO6	Design ensembling models

### CS3492 DATABASE MANAGEMENT SYSTEMS

Students will be able to

CO1	Construct SQL Queries using relational algebra
CO2	Design database using ER model and normalize the database
CO3	Construct queries to handle transaction processing and maintain consistency of the database
CO4	Compare and contrast various indexing strategies
CO5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.
CO6	Apply the knowledge to tune the performance of the database

### CS3401 ALGORITHMS

Students will be able to

CO1	Analyze the efficiency of algorithms using various frameworks
CO2	Apply graph algorithms to solve problems and analyze their efficiency.
CO3	Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems
CO4	Describe state space tree method for solving problems.
CO5	Solve problems using approximation algorithms.
CO6	Explain the importance of randomized algorithms for problem solving.





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATION 2021

## COURSE OUTCOMES (CO)

### CS3451 INTRODUCTION TO OPERATING SYSTEMS

Students will be able to

CO1	Explain basic functions of operating systems, processes and threads
CO2	Analyze various scheduling algorithms and process synchronization.
CO3	Explain deadlock prevention and avoidance algorithms.
CO4	Compare and contrast various memory management schemes.
CO5	Explain the functionality of file systems, I/O systems, and Virtualization
CO6	Compare iOS and Android Operating Systems

### GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

Students will be able to

CO1	Explain the importance of environment, need for public awareness and types of biodiversity
CO2	Describe about environmental pollution, environmental protection and environmental protection acts.
CO3	Summarize renewable sources of energy
CO4	Discover sustainability concept, needs and challenges
CO5	Discuss about material life cycle assessment, energy cycles and carbon cycle
CO6	Explain about Zero waste and R concept

### CS3461 OPERATING SYSTEMS LABORATORY

Students will be able to

CO1	Define and implement UNIX Commands.
CO2	Compare the performance of various CPU Scheduling Algorithms.
CO3	Compare and contrast various Memory Allocation Methods.
CO4	Define File Organization and File Allocation Strategies.
CO5	Illustrate various Disk Scheduling Algorithms.
CO6	Explain Deadlock Avoidance and Deadlock Detection Algorithms

### CS3481 DATABASE MANAGEMENT SYSTEMS LABORATORY

Students will be able to

CO1	Create databases with different types of key constraints.
CO2	Construct simple and complex SQL queries using DML and DCL commands.
CO3	Illustrate advanced features such as stored procedures and triggers and incorporate in GUI based application development
CO4	Design an XML database and validate with meta-data (XML schema).
CO5	Create and manipulate data using NOSQL database.
CO6	Create nested and joint queries.