

# **SUBBALAKSHMI LAKSHMIPATHY COLLEGE OF SCIENCE**

## **AN AUTONOMOUS INSTITUTION**



Affiliated to Madurai Kamaraj University and Re-accredited with B+ Status by NAAC  
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### **DEPARTMENT OF COMPUTER SCIENCE (SSS)**

#### **DEPARTMENT VISION**

To produce Quality Human Resource with Information Security Technological Skills and Software Development skills to meet Global and Local Software Industry needs.

#### **DEPARTMENT MISSION**

- ❖ Exposure in latest tools and Technologies in the area of Information Security.
- ❖ Establishment of quality education to meet the need of the Software Industry.
- ❖ Promote Innovative Projects/Hands on training to the students in the emerging areas of Software Technology convergence.
- ❖ Enhancement of Job Opportunities through Industry Institute Interaction Program.

## **Programme Educational Objectives (PEO)**

The graduates will be able to:

### **PEO1:**

Equip themselves in the field of Computer Science by imbibing the knowledge gained from specialized courses like Penetration Testing and Cyber Forensics by using ICT teaching methods for meeting the modern international standards.

### **PEO2:**

Prepare them-selves to get employable in a software industry and to enrich their technical skills to meet the technological change by providing modernized curriculum and value addition courses on recent technologies.

### **PEO3:**

Apply ethical principles in their day to day life as well as professional career and take social responsibilities to live with ethical values.

### **PEO4:**

Adapt to rapidly changing work environment by enriching their technical skills and to get recognized by their superiors and peers for their lifelong learning skills.

## **Programme Outcomes (PO)**

Students will be able to

### **PO1 Disciplinary knowledge:**

Apply the subject knowledge gained through curriculum which inculcates the core discipline Computer Science, and other disciplines Networking and Mathematics.

### **PO2 Communication Skills:**

Prepare them to communicate effectively with the society, to write technical reports and to present confidently by Campus Recruitment Training course and enriching communication skills

### **PO3 Critical thinking:**

Design solutions for complex problems by applying the knowledge gained from the updated curriculum with specialized courses like Python programming, Cryptography, Ethical Hacking and Cyber Forensics .,etc and Value Added Courses on recent technologies like Artificial Intelligence & Machine Learning(AI & ML) , Security Fundamentals etc

### **PO4 Problem solving:**

Analyze the problems by the insight gained from the projects done and Internship Training undergone during graduation for providing an optimal solution.

### **PO5 Analytical reasoning:**

Apply the knowledge of Mathematics while analyzing the given problem and crack that problem by applying software knowledge gained during graduation.

### **PO6 Research-related skills:**

Apply the knowledge of research skill in project development.

### **PO7 Cooperation/Team work:**

Develop them-selves to work with the team and maintain good relationship with the team members by involving in team projects.

**PO8 Scientific reasoning:**

Examine the complex problems by the knowledge gained from the recent technologies like Penetration Testing, Cyber Forensics, Artificial Intelligence, Machine Learning, Data Science and to solve them through that software tools

**PO9 Reflective thinking:**

Evaluate them-selves and sharpen their skills not only in conceptual way but also in practical way by implementing solutions for real time problems.

**PO10 Information/digital literacy:**

Apply the Information Security knowledge to protect their digital data through the knowledge gained by digital literacy.

**PO11 Self-directed learning:**

Adapt to learn new software technologies through the self-paced learning practice gained by doing project work and Internship training.

**PO12 Multicultural competence:**

Adapt to learn/work with multicultural people in a team to provide solution.

**PO13 Moral and ethical awareness/reasoning:**

Understand and inculcate the social values, ethics, responsibilities which have to be reflected in one's behavior.

**PO14 Leadership readiness/qualities:**

Manage a team of people through the leadership skills gained from group tasks.

**PO15 Lifelong learning:**

Acquire strong knowledge to learn new upcoming tools and to engage themselves in an independent way in the context of technological change.

## **Programme Specific Outcomes (PSO)**

The Programme Specific Outcomes of the B.Sc. Computer Science (Security System Specialization) Programme are to make the graduates to

PSO1: Expertise in Cyber Security Domain.

PSO2: Become security professional in Database Domain.

PSO3: Proficient in solving complex problems in Software Domain.

PSO4: Be highly skilled in developing Web Applications.

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## COURSE OUTCOMES

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
<b>22UT101 -</b> பொதுத்தமிழ்- I	CO 1: மரபுக்கவிதைகளின்வாயிலாகஎளியசொற்பதங்களைப்பயன்படுத்திவாழ்வியல்நிகழ்வுகளைஅறியச்செய்தல். CO 2: இக்காலகவிதைகளின்வாயிலாகஎளியசொற்பதங்களைப்பயன்படுத்திவாழ்வியல்நிகழ்வுகளைஅறியச்செய்தல். CO 3: சிறுகதைகளின்வாயிலாகசமூகம்சார்ந்தசிந்தனைகள்வலியுறுத்துதல். CO 4: மொழிப்பிழைகளைக்கண்டறிந்துநீக்கும்வழிமுறைகளைச்சான்றுடன்பயிற்றுவித்தல். CO1: படைப்பிலக்கியசிந்தனையையும், கற்பனைஆற்றலையும்வளர்த்தல்.
<b>22UH101 - Hindi I</b>	CO 5: Illustrate the proper usage of Hindi in writing and speaking. CO 6: Recognize the language through some short stories. CO 7: Apply the basics of grammar for effective communication. CO 8: Improve the skill of reading and understanding passages. CO 9: Enhance and enrich the vocabulary of the students.
<b>22UF101 - French Language, Culture and Civilisation– I</b>	CO1: Use basic words and express themselves in French. CO2: Acquire a good knowledge of the French Culture & Civilization. CO3: Acquainted with a basic knowledge of French Grammar. CO4: Apply the language skills for personal communication CO5: Describe persons and their characters, and also excel in telephonic conversation.

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
<b>22UCE102 - Communicative English I</b>	CO1: Develop the basics knowledge of grammar for effective communication. CO2: Enhance the purposeful reading and inculcate the ability of using e-resources CO3: Enable the writing ability through reading by learning of verbs & infinitives. CO4: Imbibe the skills of narrative writing through the learning of Tenses. CO5: Absorb skills in writing and understanding maps, graphs and pie charts and presenting through Voices.
<b>22CS103 - Programming in C</b>	CO 1: Interpret the basic programming structure using C CO 2: Solve the real time problems using single & multidimensional arrays CO 3: Apply structure in functions CO 4: Distinguish the difference between pointers and arrays CO 5: Build programs using random access concepts in files
<b>22CS104 - Digital Principles &amp; Computer Organization</b>	CO 1: Compare different classification of logic gates & components of a computer system CO 2: Propose the different types of number systems CO 3: Demonstrate I/O devices and its functionalities CO 4: Apply the concepts of different types of memory system in solving problems CO 5: Compute algorithms and illustrate processing unit
<b>22MF105 - Mathematical Foundation</b>	CO 1 : Apply the concepts of Relations and Recurrence Relations. CO 2 : Understand the concepts in Functions and Mathematical induction.

<b>Course Code and Course Name</b>	<b>Course Outcomes</b> <b>At the end of this course the students will be able to</b>
	CO 3 :Apply the concepts of Logic. CO 4 :Apply the concepts of matrices. CO 5 :Apply the concepts of Coding Theory.
<b>22CS106 P - Programming in C Lab</b>	CO 1:Distinguish between input and output statements in C CO 2:Utilize the Conditional statements by solving problems CO 3:Estimate the importance of functions in C CO 4:Solve problems using structures in C CO 5:Build applications using pointers and files in C
<b>22VE109 - Value Education</b>	CO 1: Inculcate significance of value education CO 2: Infer value education for nation building CO 3: Understand human rights with Indian constitution
<b>22 PE110 - Physical Education</b>	CO1: Participate and learn about the athlete through appropriate activities. CO2: Develop and reinforce cooperative behaviour. CO3: Teach the students to establish lifelong fitness goals. CO4: Enhance their skill about the games activities. CO5: Learn about the traditional games activities along with the concepts and benefits.
<b>22UH201 - Hindi II</b>	CO 1: Familiarize with the various elements/aspects of prose. CO 2: Enhance and develop the confidence level, ethics and some moral values. CO 3: Apply the basics of grammar for effective communication. CO 4: Inculcate respect and pride towards our nation. CO 5: Improve the skill of letter writing.
<b>22UF201 - French Language culture</b>	CO1: Express themselves in their basic words in French.



Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
<b>and Civilization-II</b>	CO2:Acquire a good knowledge of the French culture & Civilization. CO3: Identify the basic knowledge of French Grammar. CO4: Apply the language skills on the range of asking the personal information's and answer politely. CO5:Describe a person and character, telephone conversation.
<b>22UCE202 - Communicative English II</b>	CO1: Develop the basics knowledge of grammar for effective communication. CO2: Actively involves in the purposeful reading of books, poems and inculcate the ability of public speech. CO3: Draft e-mails, TED talks and preparing professional PPTs. CO4: Imbibe the skills of listening and attend meetings by sharing information and learning of types of sentences. CO5: Absorb skills in writing letters and learn the pattern of clauses to represent social issues.
<b>22CS203 - Object Oriented Programming with C++</b>	CO 1:Comprehend the OOPs concepts like polymorphism, abstraction, encapsulation and inheritance in C++ Programming CO 2:Determine the real time implementation of classes, methods and memory allocation for objects. CO 3:Build the Constructors, Destructors for memory allocation and de-allocation through polymorphism CO 4:Interpret the importance of Inheritance to enhance the reusability, Pointers and Virtual functions CO 5:Manage the I/O operations using files and to handle run time errors
<b>22CS204 - Operating</b>	CO 1: Analyze the basic operations and structure of

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
<b>System</b>	Operating System CO 2: Interpret Process Management using Scheduling Algorithms CO 3: Relate Process coordination with synchronization and deadlocks CO 4: Determine the process of Memory Management CO 5: Compare the various Scheduling Algorithms
<b>22CS205 P - Object Oriented Programming with C++ Lab</b>	CO 1: Examine the fundamentals of C++ programming CO 2: Interpret the fundamentals of object-oriented programming in C++, including Static variables, Static functions and Overloading. CO 3: Analyze the importance of inheritance and its types CO 4: Build the concepts of pointers and virtual functions CO 5: Design the real time implementation of Files
<b>22OR206 - Operations Research</b>	CO 1: Apply the concepts related to linear programming problem. CO 2: Apply the learning on Transportation problem CO 3: Apply the concepts related to Assignment problem. CO 4: Apply the learning on Network Analysis. CO 5: Apply the concepts related to Game Theory.
<b>22CS207 P - Linux Lab</b>	CO 1: Apply file manipulation commands CO 2: Demonstrate utility commands CO 3: Analyze pipes and filter commands CO 4: Interpret process commands CO 5: Inspect shell scripts for various applications
<b>22CS208 - Introduction to Computer Networks</b>	CO 1: Analyze the Physical Layer functionalities CO 2: Determine the Protocols properties available in DLL CO 3: Inspect the IP protocol functionality and

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	routing algorithms in Network layer CO 4: Analyze the TCP and UDP datagram protocols CO 5: Evaluate the benefits of Application Layer protocols
<b>22ES210 - Environmental Studies</b>	CO 1: Comprehend the significances of Multidisciplinary nature of environmental studies CO 2: Recognize ecological succession CO 3: Employ Natural resources in terms of alternative energy sources to meet our growing energy needs. CO 4: Relate Ecosystem in terms of Biodiversity CO 5: Control Environmental pollution CO 6: Interpret Environmental Policies and Practices. CO 7: Relate Human community with the environment and safeguard the species
<b>21UH301 - Hindi III</b>	CO1: Apprise the role of one act plays in literature. CO2: Emphasize the values in the minds of students through ethical poetry. CO3: Acquaint grammar for effective communication. CO4: Apply the language in our daily life activities. CO5: Develop the ability in creativity in writing.
<b>21UCE302 - Communicative English III</b>	CO 1: Appraise themselves by knowing the SWOC, learn the barriers in writing and probing questions through tags. CO 2: Develop purposeful writing formal letters and essays with correct contents and also learn to use the Articles in the right places. CO 3: Imbibe the basics of body language, enhancing the vocabulary through the one word substitutions and also learning the grammar degrees of comparisons..

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	<p>CO 4: Enhance vocabulary by learning Synonyms, Antonyms, performing ceremonial speech for various events and also drafting e-mail and its etiquettes.</p> <p>CO 5: Facilitate the differentiation between homophones &amp; homonyms, enabling reading activity by comprehending the passage and enhance the skills of using idioms and phrases in their regular communication.</p>
<b>21CS303 - Cryptography</b>	<p>CO 1: Explain the Security Mechanisms and Security Services.</p> <p>CO 2: Understand the working principles of Block Ciphers through Data Encryption Standard.</p> <p>CO 3: Build different security features using the algorithms and techniques.</p> <p>CO 4: Interpret the importance of Public key Cryptography.</p> <p>CO 5: Make use of different authentication functions to handle real time scenarios</p>
<b>21CS304 - Data Structures</b>	<p>CO 1: Analyze the abstract properties of various data structures.</p> <p>CO 2: Demonstrate the various operations on Stacks and Queues.</p> <p>CO 3: Design the implementation of Linked Lists with its operations.</p> <p>CO 4: Discuss the functionalities of Tree structure and its applications.</p> <p>CO 5: Determine the different techniques of Sorting and Searching.</p>
<b>21SM305 - Statistical Methods</b>	<p><b>CO1:</b> understand Quantitative and Qualitative data</p> <p><b>CO2:</b> present the data using curves/graphics</p> <p><b>CO3:</b> understand different measures of dispersion</p> <p><b>CO4:</b> understand correlation with diagrammatic representation</p> <p><b>CO5:</b> Acquire the knowledge to use the regression analysis</p>

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<b>21CS306 P - Network Security Lab using Java</b>	CO 1: Illustrate class, method & constructor in Java CO 2: Examine the conditional statements by solving problems CO 3: Estimate the importance of inheritance in Java CO 4: Build user interface using Applet class CO 5: Experiment with network security concepts
<b>21CS307 - Java Programming</b>	CO 1: Demonstrate the basic concepts in Java Programming CO 2: Interpret the real time implementation of classes and methods CO 3: Build the concept of inheritance, interfaces and packages CO 4: Determine the importance of Multithreading and Exception handling CO 5: Develop an interactive interface using java I/O streams and applets
<b>21CS308 P - Python Programming Lab</b>	CO 1: Improve the basic concepts like operators, control structures, etc in Python. CO 2: Develop the knowledge in defining functions. CO 3: Compute the object oriented concepts in Python. CO 4: Formulate the GUI Programming using Python. CO 5: Integrate the concept of MYSQL with Python.
<b>21CS309 P - MS Office Lab-I</b>	CO 1: Identify and apply the menus in MS-Word CO 2: Utilize the basic knowledge about the menus in Excel CO 3: Learn more about design, formula usages CO 4: Improve their preparation of Newspaper documents and Result analysis in worksheet CO 5: Integrate the usage of Ms Word and Ms Excel

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
<b>21CS310 P - Web Designing Lab –I</b>	CO 1: Understand the basics of HTML CO 2: Develop HTML pages with the help of frames, scripting languages CO 3: Improve to work with Style sheet like CSS CO 4: Design a webpage using HTML CO 5: Integrate to design web page and web site
<b>21UH401 - Hindi – IV</b>	CO 1: Interpret the history of Hindi Literature. CO 2: Inculcate the ethics to be followed in life. CO 3: Apply the language in our daily life activities. CO 4: Design some sentences on general topics in Hindi. CO 5: Recall simple translation.
<b>21UCE402 - Communicative English IV</b>	CO 1: Involve actively in participative learning of English and to enable them to acquire note making skills and affixes. CO 2: Use the various styles of writing to meet the basic requirements of business, understanding the connotation of Report Writing and enabling reading skills through reading comprehensions CO 3: Inculcate the skill of power point presentation and enhance the skill of report writing through the learning of direct & indirect speech. CO 4: Enrich resume writing ability and enrich the communication skills through verbal analogies. CO 5: Enhance the precise writing and also recapping the tenses for facing the interview in a professional manner.
<b>21CS403 - Penetration Testing Fundamentals</b>	CO 1: Interpret the fundamentals of Ethical Hacking CO 2: Illustrate the concept of reconnaissance, Footprinting, Scanning and Enumeration CO 3: Experiment with System Hacking techniques and Malware Attacks CO 4: Analyze the Concepts of attacks such as Sniffing, Denial of Service, Session Hijacking, SQL Injection and Buffer Overflows

<b>Course Code and Course Name</b>	<b>Course Outcomes</b> <b>At the end of this course the students will be able to</b>
	CO 5: Analyze the importance of following Ethics of Ethical Hacking.
<b>21CS404 - Relational Database Management System</b>	CO 1: Demonstrate the basic concepts of Database Languages and Database Design CO 2: Illustrate the concept of ER Models and Normalization CO 3: Analyze the concept of Storage and file Structure CO 4: Determine the importance of Transaction Management & Concurrency Control CO 5: Interpret the Recovery System
<b>21CS405 P - Penetration Testing Lab</b>	CO 1: Analyze the practical implementation of Ethical Hacking Tools CO 2: Interpret the concept of Foot Printing and Reconnaissance CO 3: Apply the concept of Ping, ARP, and nslookup Commands CO 4: Analyze the concept of DOS/DDOS attack and ARP Poisoning CO 5: Interpret the concept of Password Cracking and Network traffic Analyzer
<b>21CS406 P - Database Security Lab</b>	CO 1: Interpret the results of SQL queries. CO 2: Develop queries & sub queries. CO 3: Apply the functions like date, time, math, and string functions. CO 4: Determine and manage the Backup concept. CO 5: Interpret the security features in the database.
<b>21CS407 P - Data Analytics Lab using Python</b>	CO 1: Analyze the practical implementation of data analytics CO 2: Interpret the concept of data analytics using python CO 3: Apply the concept of pandas and numpy CO 4: Analyze the concept of sorting and ranking the data CO 5: Interpret the concept of data visualization
<b>21CS408 P - MS Office Lab – II</b>	CO 1: Demonstrate the fundamentals of presentation software

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	CO 2: Utilize the basic knowledge about the data storage using MS Access. CO 3: Analyze the effective usage of Power Point Presentation CO 4: Experiment with the usage audio, video & hyperlinks in the slides CO 5: Create and store data in the table using Ms-Access
<b>21CS409 P - Web Designing Lab – II</b>	CO1: Understand the fundamentals of web designing CO2: Apply CSS for web designing CO3: Build dynamic web applications using scripts CO4: Experiment with objects in java script CO5: Interpret cookies
<b>20CS501 - Cyber Forensics</b>	CO1: Understand the concept of Digital Forensic Investigation CO2: Demonstrate data acquisition using data acquisition tools CO 3: Experiment with live acquisition and network forensics CO 4: Analyze about Forensic software and validation CO5: Determine the importance of report writing ethics
<b>20CS502 - Software Engineering</b>	CO 1: Understand the nature of the software and different types of process models CO 2: Gain knowledge about the requirements stage development of the software CO 3: Analyze the different types of architectural designs of the software CO 4: Evaluate different testing strategies of the software CO 5: Develop the software Tools
<b>20CS503 - Cloud Computing &amp; Security Approaches</b>	CO 1: Interpret the concept of cloud computing. CO 2: Examine the evolution of cloud from



Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	<p>the existing technologies.</p> <p>CO 3: Analyze various issues in cloud computing.</p> <p>CO 4: Determine the lead players in cloud.</p> <p>CO 5: Analyze the emergence of cloud as the next generation computing paradigm</p>
<b>20CS504 - Data Mining &amp;Data Warehousing</b>	<p><b>CO1:</b> Interpret the basic concepts and techniques of Data Mining</p> <p><b>CO2:</b> Determine the data mining architecture</p> <p><b>CO3:</b> Analyze association rule mining</p> <p><b>CO4:</b> Examine data classification techniques</p> <p><b>CO5:</b> Analyze data clustering techniques</p>
<b>20CS508P - Cyber Forensics Lab</b>	<p>CO 1:Analyze the practical implementation of Cyber Forensics</p> <p>CO 2:Determine the need of data acquisition using tools</p> <p>CO 3:Estimate the use of windows registry and file system during investigation</p> <p>CO 4:Inspect the password strength using application password cracking</p> <p>CO 5:Develop Investigation on Mobile and Email crimes</p>
<b>20CS509 P - Open Source Technology Lab</b>	<p>CO 1: Illustrate the concepts like operators, control structures, etc in PHP</p> <p>CO 2: Develop their knowledge in defining functions</p> <p>CO 3: Create the Session, Cookies in PHP</p> <p>CO 4: Experiment with MYSQL and PHP</p> <p>CO 5: Create the ODBC connection using PHP</p>
<b>20PRT509 P - Placement Recruitment Training Practical</b>	<p>CO1: Encourage the students in participative learning of English and to enable them acquire communication skills.</p> <p>CO2: Enable the students prepare themselves as professionals, by understanding Life Skills.</p>

Course Code and Course Name	Course Outcomes At the end of this course the students will be able to
	<p>CO3:Comprehend what a Personal Interview is and to familiarize them with the P.I. process through simulation.</p> <p>CO4: Understand what GD is and to familiarize them with the different types ofGDs `through practice.</p> <p>CO5: Equip the students to enhance General Knowledge to equip them in all the aspects.</p>
<p><b>20CS601 P / 20CS602 P - Internship / Project</b></p>	<p>CO1: Acquire Strong knowledge through real time projects.</p> <p>CO2: Develop software Solutions or to provide Cyber Security Solution.</p> <p>CO3: Meet the carrier needs of the IT industry.</p> <p>CO4: Acquire knowledge through Project or Internship Training</p> <p>CO5: Get carrier opportunities in software &amp; cyber security domain for their bright future.</p>