

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**



SILVER JUBILEE INSTITUTION

(Affiliated to Bharathidasan University)

(Accredited by NAAC | An ISO 9001:2015 Certified Institution)

SUNDARAKKOTTAI, MANNARGUDI – 614016, TAMILNADU, INDIA.

B.Sc., COMPUTER SCIENCE

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK(CBCS-LOCF)

(For the candidates admitted in the academic year 2024–2025)

PROGRAMME CODE

3USCSC



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**

(Affiliated to Bharathidasan University, Tiruchirappalli)
Accredited by NAAC-An ISO 9001:2015 Certified Institution
SUNDARAKKOTTAI, MANNARGUDI-614016.

TAMILNADU, INDIA.

B.Sc., COMPUTER SCIENCE
CHOICE BASED CREDIT SYSTEM– LEARNING OUTCOMES BASED
CURRICULUM FRAME WORK (CBCS–LOCF)
(For the candidates admitted in the academic year 2024–2025)

CHOICE BASED CREDIT SYSTEM

The credit-based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice-based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning. Our college has moved to CBCS and implemented the grading system.

OUTCOME-BASED EDUCATION (OBE)

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (LOCF)

The fundamental premise underlying the learning outcomes-based approach to curriculum planning and development is that higher education qualifications are awarded on the basis of demonstrated achievement of outcomes (expressed in terms of knowledge, understanding, skills, attitudes and values) and academic standards expected of graduates of a programme of study. Learning outcomes specify what graduates completing a particular programme of study are expected to know, understand and be able to do at the end of their programme of study. The expected learning outcomes are used as reference points that would help to formulate graduate attributes, qualification descriptors, programme learning outcomes and course learning outcomes which in turn will help in curriculum planning and development, and in the design, delivery and review of academic programmes. They provide general guidance for articulating the essential learnings associated with programmes of study and courses within a programme, maintain national standards and international comparability of learning outcomes and academic standards to ensure global competitiveness, and to facilitate student/graduate mobility and provide higher education institutions an important point of reference for designing teaching-learning strategies, assessing student learning levels, and periodic review of programmes and academic standards.

Some important aspects of the Outcome Based Education Course: is defined as a theory, practical or theory cum practical subject studied in a semester.

Course Outcomes (COs): are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally, three or more course outcomes may be specified for each course based on its weightage.

Programme: is defined as the specialization or discipline of a degree.

Programme Outcomes (POs): Programme outcomes are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes.

Programme Specific Outcomes (PSOs): PSOs are what the students should be able to do at the time of graduation with reference to a specific discipline.

Some important terminologies repeatedly used in LOCF.

Core Courses (CC) A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. These are the courses which provide basic understanding of their main discipline. In order to maintain a requisite standard certain core courses must be included in an academic program. This helps in providing a universal recognition to the said academic program.

Discipline Specific Elective Courses (DSE) Elective course may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective (DSE). These courses offer the flexibility of selection of options from a pool of courses. These are considered specialized or advanced to that particular programme and provide extensive exposure in the area chosen; these are also more applied in nature.

Generic Elective Courses An elective course chosen generally from an **unrelated discipline/subject**, with an intention to seek exposure is called a Generic Elective. Generic Elective courses are designed for the students of **other disciplines**. Thus, as per the CBCS policy, the students pursuing particular disciplines would have to opt Generic Elective courses offered by other disciplines, as per the basket of courses offered by the college. The scope of the Generic Elective (GE) Courses is positively related to the diversity of disciplines in which programmes are being offered by the college.

Non Major Elective (NME). A student shall choose at least two Non – major Elective Courses (NME) from outside his /her department. Non –Major Elective I – Those who choose Tamil in Part I can choose a non – major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level or b) Special Tamil if Tamil language was studied up to 10th & 12th std.

Skill Enhancement Courses (SECs) These courses focus on developing skills or proficiencies in the student, and aim at providing hands-on training. Skill enhancement courses can be opted by the students of any other discipline, but are highly suitable for students pursuing their academic programme. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

Field Study/Industrial Visit/Case Study: It has to be completed during the fifth semester of the degree programme. Credit for this course will be entered in the fifth semester's marks statement.

Internship: Students must complete internship during summer holidays after the fourth semester. They have to submit a report of internship training with the necessary documents and have to appear for a viva-voce examination during fifth semester. Credit for internship will be entered in the fifth semester's mark statement.

Extra Credit Courses: In order to facilitate the students, gaining knowledge/skills by attending online courses MOOC, credits are awarded as extra credits, the extra credit are at three semesters after verifying the course completion certificates. According to the guidelines of UGC, the students are encouraged to avail this option of enriching their knowledge by enrolling themselves in the Massive Open Online Courses (MOOC) provided by various portals such as SWAYAM, NPTEL etc.

Undergraduate Programme:

Programme Pattern: The Under Graduate degree programme consists of **FIVE** vital components.

They are as follows:

Part -I: Languages (Tamil / Hindi / French / Sanskrit) Part-

II: General English

Part-III: Core Course (Theory, Practical, Generic Elective courses, Discipline Specific Elective courses, Compulsory and Optional Allied courses, Project)

Part-IV: Non Major Elective, Foundation Course, Value Education, Environmental studies, Skill Enhancement Courses/ Soft Skills, Internship / field visit / industrial visit/ Case Study), Professional Competency Course

Part –V

Extension activity, Gender studies

EXAMINATION

Continuous Internal Assessment (CIA):

UG - Distribution of CIA Marks

Passing Minimum: 40 %

Assignment-3	=	30%
Test-3 (Best 2 out of 3)	=	50%
Seminar	=	10%
Attendance	=	10%

Question Paper Pattern

Part A:

Part A 1 (10X1=10 marks)

One word question/ Fill in/True or False/ Multiple Choice Questions Two Questions from Each unit

Part A 2 (5X2=10 marks)

Match the following Short Answers

One question from Each unit

Total Marks – 20

Part B: (5X5=25 marks)

Paragraph Answers

Either/ or type, One Question from each unit

Part C: (10X3=30)

Essay Type Answers Answer

3 out of 5 Questions One

Question from each unit **Part**

A: K1 Level

Part B: K2, K3 and K4 Level

Part C: K5 and K6 Level

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

S. No.	Level	Parameter	Description
1	K1	Knowledge/Remembering	It is the ability to remember the previously learned
2	K2	Comprehension/ Understanding	The learner explains ideas or concepts
3	K3	Application/Applying	The learner uses information in a new way
4	K4	Analysis/Analyzing	The learner distinguishes among different parts
5	K5	Evaluation/Evaluating	The learner justifies a stand or decision
6	K6	Synthesis /Creating	The learner creates a new product or point of view

WEIGHTAGE of K – LEVELS IN QUESTION PAPER

(Cognitive Level) K- LEVELS →	Lower Order Thinking			Higher Order Thinking			Total
	K1	K2	K3	K4	K5	K6	
END SEMESTER EXAMINATIONS (ESE)	20	25			30		75
Continuous Internal Assessment (CIA)	20	25			30		75

QUESTION PATTERN FOR END SEMESTER EXAMINATION/Continuous Internal Assessment							Assessment
PART							MARKS
PART –A I. (No choice, One Mark) TWO questions from each unit II. (No choice, Two Mark) ONE question from each unit					(10x1 =10) (5x2 =10)		20
PART -B (Either/ or type ,5-Marks) ONE questions from each unit					(5x5 =25)		25
PART -C (3 out of 5) (10 Marks) ONE question from each unit					(3x10 =30)		30
Total							75

BLUE PRINT OF QUESTION PAPER FOR END SEMESTER EXAMINATION							
DURATION: 3. 00 Hours.				Max Mark : 75			
K- LEVELS	K1	K 2	K3	K4	K5	K 6	Total Marks
PART							
PART –A (One Mark, No choice) (10x1=10) (2-Marks, No choice) (5x2=10)	10						10
	10						10
PART –B (5- Marks) (Either/or type) (5x5=25)		5	10	10			25
PART -C (10 Marks) (3 out of 5) (3x10=30) Courses having only K5, K6 levels, K5 level- 3 Questions, K6 level- 2 Questions (One K6 level question is compulsory)					20	10	30
Total	20	05	10	10	20	10	75

EVALUATION

GRADING SYSTEM

Once the marks of the CIA and the end-semester examination for each of the courses are available, they will be added and converted as final mark. The marks thus obtained will then be graded as per the scheme provided in Table-1.

Grade Point Average (GPA) will be calculated from the first semester onwards for all semester. From the second semester onwards, the total performance within a semester and the continuous performance starting from the first semester are indicated by semester Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA), respectively. These two are calculated by the following formulae:

$\text{GPA} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}$	$\text{WAM (Weighted Average Marks)} = \frac{\sum_{i=1}^n C_i M_i}{\sum_{i=1}^n C_i}$
Where, C_i is the Credit earned for the Course i G_i is the Grade Point obtained by the student for the Course i M_i is the marks obtained for the course i and n is the number of Courses Passed in that semester.	

CGPA: Average GPA of all the Courses starting from the first semester to the current semester.

CLASSIFICATION OF FINAL RESULTS:

1. For each of the first three parts, there shall be separate classification on the basis of CGPA, as indicated in Table-2.
2. For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management as Outstanding/Excellent/Very Good/Good/Above Average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided the candidate has secured the prescribed passing minimum in the all the Five parts of the Programme.
3. Grade in Part –IV and Part-V shall be shown separately and it shall not be taken into account for classification.
4. A Pass in PART- V will be mandatory although the marks will not count for the calculation of the CGPA.
5. Absence from an examination shall not be taken an attempt.

Table-1: Grading of the Courses - UG

Marks Range	Grade Point	Corresponding Grade
90 and above	10	O
80 and above and below 90	9	A+
70 and above and below 80	8	A
60 and above and below 70	7	B+
50 and above and below 60	6	B
40 and above and below 50	5	C
Below 40	NA	RA

The candidate's performance in every current semester is indicated by **Semester Grade Point Average (SGPA)** and from the second semester onwards, the continuous performance including previous semester /s is indicated by **Cumulative Grade Point Average (CGPA)**.

Table-3: Final Result

CGPA	Corresponding Grade	Classification of Final Result
9.00 and above	O	Outstanding
8.00 to 8.99	A+	Excellent
7.00 to 7.99	A	Very Good
6.00 to 6.99	B+	Good
5.00 to 5.99	B	Above Average
4.00 to 4.99	C	Average
Below 4.00	RA	Re-appearance

The candidates who have passed in the first appearance and within the prescribed duration of the UG programme are eligible. If the candidate's Grade is O/A+ with more than one attempt, the performance is fixed as "Very Good".

VISION

Attaining Global Recognition in Computer Science Education and to Develop the Software Professionals

MISSION

Imparting Quality Education through a Well – Designed Curriculum in tune with the Challenging Software Needs of the Industry

PROGRAMME OUTCOMES FOR B.Sc., DEGREE

PO No.	Programme Outcomes (Upon completion of the B.Sc. Degree Programme, the Undergraduate will be able to)
PO-1	Disciplinary knowledge: Demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate program of study in Bachelor of science.
PO-2	Critical thinking, Problem Solving and Reflective thinking: think critically about the issues and identify, critically analyze and solve problems from the disciplines of concern using appropriate tools and techniques and the knowledge, skills and attitudes acquired and extrapolate the same to real life situations; show critical sensibility to life experiences, with self-awareness and reflexivity of both self and society.
PO-3	Analytical & Scientific Reasoning: evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints; critically evaluate ideas, evidence, and experiences from an open minded and reasoned perspective.
PO-4	Research-related Skills: develop a sense of capability for relevant/appropriate inquiry and asking questions, synthesize, articulate and report results and to recognize and predict cause and effect relationships, define problems, formulate and establish hypothesis, analyze and interpret and draw conclusions from data, execute and report the results of an experiment or investigation.
PO-5	Digital literacy and Effective Communication: use ICT in a variety of learning situations and speak, read, write and listen clearly in person and through electronic media in English and in one or more Indian languages, and make meaning of the world by connecting people, ideas, books, media and technology; efficiently communicate thoughts and ideas in a clear and concise manner.
PO-6	Individual and Team Work: effectively accomplish tasks individually as well as work effectively and respectfully as member or leader with diverse teams, facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interest so for a common cause and work efficiently as a member of a team.
PO-7	Multicultural Competence and Social Interaction: understand the values and beliefs of multiple cultures, global perspectives, engage and interact respectfully with diverse groups and elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO-8	Awareness of Ethical issues, Human values and Gender Issues: embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work and understand the value of relationship between self and the community and aware of the various issues concerning women and society.
PO-9	Awareness of Environment and Sustainability: understand the impacts of technology and business practices in societal and environmental contexts, and sustainable development.
PO-10	Self-directed and Lifelong learning: acquire knowledge and skills, including learning "how to learn", that are necessary for participating in learning activities throughout life and to engage in independent and life-long learning in the broadest context of socio-technological changes.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc.. COMPUTER SCIENCE

PSO No.	Program Specific Outcomes (Upon completion of the B.Sc., COMPUTER SCIENCE Degree Programme, the Undergraduate will be able to)
PSO-1	Think in a critical and logical based manner
PSO-2	Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve problems in mathematics or statistics and real time application related sciences.
PSO-3	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
PSO-4	Understand, formulate, develop programming model with logical approaches to a Address issues arising in social science, business and other contexts.
PSO-5	Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of Computer science and Industrial statistics. .

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)

(Affiliated to Bharathidasan University) | (Accredited by NAAC)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

TAMILNADU, INDIA.



B.Sc., COMPUTER SCIENCE

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

(For the candidates admitted in the academic year 2024 – 2025)

ELIGIBILITY: Those who have completed in 10th , +2 examinations with Mathematics as one the core subject

Sem	Part	Nature of the Course	Course Code	Title of the Paper	Ins. Hours/ Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
I	I	Language Course-I	U24LC101	Pothu Tamil-I Tamil Ilakkiya Varalaru -I	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-I	U24ELC101	General English – I	6	5	1	-	-	3	3	25	75	100
	III	Core Course-I	U24CS101	Python Programming	5	4	1	-	-	5	3	25	75	100
		Core Practical-I	U24CS102P	Python Programming Lab	4	1	-	3	-	4	3	25	75	100
		Allied Course-I	U24AMA101	Statistics	3	2	1	-	-	2	3	25	75	100
		Allied course-II	U24AMA102	Numerical Analysis	2	1	1	-	-	-	-	-	-	-
		Non Major Elective- Course- I - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a)Basic Tamil if Tamil language was not studied in school level (or) b)Special Tamil if Tamil language was studied upto 10th & 12thstd.			2	1	1	-	-	2	3	25	75	100
	IV	Foundation Course	U24FCCS11	Problem Solving Techniques	2	1	1	-	-	2	3	25	75	100
	TOTAL				30	20	7	3	-	21	-	-	-	700
II	I	Language Course-II	U24LC202	Pothu Tamil -II Tamil Ilakkiya Varalaru -II	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-II	U24ELC202	General English – II	6	5	1	-	-	3	3	25	75	100
		Core Course-II	U24CS203	Data Structures and Algorithms	5	4	1	-	-	5	3	25	75	100

Sem	Part	Nature of the Course	Course Code	Title of the Paper	Ins. Hours/ Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
	III	Core Practical-II	U24CS204P	Data Structures and Algorithms Lab	4	1	-	3	-	4	3	25	75	100
		Allied Course-II	U24AMA102	Numerical Analysis	2	1	1	-	-	2	3	25	75	100
		Allied Course – III	U24AMA203	Operations Research	3	2	1	-	-	2	3	25	75	100
	IV	Non Major Elective- Course- II Those who choose Tamil in Part I can choose a non-major elective course offered by other departments. Those who do not choose Tamil in Part I must choose either a) Basic Tamil if Tamil language was not studied in school level (or) b) Special Tamil if Tamil language was studied upto 10th & 12thstd.			2	1	1	-	-	2	3	25	75	100
		Skill Enhancement Course-I	U24SECS21	R Programming	2	1	1	-	-	2	3	25	75	100
		TOTAL				30	20	7	3	-	23	-	-	-
	II I	I	Language Course-III	U24LC303	Pothu Tamil –III Tamilazha Varalarum Panpadum-III	6	5	1	-	-	3	3	25	75
II		English Language course-III	U24ELC303	General English –III	6	5	1	-	-	3	3	25	75	100
III		Core Course-III	U24CS305	Java Programming	4	3	1	-	-	4	3	25	75	100
		Core Practical-III	U24CS306P	Java Programming Lab	4	1	-	3	-	4	3	25	75	100
		Allied Course-IV	U24APH301	Applied Physics – I	2	1	1	-	-	2	3	25	75	100
		Allied Practical-I	U24APH302P	Applied Physics Practical	2	-	-	2	-	-	-	--	--	--
IV		Skill Enhance ment Course-II	U24SECS32	Fundamentals of office automation	2	1	1	-	-	2	3	25	75	100
		Skill Enhancement Course-III	U24SECS33	Graphic Design with Photoshop	2	1	1	-	-	2	3	25	75	100

Sem	Part	Nature of the Course	Course Code	Title of the Paper	Ins. Hours/ Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
	V	Special Course	U24UGSC	Health and Wellness	2	-	-	2	-	1	-	-	-	-
		TOTAL			30	17	6	7	-	21	-	-	-	700
IV	I	Language Course-IV	U24LC404	Pothu Tamil –IV Tamilum Ariviyalum -IV	6	5	1	-	-	3	3	25	75	100
	II	English Language Course-IV	U24ELC404	General English – IV	6	5	1	-	-	3	3	25	75	100
	III	Core Course IV	U24CS407	Database Management System	5	4	1	-	-	5	3	25	75	100
		Core Practical -IV	U24CS408P	Database Management System Lab	4	1	-	3	-	4	3	25	75	100
		Allied Course – V	U24APH403	Applied Physics – II	3	2	1	-	-	2	3	25	75	100
		Allied Practical –I	U24APH302P	Applied Physics Practical	2	-	-	2	-	2	3	25	75	100
	IV	Skill Enhancement Course-IV	U24SECS44	Fundamentals of Internet	2	1	1	-	-	2	3	25	75	100
		Skill Enhancement Course –V	U24SECS45	Multimedia Systems	2	1	1	-	-	2	3	25	75	100
		TOTAL			30	19	6	5	-	23	-	-	-	800
V	III	Core Course-V	U24CS509	Computer Networks	6	5	1	-	-	5	3	25	75	100
		Core Course – VI	U24CS510	PHP Programming	5	4	1	-	-	5	3	25	75	100
		Core Course-VII	U24CS511	Operating Systems	5	4	1	-	-	4	3	25	75	100
		Core Practical- V	U24CS512P	PHP Programing Lab	4	-	1	3	-	4	3	25	75	100
		Elective Course-I	U24CSE51A/ U24CSE51B/ U24CSE51C	Artificial Intelligence/ Software Engineering /Microprocessor and Microcontroller	4	3	1	-	-	3	3	25	75	100
		Elective Course –II	U24CSE52A/ U24CSE52B/ U24CSE52C	Cloud Computing/Data Mining /Distributed Computing	4	3	1	-	-	3	3	25	75	100
	IV	Environmental Studies	24UGCES	Environmental Studies	2	1	1	-	-	2	3	25	75	100
		Internship/ Industrial visit/ Field visit	U24CSI51	Internship/ Industrial visit/ Field visit	-	-	-	-	-	2	-	-	-	-
		TOTAL			30	20	7	3	-	28	-	-	-	700
VI	III	Core Course-VIII	U24CS613	Programming with .NET	6	5	1	-	-	4	3	25	75	100
		Core Practical- VI	U24CS614P	Programming with .NET Lab	6	-	1	5	-	4	3	25	75	100
		Core Project	U24CSPW	Project with viva-voce/ Group Project	5	-	1	4	-	5	3	25	75	100
		Elective Course-III	U24CSE63A/ U24CSE63B/ U24CSE63C	Introduction to Data Science/Software Testing/Machine learning	4	3	1	-	-	3	3	25	75	100

Sem	Part	Nature of the Course	Course Code	Title of the Paper	Ins. Hours/ Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
		Elective Course- IV	U24CSE64A/ U24CSE64B/ U24CSE64C	Information Security/Internet of Things /Mobile Application Development	4	3	1	-	-	3	3	25	75	100
	IV	Value Education	24UGVED	Value Education	2	1	-	-	1	2	3	25	75	100
		Professional Cmpetency Course	U24PCCS61	Aptitude and reasoning skills for competitive examinations	2	1	1	-	-	2	3	25	75	100
	V	Gender Studies	24UGGS	Gender Studies	1	1	-	-	-	1	3	25	75	100
		Extension activity		Extension activity	-	-	-	-	-	1	-	-	-	-
		TOTAL			30	14	6	9	1	25	-	-	-	800
		GRAND TOTAL			180	110	39	30	1	141	-	-	-	4500

L-Lecture

T-Tutorial

P-Practical

S-Seminar

Credit Distribution for UG PROGRAMME-Science

S. No	Part	Subject	No. of Courses	Total Credits
1	I	Language Course	4	12
2	II	English Language Course	4	12
3	III	Core Course –Theory	8	37
4		Core Practical	6	24
5		Core Project	1	05
6		Allied Course – Theory	5	10
7		Allied Practical	1	02
8	IV	Elective Course	4	12
9		Non-Major Elective	2	04
10		Foundation Course	1	02
11		Skill Enhancement Course	5	10
12		Internship/ Industrial visit/ Field visit	1	02
13		Environmental Studies	1	02
14		Value Education	1	02
15	V	Professional Competency Course	1	02
16		Gender Studies	1	01
17		Extension Activity	1	01
18		Special Course (Health and Wellness)	1	01
Total			48	141

For those who studied Tamil up to 10th +2 (Regular Stream)

+ Syllabus for other Languages should be on par with Tamil at degree level

#those who studied Tamil up to 10th +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV

** Extension Activities shall be outside instruction hours

Note:

	CIA	ESE
1. Theory	25	75
2. Practical	25	75
3. Separate passing minimum is prescribed for Internal and External marks		

FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

NON-MAJORELECTIVE (NME) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Course Code	Title of the Paper
I	IV	NME –I	U24NMECS11	Office Automation
II		NME –II	U24NMECS22	Introduction to Web design

SEMESTER V



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),
SUNDARAKKOTTAI, MANNARGUDI – 614016.
(For the candidates admitted in the academic year 2024– 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: V - CC-V : COMPUTER NETWORKS

Ins. Hrs. /Week: 6

Course Credit:5

Course Code:U24CS509

UNIT- I INTRODUCTION

(19 Hours)

Data Communications: Components, Data Representation, Data Flow- Networks: Network criteria, Physical structures - Network Types: LAN, WAN, Switching, The Internet-**Network Models:** TCP/IP Protocol Suite - The OSI Model. **Physical Layer:** Multiplexing: FDM, WDM, TDM - Spread Spectrum: FHSS, DSSS-Transmission Media: Guided Media-Unguided Media.

UNIT- II DATA LINK LAYER

(17 Hours)

Introduction to Error Deduction and Correction: – Block Coding- Linear Block Codes- Cyclic codes- Checksum- **Data link Control:** DLC Services: Framing, Flow and Error Control, Connection less and connection-oriented - Data-Link Layer Protocols: Simple Protocol, Stop and Wait Protocol, Piggybacking.

UNIT -III TRANSPORT LAYER

(18 Hours)

Process-To-Process Delivery-Transport Layer Protocols- User Datagram Protocol - User Datagram - Checksum - TCP Services- TCP features - Windows in TCP - Flow Control - Error Control- TCP Congestion Control Data Traffic- Congestion- Congestion Control- Quality of Service - Techniques to Improve Quality of Service- Integrated Services.

UNIT- IV SESSION LAYER

(19 Hours)

Client Server Programming: API, Using Services of the transport layer, Iterative Communication using UDP & TCP, Concurrent communication

UNIT- V APPLICATION AND PRESENTATION LAYER

(17 Hours)

World Wide Web - HTTP- File Transfer Protocol- Electronic mail: Architecture, Web based mail, E- Mail security- Domain Name System -Data formatting- Data Compression Data Encryption-Syntax and Semantics -ASCII MIME

Total Lecture Hours-90

COURSE OUTCOME

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

1. Identify the Networks types, models and OSI layers
2. Understand the Data link layer and working of connection devices
3. Understand about the Addressing modes
4. Understand the TCP Services and Features
5. Obtain the knowledge in WWW, FTP, Email

TEXT BOOKS

1. Behrouz Forouzan 2013, A Data Communications and Networking, , Tata McGrawHill, Fifth Edition, NewDelhi, India.
2. Larry Peterson.L and Bruce Davie.S 2006, Morgan Computer Networks, KaufmannPublishers , Burlington, Massachusetts, USA.

REFERENCE BOOK(S)

1. Achyut Godbole and Atul Kahate 2011, Data Communications and Networks, McGraw Hill Education, New Delhi, India.
2. Andrew Tennabaum.S 2013, Computer Networks, Fifth Edition Pearson Publication, India.
3. James Kurose .F, Keith Ross.W 2016. Computer Networking , A Top down Approach,Sixth Edition Pearson Publication, India.

E-RESOURCES

1. <https://www.albany.edu/~goel/classes/fall2002/msi603/notes/osi.ppt>
2. <http://index-of.es/Varios-2/Computer%20Networks%205th%20Edition.pdf>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3) M-Medium (2) L-Low (1)

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),**



SUNDARAKKOTTAI, MANNARGUDI – 614016.
(For the candidates admitted in the academic year 2024– 2025)

**PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE**

Semester: V-CC- VI: PHP PROGRAMMING

Ins. Hrs. /Week:5

Course Credit:5

Course Code: U24CS510

UNIT- I ESSENTIALS OF PHP

(15 Hours)

Getting PHP-Creating a First PHP Page-Mixing HTML and PHP-Using PHP —Here Documents- Command Line PHP- Working with Variables –Creating constants- **Operators and Flow control:** Operators in PHP-PHP Operator Precedence- Decision making statements-Looping Statements-**Strings and Arrays:** The String Functions-Building Arrays-Handling Arrays with Loops-The PHP Array Functions-Sorting Arrays-Handling Multidimensional Arrays-Other Array Functions.

UNIT –II CREATING FUNCTION

(15 Hours)

Creating functions in PHP-Passing by Reference-Returning Data From Functions- Using Default Arguments- Introducing Variable Scope in PHP-Nesting Functions- **Reading Data in Web Pages:** Setting Up Web Pages to Communicate with PHP- Handling Controls-Handling File Uploads-Handling Buttons - **PHP Browser Handling Power:** Using PHP's Server Variables-Using HTTP Headers- Handling Form Data with Custom Arrays- Performing Data Validation-Client Side Data Validation .

UNIT-III OBJECT-ORIENTED PROGRAMMING

(15 Hours)

Creating Classes and Objects–Setting Access to Properties and Methods- Constructors-Destructors- Basing One Class on Another with Inheritance- Overriding methods-Overloading Methods-Auto loading Classes-**Advanced Object Oriented Programming :** Creating Static Methods-Abstract Classes- Creating Interfaces-Creating Class Constants-Using Final Keyword-Cloning Objects .

UNIT -IV FILE HANDLING

(15 Hours)

Opening Files Using fopen -Reading a file Content-Closing a file –Writing a file with write –Locking Files-**Working with Databases:** Creating a MySQL Database- Creating a Table-Accessing the Database in PHP-Updating Databases -Inserting New Data Items into a Database– **Sessions, Cookies, and FTP:** PHP Cookie-Setting Cookies- Expiration-Working FTP- Sending E-mail-Storing Data in Sessions.

UNIT-V AJAX

(15 Hours)

Getting Started with Ajax-Writing Ajax-Creating the XML HTTP Request Object – Opening the XML HTTP Request Object –Handling Downloaded Data- Ajax with Some PHP-Passing Data to the Server with GET and POST Methods- Handling

Total Lecture Hours-75

1. Analyze the essentials of PHP
2. Understand about the functions in PHP
3. Describe about file handling methods in PHP
4. Implement various MySQL Database query
5. Understand the advanced concept AJAX

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07	
	CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
	CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
	CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
	CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
	CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2
S-Strong (3)			M-Medium (2)						L-Low (1)									



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),
SUNDARAKKOTTAI, MANNARGUDI - 614016.
the candidates admitted in the academic year 2024- 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: V -CC-VII: OPERATING SYSTEMS

Ins. Hrs. /Week:5 Course Credit:4 Course Code: U24CS511

UNIT -I INTRODUCTION (15 Hours)

Evolution of operating systems- Serial Processing - Batch Processing - Multi Programming- **Functions of OS:** Memory Management Functions - Processor / Process Management Functions - Device Management Functions - Information Management Functions – **Types of Operating Systems:** Batch Operating System-Multi Programming Operating System - Multitasking Operating System - Multi-user Operating System - Multithreading - Time Sharing System - Real Time Systems – Interrupt Structure & processing.

UNIT -II MEMORY MANAGEMENT (15 Hours)

Single Contiguous Allocation- Partitioned Allocation – Relocatable Partitions allocations – Paged Memory Management- Demand paged Memory Management –Page Removal Algorithms -FIFO- LRU- **Virtual Memory Management:** Segmented Memory Management – Segmented and Demand paged Memory Management – Other Memory Management Techniques-overlay Techniques – Swapping.

UNIT -III PROCESSOR MANAGEMENT (15 Hours)

Job Scheduling –Job Scheduling functions & Policies - Process Scheduling – Process Scheduling Functions and Policies – Evolution of Round Robin Multiprogramming Performance – Process Synchronization – Wait and Signal mechanisms – Semaphores - P & V Operations – Deadlock- Deadlock Prevention-Deadlock Detection- Banker's Algorithm.

UNIT -IV DEVICE MANAGEMENT (15 Hours)

Techniques for Device Management-Dedicated, Shared and Virtual – Device Characteristics-Serial Access Devices - Completely Direct Access - Direct Access Storage device- Magnetic disks -Optical Disk-Flash memory - I/O Traffic Controller, I/O Scheduler, I/O Device Handlers – Communication among Devices- Management of I/O Requests.

UNIT- V Information Management (15 Hours)

File system model – Symbolic File System- Basic file system - Access Control verification - General Model of a File System-Sequential Access-Direct/Random Access- Indexed sequential Access- Physical File System and Logical File System -Allocation strategy Module-Device Strategy Modules.

Total Lecture Hours-75

COURSE OUTCOME

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

1. Understand the evolution of operating system
2. Compare and contrast the various memory management schemes
3. Analyze various scheduling algorithm, deadlock prevention and avoidance algorithms
4. Understand the concept of device management
5. Describe the concepts of file management systems

TEXT BOOKS

1. Dhamdhere D.M , System Programming and Operating Systems – Tata McGraw Hill Publishing Co.,Limited, New Delhi.
2. Madnick.S.E and Donovan J J 2013, —Operating Systems|| McGraw Hill International Book Co,New Delhi.

REFERENCE BOOK(S)

1. Dhamdhere .D.M, —Operating Systems: A Concept-Based Approach||, McGraw Hill Education; NewDelhi.
2. Harvey Deitel M, 1984, —An Introduction to operating system|| Addison - Wesley Publishing Co.New York.
3. James Peterson.L & Abraham Silbertschatz, 1987, —An Introduction to operating system|| Addison -Wesley Publishing Co. New York.

E-RESOURCES

1. https://www.tutorialspoint.com/operating_system/index.htm
2. <http://www.ddegjust.ac.in/studymaterial/mca-5/mca-105.pdf>
3. <http://www.freebookcentre.net/ComputerScience-Books-Download/Notes-on-Operating- Systems.html>
4. <http://www.freebookcentre.net/ComputerScience-Books-Download/Operating-Systems-Lecture- Notes-by-Stanford-University.html>
5. <http://www.freebookcentre.net/ComputerScience-Books-Download/Lecture-Notes-On-Operating- Systems-Mrs.-Sk-Abeeda.html>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-CP-V: PHP PROGRAMMING LAB

Ins. Hrs. /Week: 4

Course Credit: 4

Course Code: U24CS512P

EXERCISES

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements.
3. Write a program to find the maximum value in a given Multidimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.
6. Design a web page that should compute one's age on a given date.
7. Write a program to download a file from the server.
8. Write a program to store the current date and time in a COOKIE and display the Last Visited date and time on the web page.
9. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.
10. Write a program to design a simple calculator.
11. Write a program to draw the human face.
12. Design an authentication web page in PHP with MySQL to check username and password.
13. Write a PHP program to generate menu creation (useful for web application).
14. Write a PHP program to create an PHP Ajax application.

COURSE OUTCOME

Students are able to

1. Implement the basic concepts of PHP
2. Design programs using user defined functions
3. Apply file handling methods
4. Use Image functions to draw images
5. Create simple web page

Total Lecture Hours-60

TEXT BOOKS

1. Gopalan N.P, Akilandeswari.J 2008, 『Web Technology』 A Developer's Perspective, Prentice Hall of India Private Limited, New Delhi.
2. Steven Holzner 2007, The PHP Complete Reference McGrawHill Education, New Delhi, India.

REFERENCE BOOK(S)

1. Rajinder Kumar, Gunjan Gupta 2020. Web Development using PHP , First Edition, ISHAN Publications, Ambala, Haryana 134003, India.
2. Robin Nixon, — Learning PHP, MySQL & JavaScript With jQuery, CSS & HTML5 O'Reilly Publications, California, USA.
3. Vikram Vaswani 2008, PHP: A Beginner's Guide, Fourth Edition, McGraw Hill Education, New Delhi, India.

E-RESOURCES

1. https://www.tutorialspoint.com/php/php_tutorial.pdf
2. <https://www.slideshare.net/hemaprasanth/ajax-ppt-4410119>

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI - 614016.

(For the candidates admitted in the academic year 2024- 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V -EC-IA: ARTIFICIAL INTELLIGENCE

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE51A

UNIT-I ARTIFICIAL INTELLIGENCE

(12 Hours)

AI Problems – Underlying Assumption – AI Technique – Level of the Model – Criteria of Success – Some General References. Problems, Problem Spaces, and Search: Defining the Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programs.

UNIT- II HEURISTIC SEARCH TECHNIQUES

(12 Hours)

Generate and Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction – Means-ends Analysis. Knowledge Representation Issues: Representations and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation – The Frame Problem.

UNIT -III USING PREDICATE LOGIC

(12 Hours)

Representing Simple Facts in Logic – Representing Instance and ISA Relationships – Computable Functions and Predicates – Resolution – Natural Deduction - Representing Knowledge Using Rules: Procedural Versus Declarative Knowledge – Logic Programming – Forward Versus Backward Reasoning – Matching – Control Knowledge

UNIT -IV SYMBOLIC REASONING UNDER UNCERTAINTY

(12 Hours)

Introduction to Non-monotonic Reasoning – Logics for Non-monotonic Reasoning – Implementation Issues – Augmenting a Problem-solver – Implementation Depth First Search – Implementation Breadth First Search. Statistical Reasoning: Probability and Baye's Theorem – Certainty Factors and Rule- based Systems – Bayesian Networks – Dempster-Shafer Theory – Fuzzy Logic

UNIT-V KNOWLEDG REPRESENTATION TECHNIQUES (12 Hours)

Semantic Nets- Frames.- Conceptual Dependency – Scripts – CYC. - Syntactic- Semantic Spectrum of Representation – Logic and Slot-and-Filler Structures – Other Representational Techniques.

Total Lecture Hours-60

COURSE OUTCOME

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

1. To understand the basic idea of artificial intelligence and its application areas.
2. To apply basic principles of AI in solutions that requires problem solving, inference, perception, knowledge representation, and learning.
3. To demonstrate awareness and a fundamental understanding of various applications of AI techniques.
4. To understand about Logic programming and about Reasoning related to AI.
5. To know about the different representational techniques in AI.

TEXT BOOKS

1. Kevin Night, Elaine Rich, and Nair B., "Artificial Intelligence", McGraw Hill, 2017
2. M. Tim Jones, - Artificial Intelligence: A Systems Approach (Computer Science), Jones and Bartlett Publishers Inc.; First Edition, 2008.

REFERENCE BOOK(S)

1. Nils J. Nilsson, - The Quest for Artificial Intelligence, Cambridge University Press, 2009.
2. Gerhard Welss, - Multi Agents Systems, Second Edition, 2013
3. David L. Poole and Alan K. Mackworth, - Artificial Intelligence: Foundations of Computational Agents, Cambridge University Press, 2010.
4. Dan W. Patterson, "Introduction to AI and ES", Pearson Education, 2007

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S
COLLEGE**

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

**PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE**

Semester: V-EC-IB : SOFTWARE ENGINEERING

Ins. Hrs. /Week: 4

Course Credit:3

Course Code: U24CSE51B

UNIT –I INTRODUCTION

(12 Hours)

Introduction to Software Engineering - Software Process - Software Process Models - Software Model - **Requirements Engineering Principles** : Requirements Engineering - Importance of Requirements - **Types of Requirements**: Feasibility Study- Requirement Gathering-Software requirement Specification-Software Requirement Validation- Steps involved in Requirements Engineering.

UNIT- II REQUIREMENTS ANALYSIS MODELING

(12 Hours)

Analysis Modeling Approaches - Structured Analysis - Object Oriented Analysis - **Design and Architectural Engineering** : Design Process and Concepts - Basic Issues in Software Design - Characteristics of Good Design - Software Design and Software Engineering - Function Oriented System vs Object Oriented System – Modularity- Cohesion- Coupling -Layering - Real Time Software Design - Design Models - Design Documentation.

UNIT- III OBJECT ORIENTED CONCEPTS

(12 Hours)

Fundamental Parts of Object Oriented Approach - Data Hiding and Class Hierarchy Creation - Relationships - Role of UML in OO Design - Design Patterns - Frameworks - Object Oriented Analysis - Object Oriented Design - **User Interface Design** : Concepts of User Interface - Elements of User Interface - Designing the User Interface - User Interface Evaluation - Golden Rules of User Interface Design - User Interface Models – Usability.

UNIT-IV SOFTWARE CODING AND CONFIGURATION

(12 Hours)

Software Coding: Introduction-Programming Principles-Programming Guidelines-Coding Conventions-Key Concepts in software coding- Introduction to Software Measurement and Metrics - Software Estimation Tools, Techniques and Models - Software Configuration - Project Management Introduction

UNIT-V Software Testing and Web Engineering

(12 Hours)

Software Testing: Introduction to Software Testing-Types of Software Testing-Functional Software Testing- Non-Functional Software Testing - Software Maintenance-Introduction to Web - General Web Characteristics - Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering

Total Lecture Hours-60

COURSE OUTCOME

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

1. Implement the concepts of software engineering
2. Understand the Design and Architectural Engineering
3. Describe about Object Oriented Concepts
4. Understand about Software coding and Configuration
5. Learn about Emerging Trends in Software Engineering

TEXT BOOKS

1. Prof. Aggarwal. K.K, Prof. Yogesh Singh 2019, Software Engineering, New Age International (P) Ltd., Publishers, New Delhi, India.
2. Chandramouli Subramanian, Saikat Dutt, Chandramouli Seetharaman, Geetha.B.G 2015, Software Engineering, Pearson Publications, London.

REFERENCE BOOK(S)

1. Jibitesh Mishra 2011, Software Engineering, Pearson Education, London.
2. Ian Sommerville 2017, Software Engineering, Tenth edition, Pearson Education, London.
3. Pressman 2004, Software Engineering, 6th Edition, McGraw-Hill Education, India.

E-RESOURCES

1. https://www.tutorialspoint.com/software_engineering/Software_engineering_pdf_version.htm.
2. <https://www.youtube.com/watch?v=Z6f9ckEElsU>.

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE UTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024– 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V -EC-IC: MICROPROCESSOR AND MICROCONTROLLER

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE51C

UNIT I INTRODUCTION TO MICROPROCESSOR

(12 Hours)

Single chip Microcomputer – Microprocessor Applications –Buses- Memory Addressing capacity and CPU – Microcomputers – Processor Architecture – Intel 8085 – Instruction cycle – Timing Diagram

UNIT II INSTRUCTION SET

(12 Hours)

Instruction Set of Intel 8085 – Instruction and Data Format – Address Modes – Status Flags – Intel 8085 instruction - Programming Microprocessor – Assembly language – Assembler.

UNIT III INTRODUCTION TO MICROCONTROLLERS

(12 Hours)

Overview of 8051 Microcontroller, Architecture, I/O Ports, Memory Organization, Addressing Modes and Instruction set of 8051. 8051 Real Time Control: Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Programming 8051 Timers and Counters.

UNIT IV I/O AND MEMORY INTERFACE

(12 Hours)

LCD, Keyboard, External Memory RAM, ROM Interface, ADC, DAC Interface to 8051. Serial Communication and Bus Interface: Serial Communication Standards, Serial Data Transfer Scheme, On board Communication Interfaces- I2C Bus, SPI Bus, UART; External Communication Interfaces-RS232, USB.

UNIT V ARM ARCHITECTURE

(12 Hours)

ARM Processor fundamentals, ARM Architecture – Register, CPSR, Pipeline, exceptions and interrupts interrupt vector table, ARM instruction set – Data processing, Branch instructions, load store instructions, Software interrupt instructions, Program status register instructions, loading constants, Conditional execution, Introduction to Thumb instructions.

Total Lecture Hours-60

COURSE OUTCOME

- On the successful completion of the course, the students will be able to,
1. Understand the internal architecture and organization of microprocessor and micro controller
 2. Analyze the instructions and Assembly language programs
 3. Discuss the I/O and Memory Interface
 4. Discuss the input /output ,memory interface, Serial Communication and Bus Interface devices Analyze the internal architecture of ARM Processors
 5. Apply techniques for loading constants and using conditional execution to implement efficient ARM assembly routines.

TEXT BOOKS

1. Fundamentals of Microprocessors and Microcomputers, Badri Ram, Eighth Edition, Dhanpat Rai Publications, 2012.
2. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandani, MHE, 2nd Edition 2006.
3. The 8051 Microcontroller, Kenneth. J. Ayala, Cengage Learning, 3rd Ed.
4. ARM System Developers guide, Andrew N SLOSS, Dominic SYMES, Chris WRIGHT, Elsevier, 2012

REFERENCE BOOK(S)

1. Microprocessors and Interfacing, D. V. Hall, MGH, 2nd Edition 2006.
2. Introduction to Embedded Systems, Shibu K.V, MHE, 2009
3. The 8051 Microcontrollers, Architecture and Programming and Applications -K.Uma Rao, AndhePallavi, Pearson, 2009.
4. Microprocessors and Microcontrollers, Senthil Kumar Saravanan, Jeevananthan, Oxford Univ Press, 2010

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01			P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03		PS05	PS06	PS07
CO1	3	3		2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1		3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3		2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3		3	2	2	3	2	3	3	2	3	1		2	3	3
CO5	3	3		3	3	3	3	3	2	3	2	2	3		2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)



PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-EC-IIA: CLOUD COMPUTING

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE52A

UNIT- I CLOUD COMPUTING FOUNDATION

(12 Hours)

Introduction to Cloud Computing -Cloud Computing Basics –History of cloud computing-Importance of Cloud Computing in the Current Era-Characteristics of Cloud Computing .Move to Cloud: Pros and Cons of Cloud Computing – Migrating into cloud. Types of Cloud: Public and Private Cloud - Cloud Infrastructure. Working of Cloud Computing: Trends in Computing-Cloud services model – Cloud Deployment Models.

UNIT-II CLOUD COMPUTING ARCHITECTURE

(12 Hours)

Cloud Computing Technology: Cloud Life Cycle Model- Reference Model for Cloud Computing. Cloud Architecture: Cloud Computing Logical Architecture- Cloud System Architecture. Cloud Modeling and Design: Cloud Basic Principles- Model for Federated Cloud computing-Cloud Eco System Model-Cloud Governance.

UNIT-III VIRTUALIZATION

(12 Hours)

Foundations : Introduction to Virtualization-Types of Virtualization-Virtual Clustering. Grid, Cloud and Virtualization: Virtualization in grid – Virtualization in cloud –Virtualization and cloud security. Virtualization and Cloud Computing: Anatomy of Cloud Infrastructure-Virtual Infrastructures – CPU Virtualization .

UNIT- IV DATA STORAGE AND CLOUD COMPUTING DATA STORAGE
(12 Hours)

Introduction to Enterprise Data Storage-Data Storage Management-File Systems Cloud Data Stores. Cloud Storage-Overview of Cloud Storage-Data Management for Cloud Storage. Risks in Cloud Computing: Risk Management-Cloud Impact-Enterprise Wide Risks in Management-Types of Risks in Cloud Computing.

UNIT-V TOOLS AND APPLICATIONS

(12 Hours)

Cloud Computing Tools - Moving Applications to the Cloud – Cloud Opportunities -Cloud Mashups – Apache Hadoop – Cloud Tools. Cloud Applications: Microsoft Cloud Services. Google Cloud Applications : Google Applications Utilizing Cloud-Google App Engine. Amazon Cloud Services Understanding Amazon Web Components and Services-Elastic Compute Cloud. **Case Study:** Cloud Software for Private Banking- Cloud Software for Asset Management –Cloud Software for Fund Management.

Total Lecture Hours-60

COURSE OUTCOME

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

1. Understand Cloud Computing and different Cloud service and deployment models
2. Describe importance of virtualization along with their technologies
3. Use and Examine different cloud computing services
4. Understand the cloud computing security
5. Understand the cloud applications and concepts of Amazon cloud services

TEXT BOOK

1. Srinivasan.A and Suresh.J 2014, Cloud Computing – A Practical Approach for Learning and Implementation, Pearson Publication, India.

REFERENCE BOOK(S)

1. Barrie Sonsinsky 2011, —Cloud Computing Bible, 1st Edition, Wiley India Pvt.Ltd., New Delhi. Kannammal.A 2015, ||
2. Fundamentals of Cloud Computing, 1st Edition .Cengage Learning Private Limited, India.
3. Mehul Mahrishi Kamal Kant Hiran, Ruchi Doshi, Dr.Fagbola Temitayo 2019. —Cloud Computing, 1st Edition ,BPB Publications, New Delhi.
4. Rajkumar Buyya 2011, James Broberg, Andrzej Goscinsky, —Cloud Computing Principles and Paradigms, Wiley Pvt. Ltd, India.

E- RESOURCES

1. <https://www.javatpoint.com/cloud-computing-architecture>
2. https://www.tutorialspoint.com/cloud_computing/index.htm

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),
SUNDARAKKOTTAL, MANNARGUDI – 614016.
(For the candidates admitted in the academic year 2024 – 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: V-EC-IIB: DATA MINING

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE52B

UNIT-1 INTRODUCTION

(12 Hours)

Data mining – Functionalities – Classification – Introduction to Data Warehousing – Data Preprocessing: Preprocessing the Data – Data cleaning – Data Integration and Transformation – Data Reduction.

UNIT-II SYSTEM ARCHITECTURE

(12 Hours)

Data Mining, Primitives, Languages and System Architecture: Data Mining – Primitives – Data Mining Query Language, Architecture of Data mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison – Statistical Measures.

UNIT-III MINING ASSOCIATION RULES

(12Hours)

Basic Concepts – Single Dimensional Boolean Association Rules From Transaction Databases, Multilevel Association Rules from transaction databases – Multi dimension Association Rules from Relational Database and Data Warehouses.

UNIT-IV CLASSIFICATION AND PREDICTION

(12 Hours)

Introduction – Issues – Decision Tree Induction – Bayesian Classification – Classification of Back Propagation. Classification based on Concepts from Association Rule Mining – Other Methods. Prediction – Introduction – Classifier Accuracy

UNIT-V CLUSTER ANALYSIS

(12 Hours)

Introduction – Types of Data in Cluster Analysis, Partitioning Methods – Hierarchical Methods-Density Based Methods – GRID Based Method – Model based Clustering Method.

Total Lecture Hours-60

COURSE OUTCOME

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

- 1 To understand the basic concepts and the functionality of the various data mining and data warehousing component
- 2 To know the concepts of Data mining system architectures
- 3 To analyze the principles of association rules
- 4 To get analytical idea on Classification and prediction methods.
- 5 To Gain knowledge on Cluster analysis and its methods.

TEXT BOOKS

1. Han and M. Kamber, "Data Mining Concepts and Techniques", 2001, Harcourt India Pvt. Ltd, New Delhi.

REFERENCE BOOK(S)

1. K.P. Soman, Shyam Diwakar, V. Ajay "Insight into Data Mining Theory and Practice ",
Prentice Hall of India Pvt. Ltd, New Delhi
2. Parteek Bhatia, 'Data Mining and Data Warehousing: Principles and Practical Techniques',
Cambridge University Press, 2019

E-RESOURCES

Web resources from NDL Library, E-content from open-source libraries

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
C01	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
C02	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
C03	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
C04	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
C05	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)



PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-EC-II C: Distributed Computing

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CS52C

UNIT -I INTRODUCTION

(12 Hours)

Introduction: Definition-Relation to Computer System Components – Motivation – Message -Passing Systems versus Shared Memory Systems – Primitives for Distributed Communication – Synchronous versus Asynchronous Executions – Design Issues and Challenges; A Model of Distributed Computations: A Distributed Program – A Model of Distributed Executions – Models of Communication Networks – Global State of a Distributed System.

UNIT- II LOGICAL TIME AND GLOBAL STATE

(12 Hours)

Logical Time: Physical Clock Synchronization: NTP – A Framework for a System of Logical Clocks – Scalar Time – Vector Time; Message Ordering and Group Communication: Message Ordering Paradigms – Asynchronous Execution with Synchronous Communication – Synchronous Program Order on Asynchronous System – Group Communication – Causal Order – Total Order; Global State and Snapshot Recording Algorithms: Introduction – System Model and Definitions – Snapshot Algorithms for FIFO Channels.

UNIT -III DISTRIBUTED MUTEX

(12 Hours)

Distributed Mutual exclusion Algorithms: Introduction – Preliminaries – Lamport's algorithm – Ricart- Agrawala's Algorithm -- Token-Based Algorithms – Suzuki-Kasami's Broadcast Algorithm.

UNIT- IV DEADLOCK

(12 Hours)

Deadlock Detection in Distributed Systems: Introduction – System Model – Preliminaries – Models of Deadlocks – Chandy-Misra-Haas Algorithm for the AND model and OR Model.

UNIT- IV CONSENSUS AND RECOVERY

(12 Hours)

Consensus and Agreement Algorithms: Problem Definition – Overview of Results – Agreement in a Failure-Free System(Synchronous and Asynchronous) – Agreement in Synchronous Systems with Failures; Checkpointing and Rollback Recovery: Introduction – Background and Definitions – Issues in Failure Recovery – Checkpoint-based Recovery – Coordinated Checkpointing Algorithm - Algorithm for Asynchronous Checkpointing and Recovery.

Total Lecture Hours-60

COURSE OUTCOME

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

1. Solve synchronization and state consistency problems
2. Use resource sharing techniques in distributed systems
3. Apply working model of consensus and reliability of distributed systems
4. Explain the fundamentals of cloud computing
5. Analyze the consensus and recovery

TEXT BOOKS

1. Kshemkalyani Ajay D, Mukesh Singhal, "Distributed Computing: Principles, Algorithms and Systems", Cambridge Press, 2011.
2. Mukesh Singhal, Niranjana G Shivaratri, "Advanced Concepts in Operating systems", Mc- Graw Hill Publishers, 1994.

REFERENCE BOOK(S)

1. George Coulouris, Jean Dollimore, Time Kindberg, "Distributed Systems Concepts and Design", Fifth Edition, Pearson Education, 2012.
2. Pradeep L Sinha, "Distributed Operating Systems: Concepts and Design", Prentice Hall of India, 2007.
3. Tanenbaum A S, Van Steen M, "Distributed Systems: Principles and Paradigms", Pearson Education, 2007.

E-RESOURCES

1. <https://www.datacamp.com/blog/distributed-computing>
2. <https://www.geeksforgeeks.org/what-is-distributed-computing/>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
C01	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
C02	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
C03	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
C04	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
C05	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)

Unit: 1 The Multidisciplinary nature of environmental studies Definition, scope and importance.

Need for public awareness (2 lectures)

Unit: 2 Natural Resources:

Renewable and non-renewable resources:

Natural resources and associated problems.

a) Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction,

mining, dams and their effects on forests and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought,

conflicts over water, dams benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using

mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and overgrazing,

effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case

studies.

e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use

of alternate energy sources. Case studies.

f) Land resources: Land as a resources, land degradation, man induced Landslides, soil erosion

and desertification. (8 lectures)

Unit: 3 Ecosystems

□ Role of an individual in conservation of natural resources.

- Equitable use of resources for sustainable lifestyles

- Concept of an ecosystem.

- Structure and function of an ecosystem.

- Producers, consumers and decomposers

- Energy flow in the ecosystem

- Ecological succession.

- Food chains, food webs and ecological pyramids

- Introduction, types, characteristic features, structure and function of the following ecosystem:-

- a. Forest ecosystem

- b. Grassland ecosystem

- c. Desert ecosystem

- d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries) (6 lectures)

Unit: 4 Biodiversity and its conservation

- Introduction – Definition : Genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man- wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Biological Diversity Act 2002/ BD Rules, 2004 (8 lectures)

Unit: 5 Environmental Pollution

Definition

Causes, effects and control measures of :

- a. Air Pollution
- b. Water Pollution
- c. Soil Pollution
- d. Marine Pollution
- e. Noise pollution
- f. Thermal Pollution
- g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

Role of an individual in prevention of pollution

Pollution case studies

Disaster management: floods, earthquake, cyclone and landslides.

III-Effects of Fireworks: Firework and Celebrations, Health Hazards,

Types of Fire, Firework and Safety (8 lectures)

Unit: 6 Social Issues and the Environment

- From Unsustainable to Sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation of people; its problems and concerns.

Case studies

- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.
- Issues involved in enforcement of environmental legislation

- Public awareness.

Unit: 7 Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights - Value Education
- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case studies.

Unit: 8 Field Work

Visit to a local area to document environmental assets-river / forest/ grassland/ hill / mountain

REFERENCE BOOK(S)

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt Ltd, Ahamedabad – 380013, India,
E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB) 5. Cunningham, W.P.Cooper,
T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security.Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA

(M) Magazine (R) Reference (TB) Textbook

23. [http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20](http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules,%202004.pdf)

[Rules,%202004.pdf](http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules,%202004.pdf).

SEMESTER-VI

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE



Semester: VI-CC-VIII: PROGRAMMING WITH .NET

Ins. Hrs. /Week:6

Course Credit:4

Course Code: U24CS613

UNIT-I INTRODUCTION

(20 Hours)

Overview of .NET framework: Common Language Runtime (CLR), Framework Class Library- C# Fundamentals: Primitive types and Variables – Operators - Conditional statements -Looping statements – Creating and using Objects – Arrays – String operations.

UNIT-II OVERVIEW OF ASP.NET

(18

Hours)

Introduction to ASP.NET - IDE-Languages supported Components -Working with Web Forms – Web form standard controls: Properties and its events – HTML controls - List Controls: Properties and its events.

UNIT-III CONTROLS

(20 Hours)

Rich Controls: Properties and its events – validation controls: Properties and its events – File Stream classes - File Modes – File Share – Reading and Writing to files – Creating, Moving, Copying and Deleting files – File uploading.

UNIT-IV OVERVIEW OF ADO.NET

(19 Hours)

ADO.NET Overview – Database Connections – Commands – Data Reader - Data Adapter - Data Sets - Data Controls and its Properties – Data Binding

UNIT-V GRID VIEW CONTROL

(19 Hours)

Deleting, editing, Sorting and Paging. XML classes – Web form to manipulate XML files - Website Security - Authentication - Authorization – Creating a Web application.

Total Lecturing Hours-90

COURSE OUTCOME

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

- 1 To identify and understand the goals and objectives of the .NET framework and ASP.NET with C# language.
- 2 To develop web application using various controls.
- 3 To analyze C# programming techniques in developing web applications.
- 4 To assess a Web application using Microsoft ADO.NET.
- 5 To develop a software to solve real-world problems using ASP.NET

TEXT BOOKS

1. Svetlin Nakov,VeselinKolev& Co, Fundamentals of Computer Programming with C#,Faber publication, 2019.
2. Mathew, Mac Donald, The Complete Reference ASP.NET, Tata McGraw-Hill ,2015.
3. Beginning C# and .NET” by Benjamin Perkins Simple, clear guide for beginners to learn C# and .NET.
4. “Head First C#” by Andrew Stellman & Jennifer Greene Visual, beginner-friendly learning of C# programming.

REFERENCE BOOK(S)

1. Herbert Schildt, The Complete Reference C#.NET, Tata McGraw-Hill,2017.
2. Kogent Learning Solutions, C# 2012 Programming Covers .NET 4.5 Black Book, Dreamtech pres,2013.
3. Anne Boehm, Joel Murach, Murach’s C# 2015, Mike Murach& Associates Inc. 2016.
4. DenielleOtey, Michael Otey, ADO.NET: The Complete reference, McGraw Hill,2008.
5. Matthew MacDonald, Beginning ASP.NET 4 in C# 2010, APRESS,2010.

E-RESOURCES

1. <https://dotnet.microsoft.com/en-us/learn>
2. <https://learn.microsoft.com/en-us/dotnet/samples-and-tutorials/>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PSO	PSO	PSO	PSO	PSO	PSO	PSO
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),
SUNDARAKKOTTAI, MANNARGUDI - 614016.
(For the candidates admitted in the academic year 2024 - 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: VI-CP-VI: PROGRAMMING WITH .NET LAB

Ins. Hrs. /Week: 6

Course Credit: 4

Course Code: U24CS614P

EXERCISES

1. Create an exposure of Web applications and tools
2. Implement the HTML Controls
3. Web application using Web controls.
4. Web application using List controls.
5. Web Page design using Rich control. Validate user input using Validation controls.
6. Web application using Data Controls.
7. Data binding with Web controls
8. Data binding with Data Controls.
9. Database application to perform insert, update and delete operations.
10. Database application using Data Controls to perform insert, delete, edit, paging and sorting operation.

COURSE OUTCOME

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

1. To identify and understand the goals and objectives of the .NET framework and ASP.NET with C# language.
2. To develop web application using various controls.
3. To analyze C# programming techniques in developing web applications.
4. To assess a Web application using Microsoft ADO.NET.
5. To develop a software to solve real-world problems using ASP.NET

Total Lecturing Hours-90

TEXT BOOKS

1. Svetlin Nakov, Veselin Kolev & Co, Fundamentals of Computer Programming with C#, Faber publication, 2019.
2. Mathew, Mac Donald, The Complete Reference ASP.NET, Tata McGraw-Hill, 2015.

E-RESOURCES

1. <https://dotnet.microsoft.com/en-us/learn>
2. <https://learn.microsoft.com/en-us/dotnet/samples-and-tutorials/>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE



Semester: VI EC III (A): INTRODUCTION TO DATA SCIENCE

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE63A

UNIT-I INTRODUCTION TO DATA SCIENCE

(12 Hours)

- Big Data and Data Science hype – getting past the hype - Datafication - Current landscape of perspectives - Skill sets needed - Statistical Inference - Exploratory Data Analysis and the Data Science Process - Basic tools (plots, graphs and summary statistics) of EDA – Applications of Data Science - Data Science in Business - Business Intelligence vs Data Science – Data Analytics Life Cycle - Machine Learning

UNIT-II INTRODUCTION TO PYTHON

(12 Hours)

Features of Python - How to Run Python – Identifiers- Reserved Keywords- Variables - Comments in Python - Indentation in Python - Multi-Line Statements- Input, Output and Import Functions- Operators. Data Types and Operations: Numbers -Strings -List -Tuple - Set -Dictionary - Mutable and Immutable Objects - Data Type Conversion. Flow Control: Decision Making-Loops-Nested Loops- Control Statements- Types of Loops-List Comprehensions-Set Comprehensions- Dictionary Comprehensions-Nested Dictionaries.

UNIT-III FUNCTION

(12 Hours)

Function Definition - Function Calling - Function Arguments - Anonymous Functions (Lambda Functions) - Recursive Functions - Modules and Packages: Built-in Modules - Creating Modules - import Statement- Namespaces and Scope - The dir() function - The reload() function -Packages in Python - Date and Time Modules – Numpy Libraries and Data Manipulation Using Pandas

UNIT-IV FILE HANDLING AND OBJECT ORIENTED PROGRAMMING (12 Hours)

- Opening a File-Closing a File - Writing to a File - Reading from a File - File Methods - Renaming a File - Deleting a File - Directories in Python. Regular Expressions. Class Definition - Creating Objects - Built-in Attribute Methods - Built-in Class Attributes - Destructors in Python - Encapsulation - Data Hiding – Inheritance- Method Overriding – Polymorphism - Exception Handling

UNIT-V DATABASE PROGRAMMING AND VISUALIZATIONS

(12 Hours)

- Connecting to a Database - Creating Tables - INSERT Operation - UPDATE Operation - DELETE Operation - READ Operation - Transaction Control - Disconnecting from a Database - Exception Handling in Databases - GUI Programming - CGI Programming- Data Visualizations using Matplotlib – histograms, bar charts, pie charts.

Total Lecturing Hours-60

COURSE OUTCOME

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

1. To explain the basic concepts of data science and its application
2. To demonstrate Control Statements and Looping Statements
3. To create and illustrate Numpy Libraries
4. Apply Exception Handling Techniques
5. To Create and manipulate Database

TEXT BOOKS

1. Doing Data Science, Straight Talk From The Frontline, Cathy O'Neil and Rachel Schutt, O'Reilly (2014)
2. Big Data Analytics, paperback 2nd ed., Seema Acharya, SubhasiniChellappan, Wiley
3. Dr. Jeeva Jose (2018) ,Taming Python By Programming, Khanna Publishers
4. Jake Vanderplas, Python Data Science Handbook: Essential Tools for Working with Data 1st Edition.

REFERENCE BOOK(S)

1. LjubomirPerkovic(2012),Introduction to Computing Using Python: An Application DevelopmentFocus, John Wiley & Sons
2. John V Guttag(2013), Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press.
3. Kenneth A. Lambert(2012), Fundamentals of Python: First Programs, C engage Learning

E-RESOURCES

1. <http://www.geeksforgeeks.org/introduction-to-data-science/>
2. <https://techcommunity.microsoft.com/blog/educatordeveloperblog/introducing-data-science-for-beginners/2796770>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
C01	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
C02	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
C03	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
C04	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
C05	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE



Semester: VI EC - III(B) : SOFTWARE TESTING

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE63B

UNIT I SDLC MODELS & WHITE BOX TESTING (12 Hours)

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing –Challenges in White-Box Testing.

UNIT II BLACK BOX & INTEGRATION TESTING TECHNIQUES (12 Hours)

Black-Box Testing - Challenges in White Box Testing -Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase Testing – Scenario Testing – Defect Bash.

UNIT III SYSTEM AND ACCEPTANCE TESTING (12 Hours)

system Testing Overview– Functional versus Non-functional Testing – Functional testing - Nonfunctional Testing – Acceptance Testing – Summary of Testing Phases.

UNIT IV PERFORMANCE TESTING & REGRESSION TEST (12 Hours)

Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing– Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT V TEST PLANNING, MANAGEMENT & METRICS (12 Hours)

Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

Total Lecturing Hours-60

COURSE OUTCOME

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

1. To explain the basic concepts of SDLC
2. To understand challenges in software testing
3. To analyze the performance testing
4. To analyze the test planning management
5. To apply the project metrics

TEXT BOOK

1. Software Testing Principles and Practices –Srinivasan Desikan & Gopalswamy Ramesh, Pearson Education, 2014

REFERENCE BOOK

1. Foundations of Software Testing, Aditya P. Mathur, Pearson Education, 2013

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)**M-Medium (2)****L-Low (1)**



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),
SUNDARAKKOTTAI, MANNARGUDI – 614016.
(For the candidates admitted in the academic year 2024– 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: VI-EC III(C) : MACHINE LEARNING

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE63C

UNIT-I INTRODUCTION MACHINE LEARNING

(12 Hours)

Difference between AI, Machine Learning and Big data. Supervised and unsupervised learning, parametric vs non-parametric models, parametric models for classification and regression- Linear Regression, Logistic Regression, Naïve Bayes classifier, simple non-parametric classifier-K-nearest neighbour, support vector machines

UNIT-II NEURAL NETWORKS AND GENETIC ALGORITHMS

(12 Hours)

Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.

Unit-III BAYESIAN AND COMPUTATIONAL LEARNING

(12 Hours)

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model. **Unit-IV**

INSTANT BASED LEARNING

(12 Hours)

K- Nearest Neighbour Learning – Locally weighted Regression – Radial Basis Functions – Case Based Learning.

Unit-V ADVANCED LEARNING

(12 Hours)

Recommendation systems – opinion mining, sentiment analysis. Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning.

Total Lecturing Hours-60

COURSE OUTCOME

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

1. Explain machine learning
2. Apply machine learning concepts in various domains
3. Implement supervised, unsupervised learning techniques
4. Differentiate supervised and unsupervised learning techniques
5. Create and evaluate models

TEXT BOOKS

1. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, —Machine Learning, Pearson Education.(Unit1: Chapter1:4,1.5,1.7,1.9; Unit 2: Chapter 6; Unit 3: Chapter 7, 8, 10; Unit 4 Chapter 9 (9.1,9.4), Unit 5: Chapter 3;)
2. Ethem Alpaydin,"Introduction to Machine Learning", MIT Press, Prentice Hall of India, Third Edition 2014. (Unit2: Chapter 7, Chapter 15)
3. Tariq Rashid, "Make your own neural network", Create Space Independent Publishing Platform, US 2016, ISBN:978-1-5308-2660-5 (Unit1, Part1)

REFERENCE BOOK(S)

1. Shai Shalev-Shwartz, Shai Ben-David, — Understanding Machine Learning: From Theory to Algorithms, Cambridge University Press.
2. T. Hastie, R. Tibshirani and J. Friedman, "Elements of Statistical Learning", Springer.
3. Charu C. Aggarwal, "DATA CLUSTERING Algorithms and Applications", CRC Press, 2014.
4. C. Bishop, "Pattern Recognition and Machine Learning", Springer.
5. Sebastian Raschka and Vahid Mirjalili, "Python Machine Learning", Packt Publishing, Third Edition, 2019

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: VI EC- IV(A) INFORMATION SECURITY

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE64A

UNIT-I INTRODUCTION TO INFORMATION SECURITY

(12 Hours)

Security mindset, Computer Security Concepts (CIA), Attacks, Vulnerabilities and protections, Security Goals, Security Services, Threats, Attacks, Assets, malware, program analysis and mechanisms

UNIT-II THE SECURITY PROBLEM IN COMPUTING

(12 Hours)

The meaning of computer Security, Computer Criminals, Methods of Defense. Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption

UNIT-III SYMMETRIC AND ASYMMETRIC CRYPTOGRAPHIC TECHNIQUES (12 Hours)

DES, AES, RSA algorithms .Authentication and Digital Signatures: Use of Cryptography for authentication, Secure Hash function, Key management – Kerberos.

UNIT-IV PROGRAM SECURITY

(12 Hours)

Non-malicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-of-use Errors, Viruses, Trapdoors, Salami attack, Man-in-the-middle attacks, Covert channels. File protection Mechanisms, User Authentication Designing Trusted O.S: Security policies, models of security, trusted O.S design, Assurance in trusted O.S. Implementation examples.

UNIT-V SECURITY IN NETWORKS

(12 Hours)

Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security. Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction.

Total Lecturing Hours-60

COURSE OUTCOME

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

1. Understand network security threats, security services, and countermeasures
2. Understand vulnerability analysis of network security Acquire background on hash functions, authentication, firewalls, intrusion detection techniques.
3. Gain hands-on experience with programming and simulation techniques for security protocols.
4. Apply methods for authentication, access control, intrusion detection and prevention.

TEXT BOOKS

1. Security in Computing, Fourth Edition, by Charles P. Pfleeger, Pearson Education
2. Cryptography And Network Security Principles And Practice, Fourth or Fifth Edition, William Stallings, Pearson

REFERENCE BOOK(S)

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM.Arthur Conklin, Greg White, TMH

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: VI EC IV(B) INTERNET OF THINGS

Ins. Hrs. /Week:4

Course Credit:3

Course Code: 24CSE64B

UNIT-I INTRODUCTION

(12 Hours)

History of IoT - Importance of Internet of Things – IoT devices, connectivity and system – Technologies behind Internet of Things - IoT applications – benefits of IoT to organizations - pros and cons of IoT – IoT standards and frameworks – IoT security and privacy issues.

UNIT-II IOT MARKETS AND TRENDS

(12 Hours)

Introduction to Internet of Things - Surveying IoT Markets and Trends - Identifying the Wireless Standards That Enable the IoT- The goal: Interoperability - CHIP to the rescue - Ultra-wideband - 5G and Wi-Fi 6/6E

UNIT-III IOT ARCHITECTURE AND TECHNOLOGY PROTOCOLS

(12 Hours)

IoT Architecture and Technology Protocols - Digging into the IoT Ecosystem - Examining the IoT Architecture - IoT Protocols

UNIT-IV THE SMART HOME

(12 Hours)

Surveying Today's Smart Home - The Mesh Network/One Pod Per Room - Overcoming the Challenges – Interoperability - RF interference - Maintaining a seamless, energy-efficient, and reliable connection - Creating an ease-of-use self-management IoT network - Network security and privacy - Power consumption - Importance of Always-on Connectivity

UNIT-V NEXT-GENERATION IOT OPPORTUNITIES AND USE CASES

(12 Hours)

Next-Generation Smart Home- Manufacturing/Industry 4.0 – Transportation - Retail - Smart Energy - Healthcare - Smart Cities – Agriculture

Total Lecturing Hours-60

COURSE OUTCOME

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

1. Explore the fundamentals of IoT.
2. Identify IoT markets and trends
3. Describe IoT Architecture and protocols.
4. Understand the challenges in IoT.
5. Identify opportunities in IoT.

TEXT BOOKS

1. Vijay Madisetti and Arshdeep Bahga, —Internet of Things: (A Hands-on Approach), Universities Press (INDIA) Private Limited 2014, 1st Edition. (Unit1: Chapter1).
2. Gillis, Alexander, "What is internet of things (IoT)?" IOT Agenda, 2021 (Unit1).
3. Cees Link, "Internet of Things For Dummies", Qorvo 2nd Special Edition, John Wiley & Sons, Inc., 2021 (Unit2: Chapter1; Unit3: Chapter2; Unit4: Chapter3; Unit5: Chapter4).

REFERENCE BOOK(S)

1. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things", Springer, 2011.
3. David Easley and Jon Kleinberg, "Networks, Crowds, and Markets: Reasoning About a highly Connected World", Cambridge University Press, 2010.
4. Olivier Hersent, Omar Elloumi and David Boswarthick, "The Internet of Things: Applications to the Smart Grid and Building", Wiley, 2012.
5. Jamil Y. Khan, Mehmet R. Yuce, Internet of Things (IoT): Systems and Applications. Singapore, Jenny Stanford Publishing, 2019.

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
C01	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
C02	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
C03	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
C04	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
C05	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

Semester: VI EC IV (C) MOBILE APPLICATION DEVELOPMENT

Ins. Hrs. /Week:4

Course Credit:3

Course Code: U24CSE64C

UNIT - I INTRODUCTION TO ANDROID

(6 Hours)

The Android Platform-Android SDK-Eclipse Installation- Android Installation, building you First Android application-Understanding Anatomy of Android Application-Android Manifest file

UNIT - II ANDROID APPLICATION DESIGN

(6 Hours)

Android Application Design Essentials: Anatomy of an Android applications- Android terminologies-Application Context- Activities-Services, Intents, Receiving and Broadcasting Intents- Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT - III USER INTERFACE DESIGN

(6 Hours)

Android User Interface Design Essentials: User Interface Screen elements-Designing User Interfaces with Layouts-Drawing and Working with Animation.

UNIT - IV ANDROID APPLICATIONS

(6 Hours)

Testing Android applications-Publishing Android application-Using Android preferences-Managing Application resources in a hierarchy-working with different types of resources.

UNIT - V ANDROID APIS

(6 Hours)

Using Common Android APIs: Using Android Data and Storage APIs-Managing data using Sqlite-Sharing Data between Applications with Content Providers-Using Android Networking APIs-Using Android Web APIs-Using Android Telephony APIs-Deploying Android Application to the World.

Total Lecturing Hours-60 Hours

COURSE OUTCOME

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

1. Identify various concepts of mobile application programming in Android platform
2. Implement the business logic in an app with java
3. Understand Android User Interface Design with XML
4. Know about Common Android APIs
5. Deploy applications to the Android marketplace for distribution.



(AUTONOMOUS),
SUNDARAKKOTTAI, MANNARGUDI – 614016.
(For the candidates admitted in the academic year 2024 – 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

TEXT BOOKS

1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2011.
2. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd, 2010

REFERENCE BOOK(S)

1. Mark L Murphy, “Beginning Android3”, Apress Publications, 2011. Bill Phillips, Chris Stewart, Kristin Marsicano, Brian Gardner, “Android Programming”, Big Nerd Ranch, 2019.
2. Barry Burd, John Paul Mueller, “Android Application Development All in one for Dummies”, Wiley Publications, 2020.
3. Namrata Bandekar, Darryl Bayliss, Fuad Kamal, “Android Apprentice (Fourth Edition) Beginning Android Development with Kotlin”, R R BOWKER LLC, 2021.

E-RESOURCES

1. <https://www.slideshare.net/tirupathinews/mobile-application-development-ppt>
2. <https://www.slideshare.net/slideshow/android-app-development-ppt/238718453>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

PART-IV

VALUE EDUCATION

Ins. Hrs. /Week:2

Course Credit:2

Course Code:24UGVED

UNIT- I: PHILOSOPHY OF LIFE AND SOCIAL VALUES:

Human Life on Earth (Kural 629) -Purpose of Life (Kural 46) -Meaning and Philosophy of Life (Kural 131, 226) -Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).

UNIT-II HUMAN VALUES AND CITIZENSHIP

Aim of education and value education: Evolution of value oriented education, Concept of Human values: types of Values- Character Formation – Components of Value education- A P J Kalam's ten points for enlightened citizenship- The role of media in value building

UNIT-III VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT:

Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal brotherhood - Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith -Religious Values: Tolerance, wisdom, character - Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same- National Integration and International Understanding.

UNIT -IV YOGA AND HEALTH:

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

UNIT V : HUMAN RIGHTS:

Concept of Human Rights: Indian and international perspectives-Evolution of Human Rights- definitions under Indian and International documents - Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty and Dignity- Right to equality- Right against exploitation- Cultural and Educational Right-Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children – Peace and harmony.

UNIT - VI CURRENT CONTOURS: (for continuous internal assessment only):

BOOKS FOR REFERENCES

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. Leah Levin, Human Rights, NBT, 1998
3. V.R. Krishna Iyer, Dialectics and Dynamics of Human Rights in India, Tagore Law Lectures.
4. Yogic Therapy - Swami Kuvalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
5. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran,
Prem Kalyan Publications, Sedapatti, 1999.
6. Grose. D. N - "A text book of Value Education' New Delhi (2005)
7. Gawande . EN - "Value Oriented Education" - Vision for better living. New Delhi (2002) Saruptsons
8. Brain Trust Aliyar- "Value Education for Health, Happiness and Harmony" Erode (2004) Vethathiri publications

COURSE OUTCOME

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

1. Apply the values in thirukural to be peaceful, dutiful and responsible in family and society
2. Develop character formation and sense of citizenship
3. Be secular, self-control, sincere, respectful and moral.
4. Master yoga, asana and meditation to promote mental health
5. Be attitudinal to follow the constitutional rights

E-RESOURCES

1. <https://www.learnpick.in/prime/documents/ppts/details/42/structures-in-c>
2. <https://cutt.ly/pbhDNEx>
3. <http://www.d.umn.edu/~rmaclin/cs1622/Chapter09-10/Chapter09-10.PPT>



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),
SUNDARAKKOTTAI, MANNARGUDI – 614016.
(For the candidates admitted in the academic year 2024 – 2025)
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: VI-PART-IV
APTITUDE AND REASONING SKILLS FOR COMPETITIVE EXAMINATIONS
Ins. Hrs. /Week:2 Course Credit:2 Course Code:U24PCCS61

UNIT-I INTRODUCTION TO COMPUTER SYSTEM AND ARCHITECTURE

Number System: Digital Codes, Weighted Binary Code, Non-Weighted Binary Code, Alphanumeric Code- Machine Language, Assembly Language, Assembler, Program Loops, Subroutines- Memory Hierarchy.

UNIT-II DATABASE SYSTEM CONCEPTS AND ARCHITECTURE

Data Models, Schemas and Instances, Three-Schema Architecture and Data Independence. Entity Relationship Diagrams, Relational Model.

UNIT-III BASICS OF OPERATING SYSTEMS

Operating System Structure, Operations and Services, System Calls- Process Management-Threads-CPU Scheduling-Deadlocks-Memory Management.

UNIT-IV INTRODUCTION TO DATA STRUCTURES

Definition – Data Structures - Types of data structures- Abstract data types, Arrays and their Applications, Stacks, Queues, Priority Queues, Linked Lists.

UNIT-V CYBER CRIME

Introduction to Cyber Crime, Malware type, Kinds of Cyber Crime. Cyber Security Techniques: Authentication, Encryption, Digital Signatures, Antivirus, Firewall, Steganography.

COURSE OUTCOME

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

1. Identify various concepts of computer system architecture
2. Implement the ER Model to Database applications
3. Understand basics of Operating systems
4. Know about Common Data Structures
5. Deploy the Cyber security techniques.

TEXT BOOKS

1. M. Moris Mano (2006), Computer System Architecture, 3rd edition, Pearson/PHI, India.
2. Silberschatry, Korth, Sundarshan, "Database system Concepts", Fourth Edition, Mc GrawHill Higher Education
3. Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2004

REFERENCE BOOK (S)

1. E.Horowitz, S.Sahni and Susan Anderson Freed, "Fundamental Data Structures in C", 2ed, Orient BlackSwan Publisher, 2009.
2. Cryptography and Network Security: Principles and Practice (6th Edition), William Stallings, Prentice Hall Press, 2013.

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)**M-Medium (2)****L-Low (1)**



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI - 614016.

(For the candidates admitted in the academic year 2024 - 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

PART -V

GENDER STUDIES

Ins. Hrs. /Week:1

Course Credit:1

Course Code: 24UGGS

UNIT - I

Concepts of Gender: Sex – Gender – Biological Determinism – Patriarchy – Feminism – Gender Discrimination – Gender Division of labour – Gender Stereotyping – Gender Sensitivity – Gender Equity – Equality – Gender Mainstreaming - Empowerment.

UNIT - II

Women's Studies vs Gender Studies : UGC's Guidelines – VII to XI Plans – Gender Studies : Beijing Conference and CEDAW – Exclusiveness and Inclusiveness.

UNIT - III

Areas of Gender Discrimination : Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Policies and Planning .

UNIT - IV

Women Development and Gender Empowerment : Initiatives – International Women's Decade – International Women's Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies .

UNIT - V

Women's Movements and Safeguarding Mechanism : In India National /State Commission for Women(NCW) – All Women Police Station – Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines – Maternity Benefit Act – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73rd and 74th Amendment for PRIS

REFERENCE BOOK(S)

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited 2004
3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993
4. Pernau Margrit, Ahmad Imtiaz, Reifeld Hermut (ed.,)Family and Gender : Changing Values in Germany and India ,New Delhi :Sage Publications,2003
5. Agarwal Bina, Humphries Jane and Robeyns Ingrid(ed.,) Capabilities , Freedom , and Equality: Amartya Sen's Work from a Gender Perspective,New Delhi : Oxford University Press ,2006
6. Rajadurai. S.V,Geetha.V,Themes in Caste Gender and Religion, Tiruchirappalli : Bharathidasan University ,2007
7. Misra Geetanjali, Chandiramani Radhika (ed.,) Sexuality , Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi : Sage Publication ,2005
8. Rao Anupama (ed.,) Gender &Caste : Issues in Contemporary Indian Feminism, New Delhi : Kali for Women, 2003
9. Saha Chandana , Gender Equity and Gender Equality : Study of Girl Child in Rajasthan , Jaipur: Rawat Publication ,2003.
10. Krishna Sumi, (ed.,),Livelihood and Gender : Equity in Community Resource Management, New Delhi : Sage Publication ,2004
11. Pludi.A Michele(ed.,) praeger Guide to the Psychology of Gender ,London : Praeger Publisher ,2004
12. Wharton .S Amy , The Sociology of Gender : An Introduction to Theory and Research , USA : Blackwell Publishing ,2005
13. Mohanty Manoranjan(ed.,) Class ,Caste ,Gender : Readings in Indian Government and Politics – 5,New Delhi : Sage Publications ,2004.
Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication, 2000

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	2	2	3	2	3	2	2	3	2	2	3	3	3	1
CO2	3	1	2	3	3	2	2	3	3	3	2	2	3	2	1	3	3
CO3	2	3	3	2	2	3	3	2	3	2	3	3	2	2	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	2	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	2	3	2	2	3	3	2	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)

VALUE ADDED COURSE

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2024 – 2025)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE



SEMESTER -V VAC-III : FUNDAMETALS OF ICT SKILLS

Ins. Hrs. /Week:2

Course Credit:2

Course Code: U24CSVA53

UNIT-I INTRODUCTION TO COMPUTER SYSTEM

(6 HOURS)

Basic components and functions of a computer-Understanding hardware and software-Operating systems and their roles.

UNIT-II WORD PROCESSING

(6 HOURS)

Creating and formatting documents-Inserting tables, images, and other elements-Using advanced features like mail merge.

UNIT-III SPREADSHEETS

(6 HOURS)

Data entry and formatting-Using formulas and functions-Creating charts and graphs.

UNIT-IV PRESENTATION TOOLS

(6 HOURS)

Designing slideshows-Incorporating multimedia elements-Appling animations and transitions.

UNIT-V BASICS OF INTERNET AND EMERGING TECHNOLOGIES (6 HOURS)

Understanding the internet and web browsers- Exploring emerging technologies like AI and IoT.

Total Lecturing Hours-30 Hours

COURSE OUTCOME

1. Understand basic concepts of Information and Communication Technology
2. Use word processing tools to create professional documents
3. Utilize spreadsheet tools for data entry, analysis, and visualization
4. Design and deliver presentations using presentation software
5. Apply internet tools for communication and information access

TEXT BOOKS

1. Nirali Prakashan – Fundamentals of ICT (2023 Edition)
2. Tech-Neo Publication – Fundamentals of ICT (2023 Edition)

REFERENCE BOOK

1. Target Publications & Tech-Neo Publications – Fundamentals of ICT (2023 Edition)