

**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.**



**M.Sc., INFORMATION TECHNOLOGY**

**LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK(CBCS-LOCF)**

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

**PROGRAMME CODE**

**2PSINT**



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

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**Institution SUNDARAKKOTTAI, MANNARGUDI-614016.**

**TAMILNADU, INDIA.**

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## **M.Sc., INFORMATION TECHNOLOGY CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)**

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

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### **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.

**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.

### **Postgraduate Programme:**

**Programme Pattern:** The Post Graduate degree programme consists of **FIVE** vital components. They are as follows:

- Part –A : Core Course (Theory, Practicals) Core Industry Module, Core Project
- Part-B (i) : Elective courses
- Part-B (ii) : Non Major Elective, Skill Enhancement course, Professional Competency course
- Part-B (iii) : Internship
- Part –C : Extension activity

### **EXAMINATION**

#### **Continuous Internal Assessment (CIA):**

#### **PG - Distribution of CIA Marks**

**Passing Minimum: 50 %**

Assignments – 3 = 30%

Tests- 2= 50%

Seminar=10 %

Attendance= 10 %

#### **Question Paper Pattern**

**Part A:** includes two subsections

**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/Analysing	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	
<b>END SEMESTER EXAMINATIONS (ESE)</b>	20	25		30			<b>75</b>
<b>Continuous Internal Assessment (CIA)</b>	20	25		30			<b>75</b>

### QUESTION PATTERN FOR END SEMESTER EXAMINATION/ Continuous Internal Assessment

PART	MARKS
<b>PART –A I.</b> (No choice ,One Mark) <b>TWO</b> questions from each unit <b>II.</b> (No choice, Two Mark) <b>ONE</b> question from each unit	(10x1=10) (5x2=10)
<b>PART –B</b> (Either/ or type,5-Marks) <b>ONE</b> question from each unit	(5x5=25)
<b>PART –C</b> (3 out of 5) (10Marks) <b>ONE</b> question from each unit	(3x10=30)
<b>Total</b>	<b>75</b>

**BLUE PRINT OF QUESTION PAPER FOR END SEMESTER EXAMINATION**

<b>DURATION: 3.00 Hours.</b>		<b>Max Mark :75</b>						
<b>K-LEVELS</b>		<b>K1</b>	<b>K2</b>	<b>K3</b>	<b>K4</b>	<b>K5</b>	<b>K6</b>	<b>Total Marks</b>
<b>PART</b>								
<b>PART –A</b> (One Mark, No choice) (10x1=10) (2-Marks, No choice) (5x2=10)		10						<b>10</b>
		10						<b>10</b>
<b>PART –B</b> (5-Marks) (Either/or type) (5x5=25)			5	10	10			<b>25</b>
<b>PART –C</b> (10 Marks) (3 out of 5) (3x10=30) Courses having only <b>K5, K6</b> levels, K5 level- 3 Questions, K6 level- 2 Questions (One K6 level question is compulsory)						20	10	<b>30</b>
<b>Total</b>		<b>20</b>	<b>05</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>10</b>	<b>75</b>

## 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:

$\text{GPA} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}$	$\text{WAM(Weighted Average Marks)} = \frac{\sum_{i=1}^n C_i M_i}{\sum_{i=1}^n C_i}$
<p>Where,</p> <p style="text-align: center;"> <math>C_i</math> is the Credit earned for the Course <math>i</math>  <math>G_i</math> is the Grade Point obtained by the student for the Course <math>i</math>  <math>M_i</math> is the marks obtained for the course <math>i</math> and  <math>n</math> is the number of Courses <b>Passed</b> in that semester.         </p>	

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

### CLASSIFICATION OF FINAL RESULTS:

- i. The classification of final results shall be based on the CGPA, as indicated in Table-2.
- ii. For the purpose of Classification of Final Results, the candidates who earn the CGPA 9.00 and above shall be declared to have qualified for the Degree as ‘Outstanding’. Similarly the candidates who earn the CGPA between 8.00 and 8.99, 7.00 and 7.99, 6.00 and 6.99 and 5.00 and 5.99 shall be declared to have qualified for their Degree in the respective programmes as ‘Excellent’, ‘Very Good’, ‘Good’, and ‘Above Average’ respectively.
- iii. Absence from an examination shall not be taken an attempt.

**Table- 1: Grading of the Courses**

<b>Marks Range</b>	<b>Grade Point</b>	<b>Corresponding Grade</b>
90 and above	<b>10</b>	<b>O</b>
80 and above and below 90	<b>9</b>	A+
70 and above and below 80	<b>8</b>	<b>A</b>
60 and above and below 70	<b>7</b>	<b>B+</b>
50 and above and below 60	<b>6</b>	<b>B</b>
Below 50	<b>NA</b>	<b>R</b> <b>A</b>

**NA- Not Applicable, RA- Reappearance**

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-2: Final Result**

<b>CGPA</b>	<b>Corresponding Grade</b>	<b>Classification of Final Result</b>
9.00 and above	<b>O</b>	<b>Outstanding</b>
8.00 to 8.99	A+	<b>Excellent</b>
7.00 to 7.99	<b>A</b>	<b>Very Good</b>
6.00 to 6.99	<b>B+</b>	<b>Good</b>
5.00 to 5.99	<b>B</b>	<b>Above Average</b>

\* The candidates who have passed in the first appearance and within the prescribed duration of the PG 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 M.Sc.,DEGREE PROGRAMMES

PO.No	Programme Outcomes <i>(Upon completion of the M.Sc., Degree Programme, the Post graduate will be able to)</i>
PO-1	<b>Disciplinary Knowledge:</b> demonstrate in-depth knowledge and understanding of theories, policies, and practices in one or more disciplines that form a part of a Post Graduate program of study in Master of Science.
PO-2	<b>Critical Thinking and Problem Solving:</b> apply analytic thought to a body of knowledge, analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence, identify relevant assumptions or implications, formulate coherent arguments, critically evaluate practices, policies and theories by following scientific approach to knowledge development: solve problems and extrapolate the same to real life situation
PO-3	<b>Information/digital literacy and Communication Skills:</b> use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources, and use appropriate software for analysis of data: communicate thoughts and ideas analytically and effectively in writing and orally using appropriate media, and present complex information in a clear and concise manner to different groups.
PO-4	<b>Research-related skills:</b> conduct independent inquiry in a chosen scientific discipline, demonstrate sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesizing and articulating; recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; plan, execute and report the results of an experiment or investigation.
PO-5	<b>Scientific reasoning and Reflective Thinking:</b> analyse, interpret and draw conclusions from quantitative/qualitative data and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective; critically and sensibly evaluate life experiences, with self-awareness and reflexivity of both self and society.
PO-6	<b>Multidisciplinary Approach, Innovation and Entrepreneurship:</b> propose novel ideas of interdisciplinary approach in providing better solutions and new ideas for the sustainable developments; identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.
PO-7	<b>Moral and ethical awareness/reasoning:</b> 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, demonstrate the ability to identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights, appreciate environmental and sustainability issues, and adopt objective, unbiased and truthful actions in all aspects of work.
PO-8	<b>Self directed Learning:</b> work independently, identify appropriate resources required for a project, and manage a project till completion.
PO-9	<b>Lifelong Learning:</b> engage in continuous learning for professional growth and development, acquire knowledge and skills, adapt to changing environment and to changing trades and demands of work place through knowledge/skill development/reskilling.
PO-10	<b>Multicultural Competence, Social Interaction and Effective Citizenship:</b> 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, and demonstrate empathetic social concern and equity centred national development

## M.Sc., INFORMATION TECHNOLOGY-PROGRAMME SPECIFIC OUTCOME

<b>PSO No.</b>	<b>Program Specific Outcomes (M.Sc., Information Technology)</b>
<b>PSO1:</b>	Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
<b>PSO2:</b>	Gain critical understanding of hardware and software tools catering to the contemporary needs of IT industry
<b>PSO3:</b>	Design, Develop and test software systems for worldwide network of computer to provide solutions to real world problems.
<b>PSO4:</b>	Apply standard software engineering principles to develop viable solutions for information technology enabled services.
<b>PSO5:</b>	Analyze and recommend the appropriate IT infrastructure required for the implementation of a project.
<b>PSO6:</b>	Implement the business ideas in IT industry through e-commerce and Management information system concepts.
<b>PSO7:</b>	An ability to understand research methods used to collect and analyze data for decision making.



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**SUNDARAKKOTTAI, MANNARGUDI-614016.**

**TAMILNADU, INDIA.**

**M.Sc., INFORMATION TECHNOLOGY**

**COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES BASED  
CURRICULUM FRAMEWORK (CBCS - LOCF)**

(Applicable to the candidates admitted from the academic year 2024-2025)

**ELIGIBILITY:** B.C.A. / B.Sc. Computer Science / B.Sc. Information Technology / B.Sc. Software Development or any other degree (with Mathematics as an allied subject / Major subject) or (Computer Science with Mathematics or Business Mathematics or Statistics at +2 level) of this University or from a recognized University or an examination accepted by the Syndicate as equivalent thereto

Sem	Part	Course	Course Code	Title of the Paper	Ins. Hours / Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
I	Part A	Core Course- I	P24IT101	Open-Source Technologies	6	4	1	-	1	5	3	25	75	100
		Core Course- II	P24IT102	Python programming	6	4	1	-	1	5	3	25	75	100
		Core Practical- I	P24IT103P	Python Programming Lab	6	-	-	6	-	3	3	25	75	100
	Part B(i)	Elective Course- I	P24ITE11A/ P24ITE11B/ P24ITE11C	Mobile Computing/ Compiler Design/ Social Networking	5	5	-	-	-	3	3	25	75	100
		Elective Course- II	P24ITE12A/ P24ITE12B/ P24ITE12C	Internet of Things/ Advanced Data Structures/ Object Oriented Systems Development	5	4	1	-	-	3	3	25	75	100
	Part B (ii)	NME-I	P24NMEIT11	Web Design	2	2	-	-	-	2	-	25	75	100
	<b>TOTAL</b>					<b>30</b>	<b>19</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>21</b>	-	-	-

Sem	Part	Course	Course Code	Title of the Paper	Ins. Hours / Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
II	Part A	Core Course- III	P24IT204	Advanced Database Systems	6	4	1	-	1	5	-	25	75	100
		Core Course - IV	P24IT205	Cryptography and Network Security	6	4	1	-	1	5	-	25	75	100
		Core Practical- II	P24IT206P	RDBMS Lab	6	-	-	6	-	3	-	25	75	100
	Part B(i)	Elective Course- III	P24ITE23A / P24ITE23B / P24ITE23C	Biometrics Techniques/ Digital Watermarking and Steganography/ Digital Image Processing	5	5	-	-	-	3	-	25	75	100
		Elective Course- IV	P24ITE24A / P24ITE24B / P24ITE24C	Human Computer Interaction/ Computer Security and Privacy/ Pervasive Computing	5	4	1	-	-	3	-	25	75	100
	Part B (ii)	NME-II	P24NMEIT22	Multimedia and its Applications	2	2	-	-	-	2	3	25	75	100
	Part B (iii)	Internship/Industrial Activity				-	-	-	-	-	-	-	-	-
				<b>TOTAL</b>	<b>30</b>	<b>19</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>21</b>	-	-	-	<b>600</b>
III	Part A	Core Course-V		Dot Net Programming	6	4	1	-	1	5	3	25	75	100
		Core Course- VI		Advanced Software Engineering	6	4	1	-	1	5	3	25	75	100
		Core Practical -III		Dot Net Programming Lab	6	-	-	6	-	3	3	25	75	100
		Core Industry Module		Data Analytics	5	4	1	-	-	3	3	25	75	100
	Part B (i)	Elective Course- V		Advanced Operating Systems / Intelligent Systems / Research Methodology	5	4	1	-	-	3	3	25	75	100
	Part B (ii)	Skill Enhancement Course		Desk Top Publishing	2	2	-	-	-	2		25	75	100
Part B (iii)	Internship/Industrial Activity				-	-	-	-	-	2	-	-	-	-
<b>TOTAL</b>					<b>30</b>	<b>18</b>	<b>4</b>	<b>6</b>	<b>2</b>	<b>23</b>	-	-	-	<b>600</b>

Sem	Part	Course	Course Code	Title of the Paper	Ins. Hours / Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE	
IV	Part A	Core Course-VII		J2EE Technologies	5	4	1	-		5	-	25	75	100
		Core Course-VIII		Artificial Intelligence and Machine Learning	5	4	1			5	-	25	75	100
		Core Practical-IV		J2EE Technologies Lab	6	-	-	6		3	-	25	75	100
		Core Project		Project with Viva-Voce	8	-	2	6		7	-	25	75	100
	Part B(i)	Elective Course-VI (Industry/ Entrepreneurship)		Virtual and Augmented Reality / Trends in Computing / Introduction to Robotics	4	3	1	-		3	-	25	75	100
	Part B(ii)	Professional Competency Course		Computer Science for SET/NET	2	2	-	-		2	3	25	75	100
	Part C	Extension Activity				-	-	-	-		1	-	-	-
				<b>TOTAL</b>	<b>30</b>	<b>13</b>	<b>5</b>	<b>12</b>		<b>26</b>	-	-	-	<b>600</b>
				<b>GRAND TOTAL</b>	<b>120</b>	-	-	-		<b>91</b>				<b>2400</b>
* Extra Credit				MOOC /SWAYAM/ NPTEL	-	-	-	-		2	-	-	-	-
				Value Added Courses (Atleast one per year)	-	-	-	-		2	-	-	-	-

### **CREDIT DISTRIBUTION FOR M.SC., INFORMATION TECHNOLOGY**

<b>S. No</b>	<b>Part</b>	<b>Subject</b>	<b>Total Credits</b>
<b>1</b>	<b>Part A</b>	Core Course [8 Courses X 5 Credits]	40
<b>2</b>		Core Practical [4 Courses X 3 Credits]	12
<b>3</b>		Core Project Work VIVA VOCE	7
<b>4</b>		Core Industry Module	3
<b>5</b>	<b>Part B (i)</b>	Elective Course [ 6 Courses X 3 Credits]	18
<b>6</b>	<b>Part B (ii)</b>	Non-Major Elective [2 Course X 2 Credits]	4
<b>7</b>		Skill Enhancement Course [1 Courses X 2 Credits]	2
<b>8</b>		Professional Competency Course [1 Course X 2 Credits]	2
<b>9</b>	<b>Part B (iii)</b>	Internship	2
<b>10</b>	<b>Part C</b>	Extension Activity	1
<b>Total Credit</b>			<b>91</b>

Part A component and Part B (i) will be taken into account for CGPA calculation for the postgraduate programme and the other components of Part B and Part C have to be completed during the duration of the programme as per the norms, to be eligible for obtaining the PG degree.

#### **NON-MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT**

<b>Semester</b>	<b>Part</b>	<b>Course</b>	<b>Course Code</b>	<b>Title of the Paper</b>
I	Part B (ii)	NME-I	<b>P24NMEIT11</b>	Web Design
II		NME-II	<b>P24NMEIT22</b>	Multimedia and its Applications

# **SEMESTER - I**



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

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

**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

**Semester: I–CC-I: Open Source Technologies**

**Ins. Hrs./Week:6**

**Course Credit:5**

**Course Code: P24IT101**

**UNIT-I INTRODUCTION**

**(18 Hours)**

Introduction to Open-Source: Open Source, Need and Principles of OSS, Open- Source Standards, Requirements for Software, OSS success, Free Software, Examples, Licensing, Free Vs. Proprietary Software, Free Software Vs. Open- Source Software, Public Domain. History of free software, Proprietary Vs Open- Source Licensing Model, use of Open- Source Software, FOSS does not mean no cost. History: BSD, the Free Software Foundation and the GNU Project.

**UNIT- II OPEN-SOURCE PRINCIPLES AND METHODOLOGY**

**(18 Hours)**

Open-Source History, Open-Source Initiatives, Open Standards Principles, Methodologies, Philosophy, Software freedom, Open-Source Software Development, Licenses, Copyright vs. Copy left, Patents, Zero marginal cost, Income-generation Opportunities, Internationalization. Licensing: What Is A License, How to create your own Licenses, Important FOSS Licenses (Apache, BSD, PL, LGPL), copyrights and copy lefts, Patent.

**UNIT-III OPEN-SOURCE PROJECTS**

**(18 Hours)**

Starting and maintaining own Open-Source Project, Open-Source Hardware, Open-Source Design, Open-source Teaching, Opensource media. **Collaboration:** Community and Communication, Contributing to Open Source Projects Introduction to GitHub, interacting with the community on GitHub, Communication and etiquette, testing open-source code, reporting issues, contributing code. Introduction to Wikipedia, contributing to Wikipedia or contributing to any prominent open-source project of student's choice

**UNIT- IV OPEN-SOURCE ETHICS AND SOCIAL IMPACT**

**(18 Hours)**

Open source vs. closed source, Open-source Government, Ethics of Open-source, Social and Financial impacts of open-source technology, Shared software, Shared source, Open Source as a Business Strategy

**UNIT-V UNDERSTANDING OPEN-SOURCE ECOSYSTEM**

**(18 Hours)**

Open-Source Operating Systems: GNU/Linux, Android, Free BSD, Open Solaris. Open- Source Hardware, Virtualization Technologies, Containerization Technologies: Docker, Development tools, IDEs, Debuggers, Programming languages, LAMP, Open-Source Database technologies

**Total Lecturer Hours:90**



## COURSE OUTCOMES

The students will be able to,

1. Can identify the licensing of open-source systems and make decisions on their use, based on an understanding of the legal, economic and technical issues.
2. Can find open-source projects related to a given development problem
3. Differentiate between Open Source and Proprietary software and Licensing.
4. Recognize the applications, benefits and features of Open-Source Technologies
5. Gain knowledge to start, manage open-source projects

## TEXT BOOK(S)

1. “Open-Source Technology”, Kailash Vadera & Bhavyesh Gandhi, University Science Press, Laxmi Publications, 2009
2. “Open-Source Technology and Policy”, Fadi P. Deek and James A. M.Mc Hugh, Cambridge University Press, 2008.

## REFERENCE BOOK(S)

1. “Understanding Open Source and Free Software Licensing”, Andrew M. St.Laurent, O’Reilly Media.
2. “Perspectives on Free and Open-Source Software”, Clay Shirky and Michael Cusumano, MIT press.
3. “Open Source for the Enterprise”, Dan Woods, Gautam Guliani, O’Reilly Media

## E-RESOURCES

1. <http://kernel.org>
2. <https://opensource.org/>
3. <http://www.linuxfoundation.org/>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	2	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3
CO2	1	3	3	3	3	3	2	3	3	2	3	2	3	3	3	3	3
CO3	2	3	3	3	3	3	2	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	2	3	3	1	3	3	3	3	3	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 AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

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**Semester: I–CC-II: Python Programming**

**Ins. Hrs./Week:6**

**Course Credit:5**

**Course Code: P24IT102**

**UNIT I INTRODUCTION**

**(18 Hours)**

Fundamental ideas of Computer Science - Strings, Assignment, and Comments - Numeric Data types and Character sets – Expressions – Loops and Selection Statements: Definite iteration: the for Loop - selection: if and if-else statements - Conditional iteration: the while Loop.

**UNIT II STRINGS AND TEXT FILES**

**(19 Hours)**

Accessing Characters and substrings in strings - Data Encryption-Strings and Number systems- String methods – Text - Lists and Dictionaries: Lists – Dictionaries – Design with Functions: A Quick review- Problem Solving with top-Down Design - Design with recursive Functions - Managing a Program's namespace - Higher-Order Functions

**UNIT III DESIGN WITH CLASSES**

**(20 Hours)**

Getting inside Objects and Classes – Data-Modeling Examples – Building a New Data Structure – The Two – Dimensional Grid - Structuring Classes with Inheritance and Polymorphism - Graphical User Interfaces - The Behavior of terminal-Based programs and GUI-Based programs - Coding Simple GUI-Based programs - Windows and Window Components - Command Buttons and responding to events.

**UNIT IV WORKING WITH PYTHON PACKAGES**

**(17 Hours)**

NumPy Library-Nd array – Basic Operations – Indexing, Slicing and Iteration – Array manipulation Pandas –The Series – The Data Frame - The Index Objects – Data Visualization with Matplotlib – The Matplotlib Architecture – pyplot – The Plotting Window – Adding Elements to the Chart – Line Charts– Bar Charts – Pie charts

**UNIT V DJANGO**

**(16 Hours)**

Installing Django – Building an application – Project Creation – Designing the Data Schema - Creating an administration site for models - Working with Query Sets and Managers – Retrieving Objects – Building List and Detail Views.

**Total Lecture Hours- 90**

## COURSE OUTCOMES

The students will be able to,

1. Comprehend the programming skills in python and develop applications using conditional branches and loop
2. Create python applications with strings and functions
3. Understand and implement the Object-Oriented Programming paradigm with the concept of objects and classes, Inheritance and polymorphism
4. Evaluate the use of Python packages to perform numerical computations and data visualization
5. Design interactive web applications using Django

## TEXT BOOK(S)

1. K.A. Lambert, “Fundamentals of Python: first programs”, Second Edition, Cengage Learning, 2018.
2. Fabio Nelli, “Python Data Analytics: With Pandas, NumPy, and Matplotlib”, Second Edition, Kindle Edition, 2018.

## REFERENCE BOOK(S)

1. Antonio Mele, “Django 3 By Example”, Third Edition, 2020.
2. Jeff McNeil, “Python 2.6 Text Processing: Beginners Guide”, 2010, Packet Publications
3. Mark Pilgrim, “Dive into Python “, 2<sup>nd</sup> edition 2009, A press

## E\_RESOURCES

1. <https://www.computer-pdf.com/>
2. <https://rb.gy/mnhgz5>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3
	<b>S-Strong (3)</b>						<b>M-Medium (2)</b>				<b>L-Low (1)</b>						

# SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE



**(AUTONOMOUS)**

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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

## Semester: I–CP-I: Python Programming Lab

Ins. Hrs. /Week: 6

Course Credit:3

Course Code: P24IT103P

### EXERCISE

1. Program using elementary data items, lists, dictionaries and tuples
2. Program using conditional branches, loops
3. Program using functions
4. Program using classes and objects
5. Program using inheritance
6. Program using polymorphism
7. Program using Numpy
8. Program using Pandas
9. Program using Matplotlib
10. Program for creating dynamic and interactive web pages using forms

### COURSE OUTCOMES

The students will be able to,

1. Comprehend the programming skills in python and write scripts
2. Create python applications with elementary data items, lists, dictionaries and tuples
3. Implement the Object-Oriented Programming concepts such as objects and classes, Inheritance and polymorphism
4. Assess the use of Python packages to perform numerical computations and perform data visualization
5. Create interactive web applications using Django

### COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOM	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	2	3	3	2	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	2	3	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	2
CO5	3	3	2	3	3	3	3	3	1	3	3	3	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 AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

M.Sc., INFORMATION TECHNOLOGY

#### Semester: I–EC-I (A): Mobile Computing

Ins. Hrs. /Week:5

Course Credit:3

Course Code: P24ITE11A

#### UNIT I INTRODUCTION

(15 Hours)

Mobile Computing-Mobility of Bits and Bytes – Networks – Middleware and Gateways – Developing Mobile Computing Applications–**Mobile Computing Architecture:** Architecture for Mobile Computing–Three-Tier Architecture-Mobile Computing through Internet–**Emerging Technologies:** Bluetooth – Radio Frequency Identification (RFID) -Wireless Broadband (WIMAX)- Mobile IP – Internet Protocol Version6 (IPV6)- Java Card.

#### UNIT II GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM)

(15 Hours)

Global System for Mobile Communications - GSM Architecture–GSM Entities-Call Routing in GSM– GSM Addresses and Identifiers – Network Aspecting GSM –Mobility Management - GSM Frequency Allocation – Authentication and Security-**Short Message Service (SMS):** Mobile Computing Over SMS– Value Added Services through SMS- MMS.

#### UNIT III GENERAL PACKET RADIO SERVICE (GPRS)

(15 Hours)

Introduction - GPRS and Packet Data Network – GPRS Network Architecture – GPRS Network Operations – Data Services in GPRS - Applications for GPRS–Limitations of GPRS.– Wireless Data– Third Generation Networks – Applications on 3G.

#### UNIT IV GETTING STARTED WITH ANDROID

(15 Hours)

Android Definition-Android Versions-Features of Android-Architecture of Android – Activities, Fragments and Intents: Understanding Activities – Applying Styles and Themes to an Activity- Hiding the Activity Title- Displaying a Dialogue window-Intent-Fragments – Android User Interface: Understanding the Components of a screen- Adapting to Display Orientation– Designing User Interface with views – Displaying Pictures and Menus with Views – Data Persistence. Content Providers: Sharing Data in Android- Using a Content Provider- Predefined Query String Constants- Projections- Filtering- Sorting- Using the Content Provider.

#### UNIT V MESSAGING

(15 Hours)

SMS Messaging- Sending SMS Messages- Receiving SMS Messages – **Location Based Services:** Displaying Maps- Creating the Project- Changing Views- Navigation-Getting Location- Monitoring Location – **Networking:** Consuming Web Services using HTTP-Downloading Binary Data – Downloading Text Content - **Developing Android Services:** Creating Your Own Services-Performing Long-Running Tasks in a Service -Performing Repeated Tasks in a Service -Executing Asynchronous Tasks on Separate Threads Using Intent Service -Establishing Communication between a Service and an Activity - Binding Activities to Services -Understanding Threading.

**Total Lecture Hours-75**

## COURSE OUTCOMES

The students will be able to,

1. Apply the fundamental design paradigms and technologies to mobile computing applications.
2. Design effective mobile interfaces using human interaction principles.
3. Understand the role of mobile applications in software intensive systems.
4. Evaluate the usability of representative mobile devices such as smart phones and tablets.
5. Synthesize new knowledge in the area of mobile computing by using appropriate research methodologies and techniques.

## TEXT BOOK(S)

1. Ashok K Talukder, Hasan Ahmed, Roopa R Yavagal, 2010, “Mobile Computing”, 2nd Edition, TataMcGraw Hill Publishing Company Limited, India.
2. Wei Meng Lee, 2012, “Beginning Android 4 Application Development”, Wiley India Pvt. Ltd, New Delhi.

## REFERENCE BOOK(S)

1. Pradeep Kotari, 2014, “Android Application Development Black Book”, Dream tech Press.
2. Prasant Kumar Pattnaik, Rajib Mall, “Fundamentals of Mobile Computing”, PHILearning.
3. Jochen Schiller, 2008, “Mobile Communications”, Pearson Education, India.
4. RetoMeir, 2012, “Professional Android 4 Application Development”, Wiley India Pvt. Ltd., New Delhi.

## E-RESOURCES

1. [https://books.google.co.in/books/about/Mobile\\_Computing.html?id=psAgAQAAIAAJ](https://books.google.co.in/books/about/Mobile_Computing.html?id=psAgAQAAIAAJ)
2. <https://www.slideshare.net/mobile/ankurkumar983/mobile-computing-part1>
3. <https://www.google.com/amp/s/www.ncertbooks.guru/mobile-computing-pdf/amp/>
4. <https://www.javatpoint.com/mobile-computing>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	2	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3
CO2	3	2	2	3	3	3	2	3	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2	2	3
CO4	3	2	3	3	3	3	2	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	2	3	3	2	3	3	1	3	3	3	3	3	3	2

**S-Strong (3)**

**M-Medium (2)**

**L-Low (1)**



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
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( For the candidates admitted in the academic year 2024 – 2025)

**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

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**Semester: I–EC-I(B): Compiler Design**

**Ins. Hrs./Week: 5**

**Course Credit: 3**

**Course Code: P24ITE11B**

**UNIT- I INTRODUCTION TO COMPILERS (15 Hours)**

Compilers - Analysis - Synthesis model of compilation - Analysis of the source program  
- The phases of a compiler - Cousins of the compiler - Compiler construction tools - Error handling.

**UNIT- II LEXICAL ANALYZER (15 Hours)**

Lexical analysis - Role of lexical analyzer - Tokens, Patterns and lexemes - Input buffering  
- Specification of tokens - Regular expressions - Recognition of tokens - Transition diagrams -  
Implementing a transition diagram - Finite Automata -Regular expression to NFA - Conversion of  
NFA to DFA

**UNIT-III SYNTAX ANALYZER (15 Hours)**

Syntax analysis - Role of parser - Context-free grammars - Derivations - Writing a grammar - Top-  
Down parsing - Recursive descent parsing - Predictive parsers - Non- recursive predictive parsers -  
Construction of predictive parsing tables -Bottom up parsing  
- Handles - Shift reduce parser - Operator precedence parsing- LR parsers - Canonical collection of  
LR (0) items -Constructing SLR parsing tables.

**UNIT-IV INTERMEDIATE CODE GENERATION (15 Hours)**

Intermediate code generation - Intermediate languages - Graphical Representation - Three Address  
Code - Assignment statements – Boolean expressions - Flow of Control Statements - Case Statements  
-. Syntax directed translation of case statements

**UNIT-V CODE OPTIMIZATION AND CODE GENERATION (15 Hours)**

An Organization for an Optimizing Compiler - the Principle sources of optimization - Function  
Preserving Transformations - Common Subexpression - Copy propagation - Optimization of basic  
blocks - The use of Algebraic identities-Loops in flow graphs - Code generation - issues in the design  
of a code generator-The target machine.

**Total Lecture Hours-75**

## COURSE OUTCOMES

The students will be able to,

1. Understand the fundamentals of a compiler.
2. Get knowledge about the context-free grammars and various parsing techniques.
3. Understand the lexical analyzer and syntax analyzer of Compiler types and sources of errors, from the compiler's perspective.

## TEXT BOOK(S)

1. "Compilers: Principles, Techniques, and Tools", Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Second Edition, Pearson Addison Wesley, 2007.
2. Compiler Construction Principles and Practice – D.M.Dhamadhere, McMillan India Ltd., Madras, 1983.

## REFERENCE BOOK(S)

1. Alfred V. Aho, Ravi Sethi and Jeffrey D Ullman, "Compilers, Principles, Techniques and Tools", Addison Wesley Longman (Singapore Pvt. Ltd.), 2011.
2. Alfred V. Aho, Jeffrey D Ullman, "Principles of Compiler Design", Addison Wesley, 1988.
3. David Galles, "Modern Compiler Design", Pearson Education, 2008

## E-RESOURCES

1. [https://www.vssut.ac.in/lecture\\_notes/lecture1422914957.pdf](https://www.vssut.ac.in/lecture_notes/lecture1422914957.pdf)
2. [https://mrctet.com/downloads/digital\\_notes/CSE/III%20Year/COMPILER%20DESIGN%20NOTES.pdf](https://mrctet.com/downloads/digital_notes/CSE/III%20Year/COMPILER%20DESIGN%20NOTES.pdf)
3. <https://www.vsm.edu.in/R-16-CSE-III-I/CD.pdf>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	2	3	3	2	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	2	3	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	1	3	3	3	3	3	2	3
CO4	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	2	3	3	3	3	3	2	3	3	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)





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

**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

**Semester: I–EC-I(C): Social Networking**

**Ins. Hrs./Week: 5**

**Course Credit: 3**

**Course Code: P24ITE11C**

**UNIT I: INTRODUCTION**

**(15 Hours)**

Social Media Strategy-Important First Decisions -Websites, Blogs - RSS Feeds Mapping -Preparation - Multimedia Items Gathering Content for Blog Posts RSS Feeds & Blogs-RSS Feeds-The Feed Reader-The Feed-Options for Creating an RSS Feed-Planning Feed-Blogs-Options for Starting. Blog and RSS Feed-Feed or Blog Content-Search Engine Optimization (SEO)-Feed Burner-RSS Feed and Blog Directories-An Optimization Plan for Blog or RSS Feed

**UNIT II: BUILDING A WORD PRESS POWERED WEBSITE**

**(15 Hours)**

Word Press as A CMS - Diversity of Word Press Sites-The Anatomy of a Word Press Site -a Brief Look at the Word Press Dashboard Planning - Site Themes Plug-ins setting up Sidebars Building Pages- Posting Blog Entries. Podcasting, Vidcasting, & Webcasting- Publishing Options for Podcast-Creating and Uploading Podcast Episodes-Publishing Podcast Optimizing Podcast- Webcasting

**UNIT III: SOCIAL NETWORKING & MICRO-BLOGGING**

**(15 Hours)**

Facebook-The Facebook Profile -Myspace LinkedIn-Twitter-Niche Social Networking Sites-Creating Own Social Network-Promoting Social Networking Presence- Social Bookmarking & Crowd-Sourcing - Social Bookmarking-A Social Bookmarking Strategy- Crowd-Sourced News Sites-Preparation And Tracking Progress Media Communities-Image Sharing Sites-Image Sharing Strategy-Video Sharing Sites-Video Sharing Strategy-Searching And Search Engine Placement-Connecting With Others.

**UNIT IV: WIDGETS & BADGES:**

**(15 Hours)**

Highlighting Social Web Presence-Sharing And Syndicating Content Making Site More Interactive-Promoting Products And Making Money-Using Widgets In Word Press-Widget Communities And Directories- Working Widgets Into Strategy Social Media Newsrooms-Building Social MediaNewsroom - Populating The Newsroom-Social Media News Releases-Social Media Newsroom Examples. More Social Tools-Social Calendars-Social Pages Wikis-Social Search Portals-Virtual Worlds.

**UNIT V: WEBSITE OPTIMIZATION:**

**(15 Hours)**

A Website Optimization Plan-Streamlining Web Presence-An Integration Plan- Looking to the Future-Life streaming: The Future of Blogging-Distributed Social Networking-Social Ranking, Relevancy, and —Defriending-Web 3.0 or The Semantic Web-Mobile Technology- Measuring Your Success-A Qualitative Framework-A Quantitative Framework-Tools to Help You Measure-Come to Your Own Conclusions

**Total Lecture Hours:75**

## COURSE OUTCOMES

The students will be able to,

1. To understand, impart and summarize the concepts of Social media, Social networking and Webcasts
2. To comprehend, design and develop a Word Press Powered Website
3. To understand, implement and perform evaluation of Social Networking and Micro-Blogging
4. To collaborate, implement and analyze the Widgets and Badges in social networking environment
5. To understand, illustrate and perform evaluation of web optimization for social networks

## TEXT BOOK(S)

1. Deltina hay —A Survival Guide To social media and Web 2.0 Optimization, Dalton Publishing, 2009

## REFERENCE BOOK(S)

1. Miriam Salpeter —Social networking for Career Success, Learning Express, 2011.
2. Miles, Peggy, —Internet world guide to webcasting, Wiley, 2008 Professionals”, Wiley Publication, 2015.

## E-RESOURCES

1. <https://ils.unc.edu/cws/Handouts/Social%20Networking/Social-Networking.pdf>
2. <https://www.techopedia.com/definition/4956/social-networking-site-sns>
3. [https://www.tutorialspoint.com/internet\\_technologies/social\\_networking.htm](https://www.tutorialspoint.com/internet_technologies/social_networking.htm)

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
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CO2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3
	<b>S-Strong (3)</b>				<b>M-Medium (2)</b>				<b>L-Low (1)</b>								

# SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE



**(AUTONOMOUS)**

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

**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

**Semester: I–EC-II(A): Internet of Things**

**Ins. Hrs. /Week: 5**

**Course Credit:3**

**Course Code: P24ITE12A**

## **UNIT I INTRODUCTION TO IOT**

**(15 Hours)**

Introduction to IOT - Definition and Characteristics, Physical Design Things- Protocols, Logical Design- Functional Blocks, Communication Models- Communication APIs-Introduction to measure the physical quantities, IOT Enabling Technologies - Wireless Sensor Networks, Cloud Computing Big Data Analytics, Communication Protocols- Embedded System- IOT Levels and Deployment Templates.

## **UNIT II IOT APPLICATIONS**

**(15 Hours)**

Home Automation- Smart Lighting- Smart Appliances- Intrusion Detection- Smoke/Gas Detectors – **Smart Cities:** Smart Parking-Smart Lighting-Smart Roads- Structural Health Monitoring- Surveillance- **Environment:** Weather Monitoring- Air Pollution Monitoring- Noise Pollution Monitoring- ForestFireDetection-**RiverFloodsDetection,Energy:** SmartGrids-RenewableEnergy Systems- Retail:InventoryManagement,SmartPayments-SmartVendingMachines-**Logistics:**Route Generation-Fleet Tracking- Shipment Monitoring- **Agriculture:** Smart Irrigation- Green House Control, **Industry:** Machine Diagnosis-Indoor Air Quality Monitoring- **Health and Lifestyle:** Health and Fitness Monitoring.

## **UNIT III NETWORK OF WIRELESS SENSOR NODES**

**(15Hours)**

Introduction- Background of Sensor Network Technology- Applications of Sensor Networks- **Basic Overview of the Technology:** Basic Sensor Network Architectural Elements- **Applications of Wireless Sensor Networks:** Examples of Category 2 WSN Applications- Home Control- Building Automation - Industrial Automation - Medical Applications- Examples of Category 1 WSN Applications: Sensor and Robots - Reconfigurable Sensor Networks-Highway Monitoring Military Applications-Civil and Environmental Engineering Applications-Wildfire Instrumentation- Habitat Monitoring – Nanoscopic Sensor Applications- **Basic Wireless Sensor Technology:** Sensor Node Technology- WN Operating Environment.

## **UNIT IV MAC, Routing Protocols for WSN**

**(15Hours)**

Introduction–**Fundamentals of MAC Protocols:** Performance Requirements-Common Protocols– MAC protocols for WSN: Schedule-Based Protocols- Random Access-Based Protocols – **Sensor- MAC Case Study:** Protocol Overview- Periodic Listen and Sleep Operations- Schedule Selection and Coordination-Schedule Synchronization- Adaptive Listening- Access Control and Data Exchange- Message Passing.

## **UNIT V Transport Controlling WSN**

**(15 Hours)**

Traditional Transport Control Protocols -TCP(RFC793)-UDP(RFC768) -Mobile IP-Feasibility of Using TCP or UDP for WSNs - **Transport Protocol Design Issues:** Examples of Existing Transport Control Protocols-CODA (Congestion Detection and Avoidance)-ESRT (Event-to-Sink Reliable Transport)- RMST (Reliable Multi segment Transport)- PSFQ (Pump Slowly, Fetch Quickly)- GARUDA- ATP (Ad Hoc Transport Protocol).

**Total Lecturer Hours-75**

## COURSE OUTCOMES

The students will be able to,

1. Understand the fundamentals of IOT
2. Analyze the Design of IOT systems
3. Develop programs for IOT systems
4. Identify wireless sensor networks
5. Understand protocols and routing methods for wireless sensor networks

### TEXT BOOK(S)

1. Arshdeep Bahga and Vijay Madisetti, 2015, "Internet of Things: Hands-on Approach", University Press, Hyderabad.
2. Kazem Sohraby, Daniel Minoli and Taieb Znati, 2010, "Wireless Sensor Networks: Technology, Protocols and Application", Wiley Publications, New Delhi.

### REFERENCE BOOK(S)

1. Michael Miller, 2015, "The Internet of Things", Pearson Education, India.
2. Walteneus Dargie and Christian Poellabauer, 2010, "Fundamentals of Wireless Sensor Networks: Theory and Practice", John Wiley and Sons Ltd.
3. Carlos De Morais Cordeiro and Dharma Prakash Agrawal, 2011, "AdHoc and Sensor Networks: Theory and Applications", World Scientific Publishing.
4. Edgar Callaway, 2003, "Wireless Sensor Networks: Architecture and Protocols", Auerbach Publications.
5. Erdalcayirci and Chunming Rong, 2009, "Security in Wireless AdHoc and Sensor Networks", John Wiley and Sons.
6. Holger Karl and Andreas Willig, 2005, "Protocols and Architectures for Wireless Sensor Networks", John Wiley & Sons Inc.,
7. Walteneus Dargie and Christian Poellabauer, 2010, "Fundamentals of Wireless Sensor Networks: Theory and Practice", John Wiley and Sons.

### E-RESOURCES

1. <https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/>
2. <https://data-flair.training/blogs/iot-applications/>
3. <https://www.sciencedirect.com/topics/computer-science/wireless-sensor-networks>

### COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	2	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3
CO2	1	3	3	3	3	3	2	3	3	2	3	2	3	3	3	3	3
CO3	2	3	3	3	3	3	2	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	2	3	3	1	3	3	3	3	3	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 AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

**Semester: I–EC-II (B): Advanced Data Structures**

**Ins. Hrs. /Week: 5**

**Course Credit: 3**

**Course Code: P24ITE12B**

**UNIT I INTRODUCTION**

**(15 Hours)**

Arrays – Singly Linked List – Circularly Linked List – Stack – Queues – List Abstract Data Type (ADT) – Iterators – Graphs and Sorting 1- Graphs: Graph ADT– Data Structures for Graphs – Graph Traversals – Directed Acyclic Graphs – Shortest Paths – Minimum Spanning Tree - Sorting: Merge Sort – Quick Sort – Selection Sort.

**UNIT II HASHING**

**(15 Hours)**

General Idea, Hash Function, Separate Chaining, Hash Tables without linked lists: Linear Probing, Quadratic Probing, Double Hashing, Rehashing, Hash Tables in the Standard Library, Universal Hashing, Extendible Hashing.

**UNIT III PRIORITY QUEUES (HEAPS)**

**(15 Hours)**

Model, Simple implementations, Binary Heap: Structure Property, Heap Order Property, Basic Heap Operations: insert, delete, Percolate down, Other Heap Operations.

**UNIT IV TREES**

**(15 Hours)**

AVL: Single Rotation, Double Rotation, B-Trees. **Multi-way Search Trees**– Trees: Searching for an Element in a Tree, Inserting a New Element in a Tree, Deleting an Element from a Tree. **Red-Black Trees** – Properties of red-black trees, Rotations, Insertion, Deletion.

**UNIT V GRAPHS ALGORITHMS**

**(15 Hours)**

Elementary Graph Algorithms: Topological sort, Single Source Shortest Path Algorithms: Dijkstra's, Bellman-Ford, All-Pairs Shortest Paths: Floyd-Warshall's Algorithm.

**Total Lecture Hours- 75**

## COURSE OUTCOMES

The students will be able to

1. Understand the fundamentals of a Data Structures.
2. Get knowledge about the concepts of Hashing.
3. Understand the concepts of priority queues.
4. Understand the concepts of AVL and Trees.
5. Know the concepts of Graph algorithms.

## TEXT BOOK(S)

1. Mark Allen Weis, Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, 4th Edition, 2014, Pearson.
2. Thomas H Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, 3rd Edition, 2009, The MIT Press.

## REFERENCE BOOK(S)

1. Ellis Horowitz, Satraj Sahani and Rajasekharam, Fundamentals of Computer Algorithms, 2nd Edition, 2009, University Press Pvt. Ltd.
2. Reema Thareja, S. Rama Sree, Advanced Data Structures, Oxford University Press, 2018.

## E-RESOURCES

1. <https://www.csc.lsu.edu/~kundu/dstr/1-intr.pdf>
2. <https://www.javatpoint.com/advance-data-structures>
3. <https://bphanikrishna.wordpress.com/advanced-data-structures/>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3
CO2	3	3	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	2	3	3
CO4	2	3	2	3	3	3	2	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	2	3	3	3	2	3	3	3

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



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

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**Semester: I–EC-II(C): Object Oriented Systems Development**

**Ins. Hrs./Week: 5**

**Course Credit:3**

**Course Code: P24ITE12C**

**UNIT I FUNDAMENTALS OF OOSD**

**(15 Hours)**

Overview of Object-Oriented Systems Development: Two orthogonal view of the software - OOSD methodology - Object basics: Object Oriented Philosophy- Objects – Attributes – Object respond to messages – Encapsulation and information hiding – class hierarchy – Polymorphism – Object relationship and associations. OOSD life cycle: Software development process – OOSD Use case Driven Approach – Reusability.

**UNIT II METHODOLOGY, MODELLING AND UML**

**(15 Hours)**

Object Oriented Methodologies: Rumbaugh et al.'s object modelling technique-The Booch methodology – The Jacobson et al. methodology – Patterns – Frameworks - The Unified approach. Unified Modelling Language: Static and dynamic models – UML diagrams – UML class diagram – Use case diagram-UML dynamic modelling – packages and model organization.

**UNIT III OBJECT ORIENTED ANALYSIS**

**(15 Hours)**

Object Oriented Analysis process: Business Object Analysis - Use case driven-object oriented analysis – Business process modelling – Use-Case model – Developing effective documentation. Classification: Classifications theory-Approaches for identifying classes – Noun phrase approach – Common classpatterns approach – Use- Case Driven approach – Classes, Responsibilities, and Collaborators - Naming classes. Identifying object relationships, attributes, and methods: Association – Super-Sub class relationship – Aggregation – Class responsibility – Object responsibility.

**UNIT IV OBJECT ORIENTED DESIGN**

**(15 Hours)**

Object Oriented Design Process and Design Axioms - OOD process- OOD axioms Corollaries – Design patterns. Designing classes: Designing classes – Class Visibility-Refining attributes – Designing methods and protocols – Packages and managing classes. Access layer: Object Store and persistence – DBMS-Logical and physical Database Organization and access control – Distributed Databases and Client Server Computing — Multi database Systems – Designing Access layer classes. View Layer: Designing view layer classes-Macro level process – Microlevel process – The purpose of view layer interface – Prototyping the user interface.

**UNIT V SOFTWARE QUALITY**

**(15 Hours)**

Software Quality Assurance: Quality assurance tests – Testing strategies – Impact of Object Orientation on Testing - Test Cases- Test Plan – Continuous testing. System Usability and Measuring User satisfaction: Usability Testing – User satisfaction test – A tool for analyzing user satisfaction. System Usability and Measuring User satisfaction: Introduction – Usability Testing.

**Total Lecture Hours- 75**

## COURSE OUTCOMES

The students will be able to:

1. Show how the object-oriented approach differs from the traditional approach to systems analysis and design.
2. Analyze, design, document the requirements through use case driven approach
3. Explain the importance of modelling and how the Unified Modelling Language (UML) represents an object-oriented system using a number of modelling views.
4. Recognize the difference between various object relationships: inheritance, association and aggregation.
5. Show the role and function of test cases, testing strategies and test plans in developing object-oriented software

## TEXT BOOK(S)

1. Ali Bahrami, "Object Oriented Systems Development using UML", McGraw-Hill, 2008
2. Booch Grady, Rumbaugh James, Jacobson Ivar, "The Unified modeling Language – User Guide, Pearson Education, 2006

## REFERENCE BOOK(S)

1. Brahma Dathan, Sarnath Ramnath, "Object Oriented Analysis, Design and Implementation", Universities Press, 2010.
2. Mahesh P.Matha, "Object-Oriented Analysis and Design Using UML", PHI Learning Private Limited, 2012.
3. Rachita Misra, Chhabi Rani Panigrahi, Bijayalaxmi Panda, "Principles of Software Engineering and System Design", Yesdee Publishing 2019.

## E-RESOURCES

1. [https://www.tutorialspoint.com/object\\_oriented\\_analysis\\_design/ood\\_object\\_oriented\\_system.htm](https://www.tutorialspoint.com/object_oriented_analysis_design/ood_object_oriented_system.htm)
2. <https://www.w3computing.com/systemsanalysis/object-oriented-systems-nalysisdesign/>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	S-Strong (3)			M-Medium (2)				L-Low (1)									



# **SEMESTER II**



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE  
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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II–CC-III: Advanced Database Systems**

**Ins. Hrs. /Week:6**

**Course Credit:5**

**Course Code: P24IT204**

**UNIT I RELATIONAL AND PARALLEL DATABASE DESIGN (18 Hours)**

Basics, Entity Types, Relationship Types, ER Model, ER-to-Relational Mapping algorithm. Normalization: Functional Dependency, 1NF, 2NF, 3NF, BCNF, 4NF and 5NF. Architecture, I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism.

**UNIT II DISTRIBUTED AND OBJECT BASED DATABASES (18 Hours)**

Architecture, Distributed data storage, Distributed transactions, Commit protocols, Concurrency control, Query Processing. Complex Data Types, Structured Types and Inheritance, Table Inheritance, array and Multiset, Object Identity and Reference Types, Object Oriented versus Object Relational.

**UNIT III SPATIAL DATABASE (18 Hours)**

Spatial Database Characteristics, Spatial Data Model, Spatial Database Queries, Techniques of Spatial Database Query, Logic based Databases: Introduction, Overview, Propositional Calculus, Predicate Calculus, Deductive Database Systems, Recursive Query Processing

**UNIT IV XML DATABASES (18 Hours)**

XML Hierarchical data model, XML Documents, DTD, XML Schema, XML Querying, XHTML, Illustrative Experiments

**UNIT V TEMPORAL DATABASES (18 Hours)**

Introduction, Intervals, Packing and Unpacking Relations, Generalizing the relational Operators, Database Design, Integrity Constraints, Multimedia Databases: Multimedia Sources, Multimedia Database Queries, Multimedia Database Applications.

**Total Lecturer Hours:90**

## COURSE OUTCOMES

At the end of the course, the students will be able to:

1. Acquired knowledge for developing holistic solutions based on database systems/database techniques.
2. Normalize relational database design of an application
3. Critically assess new developments in database technology
4. Know about the Various Data models and Works on Database Architecture
5. Interpret and explain the impact of emerging database standards

## TEXT BOOK(S)

1. Abraham Silberschatz, Henry F Korth, S Sudarshan, "Database System Concepts", 6th edition, McGraw-Hill International Edition, 2011
2. C.J.Date, A.Kannan,S.Swamynathan,"An Introduction to DatabaseSystems",8th Edition, Pearson Education Reprint 2016.

## REFERENCE BOOK(S)

1. Ramez Elmasri, Shamkant B Navathe, "Fundamental of Database Systems", Pearson, 7th edition 2016.
2. Thomas Connolly, Carolyn Begg., "Database Systems a practical approach to Design, Implementation and Management ", Pearson Education, 2014.

## E-RESOURCES

- 1.<https://www.simplilearn.com/tutorials/sql-tutorial/what-is-normalization- in-sql>
- 2.<https://www.tutorialspoint.com/Spatial-Databases>
- 3.<https://www.oracle.com/database/spatial/>
- 4.<https://nptel.ac.in/courses/106/106/106106093/>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	2	3	3	3	3	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	2	3	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3
CO5	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	S-Strong (3)			M-Medium (2)				L-Low (1)									



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II–CC-IV: CRYPTOGRAPHY AND NETWORK SECURITY**

**Ins. Hrs. /Week:6**

**Course Credit:5**

**Course Code: P24IT205**

**UNIT I COMPUTER AND NETWORK SECURITY CONCEPTS (18 Hours)**

Introduction: The OSI Security Architecture-Security attacks-Security Services- Security mechanisms - A model for network Security - Classical Encryption Techniques: Symmetric Cipher model: Cryptography – Cryptanalysis and Brute-Force Attack. Substitution Techniques: Caesar Cipher – Monoalphabetic Ciphers – Play fair Cipher – Hill Cipher – Polyalphabetic Ciphers – One Time Pad. Transposition Techniques–Rotor Machines–Steganography.

**UNIT II BLOCK CIPHERS AND THE DATA ENCRYPTION STANDARDS (18 Hours)**

Traditional Block Cipher Structure-Stream Ciphers and block Ciphers – Motivation for the Feistel Cipher Structure – The Feistel Cipher- **the Data Encryption Standard:** DES Encryption – DES Decryption. **The Strength of DES:** The use of 56-Bit Keys – The Nature of the DES Algorithm Timing Attacks. **Block Cipher Design Principles:** Number of Rounds – Design of function F Key Schedule Algorithm. **Public-Key Cryptography and RSA:** Public Key Cryptosystems- Applications for Public-Key Cryptosystems– Requirements for public-Key Cryptography–Public Key Cryptanalysis-The RSA Algorithm. **Cryptographic Hash Functions:** Applications of Cryptographic Hash Functions –SHA-3.

**UNIT III TRANSPORT LEVEL SECURITY (18 Hours)**

Web Security Considerations- Web Security Threats- Web Traffic Security Approaches. **Secure Socket Layer :** SSL Architecture – SSL Record Protocol – Change Cipher Spec Protocol – Alert Protocol – Handshake Protocol- Cryptographic Computations. **Transport Layer Security:** Version Number-Message Authentication Code – Pseudorandom Function –Alert Codes – CipherSuites – Client Certificate types – Certificate-Verify and Finished Messages – Cryptographic Computations- Padding. HTTPS – Secure Shell(SSH) - secure electronic transaction (SET)

**UNIT IV WIRELESS NETWORK SECURITY AND IP SECURITY (18 Hours)**

Wireless Security - Wireless Network Threats – Wireless Security Measures. **Mobile Device Security:** Security Threats – **Mobile Device Security Strategy. IEEE 802.11.Wireless LAN Overview:** The Wi-Fi Alliance – IEEE 802 Protocol Architecture – IEEE 802.11 Network Components and Architectural Model – IEEE 802.11 Services. **IEEE 802.11i Wireless LAN Security:** IEEE 802.11i Services – IEEE 802.11i Phases of Operations – Discovery Phase – Authentication Phase – Key Management Phase – Protected data Transfer Phase – The IEEE Pseudo random Function. **IP Security:** Overview-IP Security policy – Encapsulating Security Payload – Combining Security Associations – Internet Key Exchange.

## UNIT V SYSTEM SECURITY

(18 Hours)

**System Security:** Intruders-Intrusion Detection-Password Management- Malicious Software: Types of Malicious Software(Malware)-Advanced Persistent Threat-Viruses- Worms-Spam E-mail, Trojans-SystemCorruption-Zombie, Bots - Information Theft - Keyloggers, Phishing, Spyware-Countermeasures-Distributed Denial of Service attacks- Firewalls: The Need for Firewalls-Firewall characteristics and AccessPolicy- Types of Firewalls-Firewall basing-Firewall Location and Configurations

**Total Lecture Hours-90**

### COURSE OUTCOMES

The Students will be able to,

1. Understand the concepts, methods of Network Security using cryptography basics.
2. Analyze and design classical encryption techniques and block ciphers.
3. Acquire knowledge about Public Key cryptography.
4. Evaluate Hash Functions in network security.
5. Analyze about IP security, Wireless Network security.

### TEXT BOOK(S)

1. William Stallings,2017, “Cryptography and Network Security”-Principles and Practices,Prentice-Hall, Seventh edition, ISBN:10:1-292-15858-1, India.
2. Behrouz A. Ferouzan, 2015, “Cryptography & Network Security”, Tata Mc Graw Hill, India.

### REFERENCE BOOK(S)

1. Neal Krawetz, 2007, “Introduction to Network Security”, Charles River media Publications.
2. Johannes A. Buchaman, 2004, “Introduction to cryptography” (2<sup>nd</sup> edition), 2004. ISBN 0387207562, Springer Publications, United States.
3. Robert Collins,2017, “Network Security Monitoring: Basics for Beginners”.
4. William Stalings, 2016, “Network Security Essentials-Applications and Standards”,Sixth Edition,Pearson Publications, India.

### E\_RESOURCES

1. [https://www.vssut.ac.in/lecture\\_notes/lecture1428550736.pdf](https://www.vssut.ac.in/lecture_notes/lecture1428550736.pdf)
2. <https://annauniversityedu.blogspot.com/2020/08/cryptography-and-network-security-notes-AU.html>
3. <http://surya.ac.in/wp-content/uploads/2020/09/Unit-1-5-CS8792-CNS-Notes.pdf>

### COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3

**S-Strong (3)**

**M-Medium (2)**

**L-Low (1)**



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

**Semester: II–CP-II: RDBMS Lab**

**Ins. Hrs./Week:6**

**Course Credit:3**

**Course Code: P24IT206P**

**EXERCISE**

1. DDL Commands
2. DML Commands
3. DCL Commands
4. Usage of Sub Queries in DML and Create-SQL
5. Solving queries using built-in functions
6. Simple programs in PL/SQL block
7. Exception Handling in PL/SQL
8. Programs using Implicit Cursors
9. Programs using Explicit Cursors
10. Procedures & User-defined functions
11. Creation of Triggers

**COURSE OUTCOMES**

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

1. Choose appropriate SQL queries and PL/SQL blocks for the database.
2. Implement SQL and PL/SQL blocks for the given problem effectively.
3. Analyze the problem and Exceptions using queries and PL/SQL blocks.
4. Validate the database for normalization using SQL and PL/SQL blocks.
5. Design Database tables, create Procedures, user-defined functions and Triggers

**COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)**

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
CO2	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3
CO3	3	3	3	2	3	3	3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	3	3

**S-Strong (3)**

**M-Medium (2)**

**L-Low (1)**



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

**Semester: II–EC-III (A): Biometrics Techniques**

**Ins. Hrs. /Week:5**

**Course Credit:3**

**Course Code: P24ITE23A**

**UNIT I INTRODUCTION**

**(15 Hours)**

Person Recognition – Biometric systems –Biometric functionalities: verification, identification – Biometric systems errors - The design cycle of biometric systems – Applications of Biometric systems – Security and privacy issues.

**UNIT II FINGER PRINT AND FACIAL RECOGNITION**

**(15 Hours)**

FINGERPRINT: Introduction – Friction ridge pattern- finger print acquisition: sensing techniques, image quality –Feature Extraction –matching –indexing. FACE RECOGNITION: Introduction –Image acquisition: 2D sensors ,3D sensors- Face detection- Feature extraction -matching.

**UNIT III IRIS AND OTHER TRAITS**

**(15 Hours)**

Design of an IRIS recognition system-IRIS segmentation- normalization – encoding and matching IRIS quality –performance evaluation –other traits- ear detection –ear recognition –gait feature extraction and matching –challenges- hand geometry –soft biometrics.

**UNIT IV BEHAVIORAL BIOMETRICS**

**(15 Hours)**

Introduction –Features- classification of behavioral biometrics –properties of behavioral biometrics – signature –keystroke dynamics –voice- merits –demerits –applications- error sources-types –open issues –future trends.

**UNIT V APPLICATIONS AND TRENDS**

**(15 Hours)**

Application areas: surveillance applications- personal applications –design and deployment -user system interaction-operational processes – architecture –application development –design validation disaster recovery plan-maintenance-privacy concerns.

**Total Lecturer Hours :75**

**COURSE OUTCOMES**

At the end of the course, the student should be able to

1. Identify the various Biometric technologies
2. Design of biometric recognition for the organization
3. Develop simple applications for privacy
4. Understand the need of biometric in the society technologies.

### TEXT BOOK(S)

1. James wayman, Anil k. Jain, Arun A. Ross, Karthik Nandakumar, —Introduction to Biometrics, Springer, 2011
2. John Vacca "Biometrics Technologies and Verification Systems" Elsevier 2007

### REFERENCE BOOK(S)

1. Khalid saeed with Marcin Adamski, Tapalina Bhattasali, Mohammed K. Nammous, Piotr panasiuk, mariusz Rybnik and soharab H. Sgaikh, —New Directions in Behavioral Biometrics, CRC Press 2017
2. James Wayman, Anil Jain, David M. Altoni, Dasio Maio (Eds) "Biometrics Systems Technology", Design and Performance Evaluation. Springer 2005
3. Paul Reid "Biometrics For Network Security" Person Education 2004
4. Shimon K. Modi, —Biometrics in Identity Management : concepts to applications, Artech House 2011

### E-RESOURCES

1. [https://www.tutorialspoint.com/biometrics/biometrics\\_quick\\_guide.htm](https://www.tutorialspoint.com/biometrics/biometrics_quick_guide.htm)
2. [https://www.pvpsiddhartha.ac.in/dep\\_it/lecture%20notes/Biometrics/BiometricUnit-1.pdf](https://www.pvpsiddhartha.ac.in/dep_it/lecture%20notes/Biometrics/BiometricUnit-1.pdf)
3. [https://www.pvpsiddhartha.ac.in/dep\\_it/lecture%20notes/Biometrics/BiometricUnit-1.pdf](https://www.pvpsiddhartha.ac.in/dep_it/lecture%20notes/Biometrics/BiometricUnit-1.pdf)

### COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
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CO2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3	3	3	2	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	3	3	3	2	3	2	3	3
CO5	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	2

S-Strong (3)

M-Medium (2)

L-Low (1)





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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II–EC-III(B): Digital Watermarking and Steganography**

**Ins. Hrs. /Week: 5**

**Course Credit:3**

**Course Code: P24ITE23B**

**UNIT I INTRODUCTION (15 Hours)**

Information Hiding, Steganography, and Watermarking. History of Watermarking. History of Steganography, Importance of Digital Watermarking. Importance of Steganography

**UNIT II STEGANOGRAPHY (15 Hours)**

Steganographic Communication, The Channel, The Building Blocks, Notation and Terminology, Information - Theoretic Foundations of Steganography, Cachin's Definition of Steganographic Security, Practical Steganographic Methods, Statistics Preserving Steganography, Model-Based Steganography, Steganalysis Scenarios, Detection, Forensic Steganalysis, The Influence of the Cover Work on Steganalysis, Some Significant Steganalysis Algorithms, LSB Embedding and the Histogram Attack.

**UNIT III WATERMARKING (15 Hours)**

Properties – Evaluating watermarking systems. Notation – Communications – Communication based models – Geometric models – Mapping messages into message vectors – Error correction coding – Detecting multi-symbol watermarks – Attacks

**UNIT IV MODELS OF WATERMARKING (15 Hours)**

Notation, Communications, Components of Communications Systems, Classes of Transmission Channels, Secure Transmission, Communication-Based Models of Watermarking, Basic Model, Watermarking as Communications with Side Information at the Transmitter, Watermarking as Multiplexed Communications, Geometric Models of Watermarking, Distributions and Regions in MediaSpace, Marking Spaces, Modeling Watermark Detection by Correlation, Linear Correlation, Normalized Correlation, Correlation Coefficient.

**UNIT V APPLICATIONS (15 Hours)**

Applications of Watermarking, Broadcast Monitoring, Copyrights, Proof of Ownership, Transaction Tracking, Content Authentication, Copy Control, Device Control, Legacy Enhancement. Applications of Steganography, Steganography for Dissidents, Steganography for Criminals

**Total Lecturer Hours:75**

## COURSE OUTCOMES

The students will be able to

- Discuss the need for watermarking and steganography
- Distinguish between watermarking and steganography
- Elaborate on the various models of watermarking and steganography.
- Point out various steganalysis algorithms.
- Show how watermarking and steganography can be applied to various applications and

## TEXT BOOK(S)

1. Ingemar J. Cox, Mathew L. Miler, Jeffrey A. Blom, Jesica Fridrich, Ton Kalker, —Digital Watermarking and Steganography, Morgan Kaufmann Publishers, New York, 2008.
2. Ingemar Cox, Mathew Miler, Jeffrey Blom, Jesica Fridrich and Ton Kalker, —Digital Watermarking and Steganography, Morgan Kaufmann Publishers, Nov 2007.

## REFERENCE BOOK(S)

1. Ingemar J. Cox, Mathew L. Miler, Jeffrey A. Blom, —Digital Watermarking, Morgan Kaufmann Publishers, New York, 2003
2. Juergen Seits, —Digital Watermarking for Digital Medial, IDEA Group Publisher, New York, 2005.
3. Jesica Fridrich, —Steganography in Digital Media: Principles, Algorithms, and Applications, Cambridge University press, 2010.
4. Michael Arnold, Martin Schmucker, Stephen D. Wolthusen, —Techniques and Applications of Digital Watermarking and Contest Protection, Artech House, London, 2003.

## E-RESOURCES

1. <https://www.albany.edu/~goel/classes/spring2007/itm604/notes/steganography.pdf>
2. [http://wiki.cas.mcmaster.ca/index.php/Steganography\\_and\\_Digital\\_Watermarking](http://wiki.cas.mcmaster.ca/index.php/Steganography_and_Digital_Watermarking)
3. [https://www.fi.muni.cz/usr/gruska/crypto13/crypto\\_11.pdf](https://www.fi.muni.cz/usr/gruska/crypto13/crypto_11.pdf)

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	2	3	3	3	3	1	3	3	3	2	3	3	3	3
CO4	1	3	3	3	3	3	2	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	1

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 AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II–EC-III (C): Digital Image Processing**

Ins hrs / Week:5

Course Credit:3

Course Code: P24ITE23C

**UNIT I CONTINUOUS AND DISCRETE IMAGES AND SYSTEMS (15 Hours)**

Introduction - Digital Image Processing System-Problems and Applications-Image Representation and Modeling – **Two-Dimensional Systems and Mathematical Preliminaries:** Linear Systems and Shift Invariance-Fourier Transform- Z Transform-Matrix Theory Results-Block Matrices and Kronecker Products - **Image Perception:** Light-Luminance- Brightness and Contrast-Eye-The Monochrome Vision Model-Vision Camera – **Image Sampling and Quantization:** 2-D Sampling Theory-Aliasing- Image Quantization-Lloyd-Max Quantizer-Dither-Color Images.

**UNIT II IMAGE TRANSFORMS (15 Hours)**

Introduction – Two Dimensional Orthogonal and Unitary Transforms-One Dimensional Discrete Fourier Transforms (DFT)-Properties of DFT/ Unitary DFT - 2- Dimensional DFT- Properties of 2-DDFT- Cosine Transform-Sine Transform-Walsh Transform-Hadamard Transform-Haar Transform- Slant Transform- **Karhunen-Loeve (KL) Transform:** KL Transform of Images and Properties- Singular value Decomposition transforms.

**UNIT III IMAGE ENHANCEMENT (15 Hours)**

Point Operations- Contrast Stretching-Clipping and Thresholding- Intensity Level Slicing - **Histogram Modeling:** Histogram Equalization-Histogram Modification and Histogram Specification - **Spatial Operations:** Spatial Averaging and Spatial Low-pass Filtering-Direction Smoothing- Medium Filtering- Spatial Low-pass-High-pass-Band-pass Filtering-**Transform Operations:** Generalized Cepstrum and Homomorphic Filtering-Edge enhancement using 2-D IIR and FIR filters-Color Image Enhancement.

**UNIT IV IMAGE FILTERING AND RESTORATION (15 Hours)**

Introduction - Image Observation Models- Image Formation Models-Detector and Recorder Models- Noise Models-Sampled Image Observation Models - Sources of Degradation - Inverse and Wiener Filtering - Geometric Mean Filter - Nonlinear Filters - Smoothing Splines and Interpolation- **Least Squares Filters:** Constrained Least Squares Restoration.

**UNIT V IMAGE DATA COMPRESSION AND IMAGE RECONSTRUCTION FROM PROJECTIONS (15 Hours)**

Introduction - Image Raw Data Rates-Data Compression versus Bandwidth Compression- Information Rates- Pixel Coding - Predictive Techniques - Transform Coding Theory – Hybrid Coding and Vector DPCM - Block Truncation Coding-Wavelet Transform Coding of images-Color Image Coding – Lossy and Lossless in prediction coding.

**Total Lecturer Hour=75**

## COURSE OUTCOMES

The students will be able to,

1. Explain the concepts, methods and algorithms of digital image processing
2. Understand the concepts of image transformation
3. Analyze about image enhancement, Gain the knowledge of KL transform of image.
4. Describe about image restoration, Understand the concept of image compression techniques

## TEXT BOOK(S)

1. Anil K. Jain, 2015, “Fundamentals of Digital Image Processing”, 1<sup>st</sup> Edition, Pearson Education, NewDelhi.
2. Gonzalaz R and Wintz P, 1987, “Digital Image Processing”, 2nd Edition, Addison Wesley, Baston,USA.3.Sid Ahmed M.A., 1995, “Image Processing”, McGraw Hill Inc, New York, USA.

## REFERENCE BOOK(S)

1. Jayaraman.S, Easkkirajan. S, Veerakumar.T, 2017, “Digital Image Processing”, Tata McGraw Hill Education Pvt. Ltd, India.
2. Kenneth Castleman. R, 2007, “Digital Image Processing”, First Edition, Pearson Education, India.
3. Rafael C. Gonzalez, Richard E. Woods, 2018, “Digital Image Processing”, Fourth Edition, Pearson Education, India

## E-RESOURCES

1. [https://www.iare.ac.in/sites/default/files/lecture\\_notes/DIP-LECTURE\\_NOTES.pdf](https://www.iare.ac.in/sites/default/files/lecture_notes/DIP-LECTURE_NOTES.pdf)
2. [https://mrcet.com/downloads/digital\\_notes/ECE/IV%20Year/6.Digital%20Image%20Processing.pdf](https://mrcet.com/downloads/digital_notes/ECE/IV%20Year/6.Digital%20Image%20Processing.pdf)
3. [https://www.cet.edu.in/noticfiles/272\\_Digital-Image-Processing.pdf](https://www.cet.edu.in/noticfiles/272_Digital-Image-Processing.pdf)

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3

S-Strong (3)

M-Medium (2)

L-Low (1)



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II–EC-IV (A): Human Computer Interaction**

**Ins. Hrs. /Week:5**

**Course Credit:3**

**Course Code: P24ITE24A**

**UNIT I DESIGN PROCESS**

**(15 Hours)**

Humans – Information process – Computer – Information Process – Differences and Similarities between them – Need for Interaction – Models – Ergonomics – Style – Context – Paradigms– Designing of Interactive systems – Usability – Paradigm shift – Interaction design basics – Design Process – Scenarios – Users need – Complexity of design.

**UNIT II DESIGN AND EVALUATION OF INTERACTIVE SYSTEMS**

**(15 Hours)**

Software Process – Usability engineering – Issue based Information systems – Iterative design practices – Design rules – maximum usability – Principles – Standards and guidelines – Design patterns – Programming Tools – Windowing systems – Interaction tool kit – User Interface management system – Evaluation techniques – evaluation design – Evaluating implementations – Observational Methods.

**UNIT III MODELS**

**(15 Hours)**

Universal design principles – Multimodal systems – User Support – Presentation and Implementation Issues – types – requirements – approaches – Cognitive model – Hierarchical model – Linguistic model – physical and device models – Socio-technical models – Communication and Collaboration models – Task models – Task analysis and design

**UNIT IV EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS OF HCI**

**(15 Hours)**

Basic Design structure – Single independent variable – multiple independent variable – factorial design – split-plot design – random errors – experimental procedure – Statistical analysis – T tests – Analysis of Variance test – Regression – Chi-Square test – Survey – Probabilistic sampling – Non-probabilistic sampling – developing survey questions.

**UNIT V THEORIES**

**(15 Hours)**

Dialogue notations and design – Dialogue need – dialogue design notations – Graphical – Textual – representing dialogue – formal descriptions – Dialogue analysis – System models– Interaction models– relationship with dialogue – Formalisms – Formal notations – Interstitial behavior – Virtual reality– Modeling rich interaction – Status Event analysis – Properties – Rich contexts – Sensor- based systems – Groupware – Applications – Ubiquitous computing– Virtual reality.

**Total Lecture Hours- 75**

## COURSE OUTCOMES

The students will be able to,

1. Understand the concepts of design process
2. Understand the appropriate design and evaluation of interactive systems
3. Interpret the Statistical Analysis Of HCI
4. Implement basic design and evaluation of interactive systems in HCI
5. Describe about the theories in HCI

## TEXT BOOK(S)

1. Alan Dix, Janet Finlay, 2004, Gregory Abowd, Russell Beale, Human Computer Interaction, Third Edition, Prentice Hall, Hoboken, New Jersey.
2. Jonathan Lazar, Heidi Feng, Harry Hochheiser, 2010, Research Methods in Human-Computer Interaction, Second Edition, Wiley, Hoboken, New Jersey.

## REFERENCE BOOK(S)

1. Human-Computer Interaction, 2019, Samit Bhattachatya, -Centric Computing Design, First Edition, McGraw Hill Publication, Pennsylvania Plaza New York City.
2. Ben Shneiderman and Catherine Plaisant, 2009, Designing the User Interface: Strategies for Effective Human-Computer Interaction, Fifth Edition, Addison-Wesley Publishing, Boston.
3. Martin Helander, Landauer. T.K, 1997, Handbook of Human-Computer Interaction, Second Edition, Elsevier Science Ltd, Amsterdam, Netherlands.

## E-RESOURCES

1. [https://www.iare.ac.in/sites/default/files/lecture\\_notes/HCI%20LECTURE%20NOTES.pdf](https://www.iare.ac.in/sites/default/files/lecture_notes/HCI%20LECTURE%20NOTES.pdf)
2. [https://sist.sathyabama.ac.in/sist\\_coursematerial/uploads/SIT1401.pdf](https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SIT1401.pdf)
3. <https://mrcet.com/pdf/Lab%20Manuals/IT/R15A0562%20HCI.pdf>
4. <https://www.cl.cam.ac.uk/teaching/1011/HCI/HCI2010.pdf>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
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CO2	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	1	3	3	3	2	1	3	3	3	2	3	1
CO4	3	3	3	1	3	3	3	2	3	3	3	1	3	2	3	2	3
CO5	3	1	3	3	2	3	3	3	3	3	3	3	2	3	3	3	3
	S-Strong (3)						M-Medium (2)				L-Low (1)						

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



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**SUNDARAKKOTTAI, MANNARGUDI - 614016.**

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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

**Semester: II–EC-IV (B): Computer Security and Privacy**

**Ins. Hrs. /Week: 5**

**Course Credit: 3**

**Course Code: P24ITE24B**

**UNIT I INTRODUCTION TO CYBER SECURITY**

**(15 Hours)**

Introduction -Computer Security - Threats -Harm - Vulnerabilities – Control-Authentication - Access Control and Cryptography - Web—User Side - Browser Attacks - Web Attacks-Targeting Users - Obtaining User or Website Data - Email Attacks

**UNIT II SECURITY IN OPERATING SYSTEM & NETWORKS**

**(15 Hours)**

Security in Operating Systems - Security in the Design of Operating Systems -Rootkit -Network security attack- Threats to Network Communications - Wireless Network Security - Denial of Service Distributed Denial-of-Service.

**UNIT III DEFENCES SECURITY COUNTER MEASURES**

**(15 Hours)**

Cryptography in Network Security - Firewalls - Intrusion Detection and Prevention Systems - Network Management - Databases - Security Requirements of Databases -Reliability and Integrity - Database Disclosure - Data Mining and Big Data.

**UNIT IV PRIVACY IN CYBERSPACE**

**(15 Hours)**

Privacy Concepts -Privacy Principles and Policies -Authentication and Privacy - Data Mining -Privacy on the Web - Email Security - Privacy Impacts of Emerging Technologies- Where the Field Is Headed.

**UNIT V MANAGEMENT AND INCIDENTS**

**(15 Hours)**

Security Planning - Business Continuity Planning - Handling Incidents - Risk Analysis - Dealing with Disaster - Emerging Technologies - The Internet of Things - Economics - Electronic Voting - Cyber Warfare- Cyberspace and the Law - International Laws - Cyber crime - Cyber Warfare and Home Land Security.

**Total Lecturer Hours: 75**

## COURSE OUTCOMES

The students will be able to:

1. Enrich the Knowledge about Cyber security
2. Demonstrate the Security in Operating Systems
3. Understand cryptography in network security
4. Study privacy in cyberspace
5. Able to understand cybercrime and incidents

## TEXT BOOK(S)

1. Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, Security in Computing, 5th Edition , Pearson Education , 2015
2. George K.Kostopoulos, Cyber Space and Cyber Security, CRC Press, 2013.
3. Martti Lehto, Pekka Neittaanmäki, Cyber Security: Analytics, Technology and Automation edited, Springer International Publishing Switzerland 2015

## E-RESOURCES

1. <https://crysp.uwaterloo.ca/courses/cs489/F07-lectures/lecture01.pdf>
2. <https://cups.cs.cmu.edu/soups/2005/2005tutorials/garfinkel-hour1.pdf>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
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CO2	3	1	3	3	3	2	3	3	3	3	3	3	3	2	1	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	3	3	3	3	3	3	1	3	2	3	3
CO5	3	3	2	3	3	3	3	3	1	3	3	3	3	3	3	3	2
	<b>S-Strong (3)</b>						<b>M-Medium (2)</b>				<b>L-Low (1)</b>						





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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

**Semester: II–EC-IV(C): Pervasive Computing**

**Ins. Hrs./Week:5**

**Course Credit:3**

**Course Code: P24ITE24C**

**UNIT I PERVASIVE COMPUTING**

**(15 Hours)**

Past, Present and Future Pervasive Computing-Pervasive Computing Market-m- Business-Application examples: Retail, Airline check-in and booking-Sales force automation-Health care-Tracking-Car information system-E-mail access via WAP

**UNIT II DEVICE TECHNOLOGY**

**(15 Hours)**

Hardware-Human Machine Interfaces-Biometrics-Operating Systems-Java for Pervasive devices

**UNIT III DEVICE CONNECTIVITY**

**(15 Hours)**

Protocols-Security-Device Management Web Application Concepts: WWW architecture-Protocols-Transcoding-Client authentication via internet

**UNIT IV WAP AND BEYOND**

**(15 Hours)**

Components of the WAP architecture-WAP infrastructure-WAP security issues- WML-WAP push-Products-i-Mode-Voice Technology: Basics of Speechrecognition- Voice Standards-Speech applications-Speech and Pervasive Computing

**UNIT V PDA**

**(15 Hours)**

Device Categories-PDA operation Systems-Device Characteristics-Software Components-Standards-Mobile Applications-PDA Browsers Pervasive Web Application architecture: Background-Scalability and availability-Development of PervasiveComputing web applications-Pervasive application architecture

**Total Lecture Hours- 75**

**COURSE OUTCOMES**

The students will be able to

1. Understand the fundamentals of a Pervasive Computing.
2. Get knowledge about the Hardware and Software for Pervasive Computing.
3. Understand the architecture and Protocols for Pervasive Computing.
4. Understand the WAP Infrastructure and security issues.
5. Know the concepts of PDA and Pervasive Web application architecture.

### TEXT BOOK(S)

1. Pervasive Computing, Technology and Architecture of Mobile Internet Applications, Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaech & Klaus Rindtorff, Pearson Education, 2006

### REFERENCE BOOK(S)

1. Fundamentals of Mobile and Pervasive Computing, Frank Adelstein, Sandeep KS Gupta, Golden Richard III, Loren Schwiebert, McGraw Hill edition, 2006

### E-RESOURCES

1. <https://lecturenotes.net/home/view2/fundamentals-of-pervasive-computing-lecture-notes/8849>
2. <https://csenotescorner.blogspot.com/2018/01/cp5093-mobile-and-pervasive-computing.html>
3. <https://www.itu.int/en/Lists/consultation2015/Attachments/41/45.3104.pdf>

### COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
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CO2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3
CO3	3	3	3	2	3	3	3	3	2	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	2	3	3	3	3	3	3	2	3	3

S-Strong (3)

M-Medium (2)

L-Low (1)



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE  
M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II VAC-I Green Computing**

**Ins. Hrs. /Week: 2**

**Course Credit: 2**

**Course Code: P24ITVA21**

**UNIT-I: OVERVIEW AND ISSUES**

**(6 hours)**

Introduction- An overview and Issues related to it: Problems- Toxins- Power Consumption- Equipment Disposal- Company's Carbon Footprint- Measuring and Exercising projects- Define your Borders- Set a Baseline- How to track and analyze data- Other ways to reduce the occurring issues- Hardware- Power. Current Initiatives and Standards: Global Initiatives- Task Forces.

**UNIT -II: MINIMIZING POWER USAGE**

**(6 hours)**

Objectives- Introduction- Power Problems- Monitoring Power Usage- Servers- Low-Cost Options- Reducing Power Use- Data De-duplication- Virtualization- Management- Bigger Drives- Involving the Utility Company- Low-Power Computers- PCs, Linux- Components- Servers- Computer Settings- Storage- Monitors- Power Supplies- Wireless Devices- Software.

**UNIT -III: CHANGING THE WAY OF WORK**

**(6 hours)**

Objectives-Old Behaviors- Starting at the Top-Process Reengineering with Green in Mind- Analyzing the Global Impact of Local Action-. Steps: Water- Recycling-Energy-Pollutants- Teleworkers and Outsourcing: Telecommuting-Outsourcing-How to Outsource.

**UNIT -IV: GOING PAPERLESS**

**(6 hours)**

Objectives-Paper Problems-Paper and Office- Going Paperless-Organizational Realities-Changing Over-Paperless Billing-Handheld Computers vs. the Clipboard-Unified Communications-Intranets- Building an Intranet-Microsoft Office SharePoint Server 2007-Electronic Data Interchange (EDI)- Nuts and Bolts- Value Added Networks-Advantages-Obstacles.

## UNIT V: GREENING YOUR INFORMATION SYSTEMS

(6 hours)

Introduction-Initial Improvement Calculations-Selecting Metrics- Tracking Progress-Change Business Processes- Paper Reduction- Green Supply Chain-Improve Technology Infrastructure-. Reduce PCs and Servers-Shared Services-Hardware Costs-Cooling.

**Total Lecturer Hours: 75**

### COURSE OUTCOMES

1. Understand the overview and Issues in Green Computing
2. Implement the Virtualization using minimize the duplication.
3. Understand the Process Reengineering with Green Computing.
4. Implement methodology for Going Paperless
5. Analyze the Green supply chain technology.

### TEXT BOOK(S)

1. Toby Velte,Anthony Velte,Robert Elsenpeter,"Green IT",McGraw Hill,2008.
2. Alvin Galea,Michael,Mike Ebbers "Green Data Center: Steps for Journey"Shroff Publishers and Distributers,2011.

### REFERENCE BOOK(S)

1. Bud E.Smith,"Green Computing Tools and Techniques for Saving Energy", Money andResources, CRC Press 2014.
2. Salahudin S.Sajan,"Introduction to Green Computing", Published by :NIRALI PRAKASHAN, Feb2019.

### E-RESOURCES

1. <https://old.mu.ac.in/wp-content/uploads/2021/06/USIT205-Green-Computing.pdf>
2. <https://www.himpub.com/documents/Chapter1765.pdf>

### COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
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CO2	3	3	3	1	3	3	3	3	3	1	3	3	1	3	1	3	3
CO3	3	3	2	3	3	3	3	1	3	3	3	3	3	3	3	3	2
CO4	1	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	3
CO5	3	1	3	3	3	1	3	3	3	3	2	3	3	1	3	3	3

**S-Strong (3)**

**M-Medium (2)**

**L-Low (1)**

**NME OFFERED BY THE DEPARTMENT**



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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

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**Semester: I NME-I Web Design**

**Ins. Hrs. /Week: 2**

**Course Credit: 2**

**Course Code:P24NMEIT11**

**UNIT I Web Design Principles (6 hours)**

Basic principles involved in developing a web site -Planning process - Five Golden rules of web designing - Designing navigation bar - Page design - Home Page Layout - Design Concept.

**UNIT II Basics in Web Design (6 hours)**

Brief History of Internet - What is World Wide Web - Why create a web site - Web Standards.

**UNIT III Introduction to HTML (6 hours)**

What is HTML - HTML Documents - Basic structure of an HTML document - Creating an HTML document -

**UNIT IV HTML Tags (6 hours)**

Mark up Tags - Heading -Paragraphs - Line Breaks -HTML Tags. **Elements of HTML:**  
Introduction to elements of HTML -Working with Text - Working with Lists.

**UNIT V HTML Controls (6 hours)**

Tables and Frames - Working with Hyperlinks, Images and Multimedia - Working with Forms and controls.

**Total Lecturer Hours: 30**

**COURSE OUTCOMES**

1. Understand the Internet Concepts and its Technologies.
2. Describe importance of HTML Tags using Designing Home Page.
3. Use and Examine Ordered and Unordered Lists using HTML Documents.
4. Understand the Table Handling , Frames and Forms in web page
5. Understand the concepts of CSS using in Web Page.

## TEXT BOOK(S)

- 1 .Kogent Learning Solutions Inc. HTML 5 in simple steps Dreamtech Press A beginner's guide to HTML NCSA,14th May,2003
2. Murray,Tom/Lynchburg Creating a Web Page and Web Site College,2002

## REFERENCE BOOK(S)

- 1 . Steven M. Schafer HTML, XHTML, and CSS Bible, 5ed Wiley India John Duckett Beginning HTML, XHTML, CSS, and JavaScript Wiley India.

## E-Resources:

1. <https://bit.ly/3e6ZrS>
2. <https://bit.ly/3h4e0bp>
3. <https://bit.ly/2QAZa1d>

## COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

**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 AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

**M.Sc., INFORMATION TECHNOLOGY**

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**Semester: II NME-II Multimedia and its Applications**

**Ins. Hrs. /Week: 2**

**Course Credit: 2**

**Course Code: P24NMEIT22**

**UNIT I Introduction**

**(6 hours)**

What is Multimedia?–Introduction to making Multimedia–Macintosh and Windows  
Production platforms – Basic Software tools.

**UNIT II Multimedia Tools**

**(6 hours)**

Making Instant Multimedia–Multimedia authoring tools–Multimedia building blocks–Text– Sound.

**UNIT III Animation**

**(6 hours)**

Images–Animation–Video.

**UNIT IV Internet**

**(6 hours)**

Multimedia and the Internet–The Internet and how it works–Tools for World Wide Web–  
Designing for the World Wide Web.

**UNIT V Multimedia Systems**

**(6 hours)**

High Definition Television and Desktop Computing –Knowledge based Multimedia systems.

**Total Lecturer Hours: 30**

**COURSE OUTCOMES**

1. Describe the Software tools and objects of Multimedia systems.
2. Implement various multimedia tools.
3. Use Animation Tools in Multimedia Applications.
4. Recognize the applications of Multimedia in Internet.
5. Understand the Multimedia Systems in Desktop Computing.

**TEXT BOOK**

1. TayVaughan, “Multimedia making it work”,Fifth Edition,Tata McGraw Hill.
2. JohnF.Koegel Bufford,“Multimedia Systems”, Pearson Education.

**REFERENCE BOOK**

1. Judith Jeffloate,“Multimedia in
2. Practice(TechnologyandApplications)”,PHI,2003.

**E-RESOURCES**

1. [https://www.w3schools.com/html/html\\_media.asp](https://www.w3schools.com/html/html_media.asp)
2. [https://www.tutorialspoint.com/html/html\\_embed\\_multimedia.htm](https://www.tutorialspoint.com/html/html_embed_multimedia.htm)



**COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)**

COURSE OUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

**S-Strong (3)**

**M-Medium (2)**

**L-Low (1)**