PSGR
Krishnammal College for Women

DEPARTMENT OF COMPUTER SCIENCE WITH CYBER SECURITY

CHOICE BASED CREDIT SYSTEM (CBCS)
&
LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (LOCF)

B.Sc. COMPUTER SCIENCE WITH CYBER SECURITY

2025-2028 BATCH

PROGRAMME LEARNING OUTCOMES (PLO's)

After Completion of the programme, the student will be able to

PLO1: Design, implement, and evaluate a computer network and information security needs of an organization.

PLO2: Analyze and evaluate the cyber security needs of an organization and society.

PLO3: Explore Current and emerging techniques and technologies to formulate solutions for systems and organizations.

PLO4: Pursue higher studies in the specialized area and also promote life-long learning for professional development.

PLO5: Recognize as world class professionals in IT and in cybercrime and produce women entrepreneurs to increase more employability.

PROGRAMME SPECIFIC OUTCOMES (PSO's)

The students at the time of graduation will

PSO1: Professionally be equipped in the areas of cyber security tools and cyber/computer forensics software/tools.

PSO2: Apply the knowledge of technology and characterize privacy, legal and ethical issues of information security.

PSO3: Analyze modern cyber security tools and applications for their successful career, to create platforms to become an entrepreneur and a relish for higher studies

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PSGR Krishnammal College for Women

B.Sc. Computer Science with Cyber Security
Choice Based Credit System (CBCS)
Learning Outcomes Based Curriculum Framework (LOCF)
Syllabus & Scheme of Examination
2025-2028 Batch
Semester I

Semester	Part	Course Code	Title of the Course	Course Type	Instruction Hours / Week	Contact Hours	Tutorial Hours	Duration of Examination	Examination Marks			Credits
									CA	ESE	Total	
I	I	TAM2501A/ HIN2501A/ FRE2501A	Tamil Paper I / Hindi Paper I/ French Paper I	L	4	58	2	3	25	75	100	3
I	II	ENG2501A	English Paper I	E	4	58	2	3	25	75	100	3
I	III	CY25C01	Programming in C	CC	4	58	2	3	25	75	100	3
I	III	PP22C02	Computational and Algorithmic Thinking for Problem Solving	CC	3	45	-	-	100	-	100	3
I	III	CY24C03	IT Fundamentals for Cyber Security	CC	4	58	2	3	25	75	100	3
I	III	TH24A03	Numerical and Statistical Techniques	GE	6	88	2	3	25	75	100	5
I	III	CY24CP1	C Programming and Cyber Security Tools Lab	CC	3	45	-	3	15*	35*	50	2
I	IV	NME25B1 / NME25A1	Basic Tamil I / Advanced Tamil I	AEC	2	28	2	-	100	-	100	2
I	IV	NME23ES	Introduction to Entrepreneurship	AEC	2	30	-	-	100	-	100	
I-II	VI	NM25GAW	General Awareness	AECC	SS	-	-	-	100	-	100	Gr.

I-II	VI	COM25SER	Community Services 30 Hours	GC	-	-	-	-	-	-	-	-
I -V	VI	24BONL1 24BONL2 24BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-	-	-

Semester	Part	Course Code	Title of Course	Course Type	Instruction Hours / Week	Contact Hours	Tutorial Hours	Duration of Examination	Examination Marks			Credits
									CA	ESE	Total	
II	I	TAM2502A/ HIN2502A/ FRE2502A	Tamil Paper II/ Hindi Paper II/ French Paper II	L	4	58	2	3	25	75	100	3
II	II	ENG2502A	English Paper II	E	4	58	2	3	25	75	100	3
II	III	IN24C04	Python Programming	CC	5	73	2	3	25	75	100	3
II	III	CY24C05	Operating systems and Security	CC	4	58	2	3	25	75	100	3
II	III	CY24CP2	Python Programming and OS Security Lab	CC	5	75	-	3	15#	35#	50#	3
II	III	TH24A12	Number Theory and Algebra	GE	6	88	2	3	25	75	100	5
II	IV	NM25UHR	Universal Human Values and Human Rights	AECC	2	30	-	-	100	-	100	2
II	IV	NME25B2 / NME25A2	Basic Tamil II / Advanced Tamil II	AEC	-	-	-	-	100	-	100	Gr
II	VI	NM25GAW	General Awareness	AECC	SS	-	-	-	100	-	100	Gr
I-II	VI	COM25SER	Community Services - 30 Hrs	GC	-	-	-	-	-	-	-	-
I -V	VI	24BONL1 24BONL2 24BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-	-	-

*CA conducted for 25 and converted into15, ESE conducted for75 and converted in to 35

CC: Core Courses
GE: Generic Elective

CA: Continuous Assessment
ESE: End

Semester Examination

SS: Self Study

AEC: Ability Enhancement Course

AECC: Ability Enhancement Compulsory Course

ACC: Additional Credit Course

GC: Gene Course

Evaluation Pattern 25-28 Batch onwards

CA Question Paper Pattern and distribution of marks

UG Language and English

Section A	5 x 1 (No choice)	:	5 Marks
Section B	4 x 5 (4 out of 6)	:	20 Marks (250 words)
Section C	2 x 10 (2 out of 3)	:	20 Marks (500 words)
	Total	**:**	**45 Marks**

UG & PG- Core and Allied - (First 3 Units)

CA Question from each unit comprising of

One question with a weightage of 2 Marks :2 x 3 = 6

One question with a weightage of 5 Marks (Internal Choice at the same CLO level) :5 x 3 =15

One question with a weightage of 8 Marks (Internal Choice at the same CLO level) :8 x 3 =24

Total :45

Marks End Semester Examination – Question Paper Pattern and Distribution of Marks

Language and English – UG

Section A	10 x 1 (10 out of 12)	:	10 Marks
Section B	5 x 5 (5 out of 7)	:	25 Marks (250 words)
Section A	4 x 10 (4 out of 6)	:	40 Marks (600 - 700 words)
	Total	**:**	**75 Marks**

UG & PG - Core and Allied courses:

ESE Question Paper Pattern: 5 x 15 = 75 Marks

Question from each unit comprising of

One question with a weightage of 2 Marks : 2 x 5=10

One question with a weightage of 5 Marks (Internal Choice at the same CLO level): 5 x 5 =25

One question with a weightage of 8 Marks (Internal Choice at the same CLO level): 8 x 5 =40

Continuous Internal Assessment

Pattern Theory

I Year UG / PG

CIA Test	:	5 marks **(conducted for 45 marks after 50 days)**
Model Exam	:	7 marks **(Conducted for 75 marks after 85 days (Each Unit 15 Marks))**
Seminar/Assignment/Quiz	:	5 marks
Class Participation	:	5 marks
Attendance	:	3 marks

Total : 25 Marks

Practical

Lab Performance	:	7 marks
Regularity	:	5 marks
Model Exam	:	10 marks
Attendance	:	3 marks
Total	**:**	**25 marks**

ESE Practical Pattern

The End Semester Examination will be conducted for a maximum of 75 marks respectively with a maximum 15 marks for the record and other submissions if any.

Part IV

Introduction to Entrepreneurship

Quiz	:	50 marks
Assignment	:	25marks
Project / Case study	:	25 marks
Total	**:**	**100 Marks**

COURSE	PROGRAMME OUTCOMES				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
CY25C01					
CLOs	**PLO1**	**PLO2**	**PLO3**	**PLO4**	**PLO5**
CLO1	S	S	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S
PP22C02					
CLO1	M	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S
CY24C03					
CLO1	S	M	S	S	M
CLO2	S	S	S	S	M
CLO3	S	M	M	S	S
CLO4	S	M	S	S	S
CY24CP1					
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	S	S	M
CLO4	S	S	M	S	S

IN24C04

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	M	S
CLO2	S	S	M	S	M
CLO3	M	S	S	S	S
CLO4	S	M	S	S	S

CY24C05

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	S	M	S

CY24CP2

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	S	S	M
CLO4	S	S	M	S	S

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CY25C01	PROGRAMMING IN C	THEORY	58	2	-	3

Preamble

This course introduces fundamental programming constructs in C. It covers the concepts such as arrays, functions, structures, pointers and file handling. It provides comprehensive coverage on industry 4.0.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the programming constructs and structure of C programming and Industry 4.0 technologies	K1
CLO2	Understand the purpose of arrays, strings, structures, pointers and files to solve problems	K2
CLO3	Apply functions to solve problems using procedure-oriented approach	K3
CLO4	Analyze the problems and solve it by applying appropriate logic	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium

PROGRAMMING IN C – CY25C01 58 Hrs.

Syllabus

Unit I **12 Hrs**

Overview of C - Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations -**Sulba Sutras**-**Decision Making and Branching - Decision Making and Looping**.

Unit II **12 Hrs**

Shloka Arrays: One-Dimensional - Two Dimensional - Multidimensional Arrays-Character Arrays and Strings: Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - String Handling Functions**.**

Unit III **12 Hrs**

Chandas -User-Defined Functions: Need - Return Values and Types - Function Calls - Function

declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Arguments with Return Values - Recursion - Scope Visibility and Life time of Variables **Structures and Unions** - Definition: Structure Initialization - Comparison of Structure Variables - Arrays of Structures - Arrays within Structures - Unions.

Unit IV **12 Hrs**

Pointers: Understanding Pointers - Accessing the Address of a Variable - Declaring and Initializing Pointers - Accessing a Variable through its Pointers - **Pointers and Arrays**. File Management in C: Defining and Opening a File - Closing File - **I/O Operations on Files** - Dynamic Memory allocation MALLOC, CALLOC, REALLOC.

Unit V **10 Hrs**

Introduction to Industry 4.0 - Need - Reasons for Adopting Industry 4.0 - Definition - Goals and Design Principles - **Technologies of Industry 4.0** - Skills required for Industry 4.0 - Advancements in Industry - **Impact of Industry 4.0 on Society, Business, Government and People - Introduction to 5.0.**

Text Book

S. No	Author	Title of the Book	Publisher	Year and Edition
1	E.Balagurusamy	Programming In ANSI C	Tata Mc Graw Hill	2019, 8th Edn
2	P. Kaliraj, T. Devi	Higher Education for Industry 4.0 and Transformation toEducation 5.0	CRC Press - Taylor & Francis Group	2021, 1st Edn

Reference Books

S. No	Author	Title of the Book	Publisher	Year and Edition
1	Byron Gottfried	Programming with C	Tata McGraw Hill	2018, 4th Edn
2	Yashwvant Kanetkar	Let Us C: Authentic Guide To C Programming Language	BPB Publications	2020, 17th Edn

Pedagogy

- Lectures, Group discussions, Demonstrations

Course Designer

Dr. Sabitha Banu A

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
PP22C02	COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING	THEORY	45	-	-	3

Preamble

- *This course aims to kindle the young minds to think like a computer scientist, with the idea that Computing and computers will enable the spread of computational thinking.*
- *Computational thinking is thinking recursively, reformulating a seemingly difficult problem into one which we know how to solve and taking an approach to solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science*

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Define the basic principles of logical reasoning, problem solving in computational thinking	K1
CLO2	Understanding the applications of propositional logic, problem representation and techniques	K2
CLO3	Apply algorithmic thinking to problem solving using tools	K3
CLO4	Apply and analyze to solve domain specific problems using computational thinking concepts	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S

S - Strong; M - Medium

COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING- PP22C02

Syllabus **45 Hrs.**

Unit I **7 Hrs**

Basics: Introduction to Computational Thinking- Data Logic - History of Computational Thinking- Applications of Computational Thinking.

Unit II **8 Hrs**

Data- Information and Data - Data Encoding - Logic - Boolean logic - Applications of simple Propositional Logic. Tool: Flowgorithm and Scratch.

Unit III **10 Hrs**

Problem Solving and Algorithmic Thinking: Problem definition- Logical reasoning- Problem decomposition- Abstraction- Problem representation via Algorithmic thinking: Name binding- Selection- Repetition and Control Abstraction- Simple Algorithms – Comparison of performance of Algorithms

Unit IV **8 Hrs**

Activities in Class: Sudoku-Towers of Hanoi- Graph Coloring-Geographical Map reading- Poem reading-Novel reading- Data analysis on news.

Unit V **12 Hrs**

Problem Solving Techniques- Factoring and Recursion Techniques- Greedy Techniques-Divide and Conquer- Search and Sort Algorithms- Text Processing and Pattern matching. Tool: iPython.

Text Book

S. No	Author	Title of the Book	Publisher	Year and Edition
1	David Riley and Kenny Hunt	Computational Thinking for Modern Solver	Chapman & Hall/CRC	2014, 1st Edn
2	Paolo Ferragina, Fabrizio Luccio	Computational Thinking First Algorithms	Springer	2018, 1st Edn
3	Karl Beecher	Computational Thinking – A beginner's guide to problem solving	BSC publication	2017, 1st Edn

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Evaluation Pattern

Assessment	Number	Marks
Quiz (online or offline)	5	50
Class Activity	5	25
Group Project (Domain Specific)	1	25
Total		100

Course Designer

Mrs. P. Yashodha

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CY24C03	IT FUNDAMENTALS FOR CYBER SECURITY	THEORY	58	2	-	3

Preamble

This course provides the fundamentals of computers and understanding the key issues associated with protecting information assets. The purpose of the course is to provide an overview of the field of cyber security, cybercrime and information assurance.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the concepts of cyber security and Information Security	K1
CLO2	Understand the concepts of cyber security threats, importance and challenges in Cyber Security.	K2
CLO3	Develop the applications by cyber security tools.	K3
CLO4	Analyze & implement the real- time applications by Cyber Security tools.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	S	S	M
CLO3	S	M	M	S	S
CLO4	S	M	S	S	S

S- Strong; M-Medium

IT FUNDAMENTALS FOR CYBER SECURITY – CY24C03

Syllabus **58 Hrs.**

Unit I **12 Hrs**

Introduction: Generations of Computer, **Types of Computer -** Functional units of a computer system- **Input Devices -Output devices – Memory – Storage Devices**. Number Systems: Decimal, Binary, Octal and Hexadecimal – Conversion –Computer Codes- Binary Addition, Subtraction- Complements.

Unit II **12 Hrs**

Information security: History of IS-What is security -**characteristic of IS**-components of an Information system –**Security System Development Life Cycle model**. – Information Security for technical Administrators: server security- network security

Unit III **12 Hrs**

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Challenges and Constraints, Computer Criminals -Assets and **Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Spectrum of attacks- CIA Triad** -Taxonomy of various attacks, IP spoofing-**Types of Threats**

Unit IV **12 Hrs**

Cyber Security Tools - Kali Linux – Nmap – Wireshark – Metasploit – Burpsuite **- Sql Injection- Password Cracking Tool**.

Unit V **10 Hrs**

Cybercrime: **Definition and Origin of the World**-Cybercrime and Information Security- Cyber Criminals –Classification of Cybercrimes- Methods of defense, Security Models, risk management, Cyber Threats- **Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage**.

Text Books

S. No	Author	Title of the Book	Publishers	Year and Edition
1	P K Sinha&PritiSinha	Computer Fundamentals	BPB Publications	2017, 6th Edn
2	Donaldson, S., Siegel, S., Williams, C.K., Aslam, A	Enterprise Cyber security -How to Build a Successful Cyber defense Program against Advanced Threats	A Press	2015, 1st Edn
3	Nina Godbole, Sumit Belapure	Cyber Security: Understanding Cyber Crimes,Computer Forensics and Legal Perspectives,	Willey	2011, 1st Edn

. **Reference Books**

S.No	Author	Title of the Book	Publishers	Year and Edition
1	Devan N. Shah	Information Security Principles and Practice	Wiley India	2009, 1st Edn
2	George K. Kostopoulous	Cyber Space and Cyber Security	CRC Press	2013, 1st Edn

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Dr. R. Divya

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CY24CP1	C PROGRAMMING AND CYBER SECURITY TOOLS LAB	PRACTICAL	-	-	45	2

Preamble

- *The course gives hands-on experience on C Programming and improves the practical skill set. The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of C code. The course involved in compiling, linking and debugging C code and developing some complex programs. The course gives hands-on experience on Cyber Security tools.*

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Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Outline the logic using flowchart for a given problem and develop Programs using conditional and looping statements.	K1
CLO2	Develop programs with cyber security tools and concepts of arrays, functions, string handling functions and parameter passing techniques.	K2
CLO3	Construct programs with features of Structure and Pointers.	K3
CLO4	Develop readable programs with files for reading input and storing the output with perform operations.	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	S	S	M
CLO4	S	S	M	S	S

S- Strong; M-Medium

C PROGRAMMING AND CYBER SECURITY TOOLS LAB- CY24CP1 45 Hrs.

Programs List

- Exercise in basics Operations Statement.
- Exercise in Control Structures.
- Exercise in arrays.
- Exercise in String handling functions.

- Exercise in User defined functions
- Exercise in Structure.
- Exercise in Pointers.
- Set up Kali Linux in a virtual machine and set up a network Adapter.
- Scan the network for Kali Linux and Windows target machines in local network and virtual network.
- Identify the open ports using NMAP.
- Sniffing using Wireshark Tool.

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designer

Dr. R. Divya

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN24C04	PYTHON PROGRAMMING	THEORY	73	2	-	3

Preamble

The course covers basic knowledge of Python Programming. It defines the Conditional Statements & Loops, Functions, Tuples, Python data structures and Exception & its tools.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the technical strengths, Python Interpreter and the program execution	K1
CLO2	Understand the purpose of operations, strings, lists, tuples to solve problems	K2
CLO3	Apply concepts from IKS to solve problems using procedure-oriented approach	K3
CLO4	Analyze the problems and solve it by applying appropriate logic	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	M	S
CLO2	S	S	M	S	M
CLO3	M	S	S	S	S
CLO4	S	M	S	S	S

S- Strong; M-Medium

Python Programming - IN24C04 **73 Hrs**

Syllabus

UNIT I **(14 Hrs)**

Introduction: Why do people use python- Python a scripting language- Users of Python- Need of Python- Python's Technical Strengths- How Python runs programs: Introducing the Python Interpreter- Program Execution-Execution Model Variation: Python Implementation Alternatives.

UNIT II **(15 Hrs)**

Types & Operations: Numbers Types: Numeric type basics, Numbers in action, Other numeric Types- Strings Fundamentals: String Basics, String Literals, Strings in action, String Methods – Lists – Panini's Ashtadhyayi, Anitya - Dictionaries-Tuples and Immutable Truths-Sutras-Files.

UNIT III **(15 Hrs)**

Control Flow: Statements& Syntax: Assignment-Expressions & Print- if tests-While& for loops**.** Functions: Function Basics: Why use functions- Coding Functions- Definition & Calls. Scopes: Python Basics - Global Statement-Scopes Nested functions -Arguments: Arguments passing Basics- Special Arguments Matching Modes.

UNIT IV **(14 Hrs)**

Files and Exception handling**:** Files -Text Files, File Objects, File Built-in Methods, File Built-in Attributes, Standard Files, Reading and writing, Format operator, Filenames and Paths, Pipes. Exceptions: Built-in Exceptions, Handling Exceptions, Exception with Arguments- Nyaya Logic- User-Defined Exceptions.

UNIT V **(15 Hrs)**

Modules and Packages: Modules - Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions. Python packages- Simple programs using the built-in functions of packages matplotlib, numpy, pandas. GUI Programming - Tkinter introduction, Buttons and callbacks, Canvas widgets, Coordinate sequences, Tk Widgets, Menus and Callables.

Text Books

S. No	Author	Title of the Book	Publisher	Year and Edition
1	Mark Lutz	Learning python(Unit I-III)	O'Reilly Publication	2013, 5th Edn
2	Allen B. Downey	Think Python: How to Think like a Computer Scientist(Unit IV-V)	O'Reilly Publishers,	2016 , 2nd Edn
3	Kapil Kapoor	Indian Knowledge System	Indian Institute of Advanced Study	2005, 1st Edn

Reference Books

S.No	Authors	Title	Publishers	Year and Edition
1	E. Balagurusamy	Problem Solving and Python Programming	McGraw-Hill	2017, 1st Edn
2	Guido van Rossum and Fred L. Drake Jr	An Introduction to Python – Revised and updated for Python 3.2	Python Software Foundation, Network Theory Ltd	2011, 1st Edn
3	Wesley J Chun	Core Python Applications Programming	Prentice Hall	2012, 3rd Edn

Pedagogy

- Chalk and Talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CY24C05	OPERATING SYSTEMS AND SECURITY	THEORY	58	2	-	3

Preamble

To provide a discussion of the fundamentals of operating system design and to relate these to contemporary design issues and to current directions in the development of operating systems Security.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall about the basic concepts of operating system and its Security	K1
CLO2	Understand the operating systems objectives and functionality along with system programs and system calls	K2
CLO3	Applying various concepts and algorithms for scheduling, partitioning, storage management concepts and Security Concepts.	K3
CLO4	Analyze the operating system Storage, Deadlock, File System and Security	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	S	M	S

S- Strong; M-Medium

Operating Systems and Security – CY24C05 58 Hrs

UNIT I (11 Hrs)

Introduction and process concepts: Definition of OS - Definition of process - Process States - Process State Transition - Semaphores - Deadlock and Indefinite postponement**.**

UNIT II (11 Hrs)

Storage management: Real storage: Real storage management strategies - Contiguous Vs non- contiguous storage allocation - Single user contiguous storage allocatio**n** - Fixed partition multiprogramming - Variable partition multiprogramming**.** Virtual storage: Virtual storage management strategies**:** Page replacement strategies - working sets - Demand paging.

UNIT III (12 Hrs)

Processor management**:** Introduction - Job and processor scheduling: Preemptive Vs Non- preemptive

scheduling – priorities - Deadline scheduling - FIFO-RR - SJF-SRT. Distributed computing–Pipelining – Vector processing. Multiprocessing - Fault Tolerance.

UNIT IV **(12 Hrs)**

Device and information management: Disk performance optimization: Operation of moving head disk storage - Need for disk scheduling – FCFS - SSTF – SCAN. Optical Disks - file and database systems: File system – Access control by user Classes**.** Allocating and freeing space - file descriptor -Backup and Recovery.

UNIT V **(12 Hrs)**

Operating System Security: Introduction – Password Protection – Access Controls – Security Kernels – Fault – Tolerant System– Operating System - Unix Operating System Security – Worms and Viruses**.**

Text Book

S.No.	Authors	Title	Publishers	Year and Edition
1	Deitel H.M	An Introduction to Operating System	Addison Wesley Publishing Company	2005, 1st Edn

Reference Books

S.No.	Authors	Title	Publishers	Year and Edition
1	Andrew S.Tanenbaum, Albert S.Woodhull.	Operating Systems- Design and Implementation	Pearson Education	2011, 3rd Edn
2	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne	Operating System Concepts	John Wiley & Sons	2010, 8th Edn
3	Archer J Harries	Operating Systems	Tata McGraw Hill	2008, 1st Edn

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CY24CP2	PYTHON PROGRAMMING AND OS SECURITY LAB	PRACTICAL	-	-	75	3

Preamble

The course gives hands-on experience on Python Programming and improves the practical skill set. The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of Python code and the knowledge of operating system Process to implement the state of process and storage and processor management. The course involved in compiling, linking and debugging Python code and developing some complex programs

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the basic terminologies of Python programming such as data types, conditional statement, looping statements, functions and basic concepts of operating system	K1
CLO2	Develop programs with implementation of operators & I/O operations and operating systems functionality methods	K2
CLO3	Construct programs with features of Lists, Strings	K3
CLO4	Develop readable programs with files for Exception handling concepts.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	S	S	M
CLO4	S	S	M	S	S

S- Strong; M-Medium

Python Programming and OS Security Lab - CY24CP2 75 Hrs

Program List

- Operators & I/O operations.
- Lists.
- Strings.
- Functions.

- Dictionaries.
- Tuples.
- Files, Modules and Packages.
- Program to ping two Network Machine using TCP code