

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SILVER JUBILEE INSTITUTION

(Affiliated to Bharathidasan University)

(Accredited by NAAC)

SUNDARAKKOTTAI, MANNARGUDI – 614016, TAMILNADU, INDIA.



M.Sc., INFORMATION TECHNOLOGY

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK(CBCS-LOCF)

(For the candidates admitted in the academic year 2025-2026)

PROGRAMME CODE

2PSINT



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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 2025-2026)

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, Practical) 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	
END SEMESTER EXAMINATIONS (ESE)	20	25			30		75
Continuous Internal Assessment (CIA)	20	25			30		75

QUESTION PATTERN FOR END SEMESTER EXAMINATION/ Continuous Internal Assessment

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

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

EVALUATION

GRADING SYSTEM

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

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

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

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

CLASSIFICATION OF FINAL RESULTS:

- 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

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

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

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

* 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	Disciplinary Knowledge: 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	Critical Thinking and Problem Solving: 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	Information/digital literacy and Communication Skills: 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	Research-related skills: 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	Scientific reasoning and Reflective Thinking: 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	Multidisciplinary Approach, Innovation and Entrepreneurship: 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	Moral and ethical awareness/reasoning: 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	Self directed Learning: work independently, identify appropriate resources required for a project, and manage a project till completion.
PO-9	Lifelong Learning: 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	Multicultural Competence, Social Interaction and Effective Citizenship: 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

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



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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 2025-2026)

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	P25IT101	Open-Source Technologies	6	4	1	-	1	5	3	25	75	100
		Core Course- II	P25IT102	Python programming	6	4	1	-	1	5	3	25	75	100
		Core Practical- I	P25IT103P	Python Programming Lab	6	-	-	6	-	3	3	25	75	100
	Part B(i)	Elective Course- I	P25ITE11A P25ITE11B P25ITE11C	Mobile Computing/ Intelligent Agents/ Social Networking	5	4	1	-	-	3	3	25	75	100
		Elective Course- II	P25ITE12A P25ITE12B P25ITE12C	Internet of Things/ Social Media Mining/ Object Oriented Systems Development	5	4	1	-	-	3	3	25	75	100
	Part B (ii)	NME-I			2	1	1	-	-	2	3	25	75	100
				TOTAL	30	17	5	6	2	21	-	-	-	600

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	P25IT204	Advanced Database Systems	6	4	1	-	1	5	3	25	75	100
		Core Course - IV	P25IT205	Cryptography and Network Security	6	4	1	-	1	5	3	25	75	100
		Core Practical- II	P25IT206P	RDBMS Lab	6	-	-	6	-	3	3	25	75	100
	Part B(i)	Elective Course- III	P25ITE23A/ P25ITE23B/P25ITE23C	Malware Analysis/ Digital Watermarking and Steganography/ Digital Image Processing	5	4	1	-	-	3	3	25	75	100
		Elective Course- IV	P25ITE24A/ P25ITE24B/ P25ITE24C	Human Computer Interaction/ Cloud Security/ Pervasive Computing	5	4	1	-	-	3	3	25	75	100
	Part B (ii)	NME-II			2	1	1	-	-	2	3	25	75	100
					TOTAL	30	17	5	6	2	21	-	-	-
III	Part A	Core Course-V	P25IT307	.NET Programming	6	4	1	-	1	5	3	25	75	100
		Core Course- VI	P25IT308	Advanced Software Engineering	6	4	1	-	1	5	3	25	75	100
		Core Practical -III	P25IT309P	.NET Programming Lab	6	-	-	6	-	3	3	25	75	100
		Core Industry Module	P25ITI31	Data Analytics	5	4	1	-	-	3	3	25	75	100
	Part B (i)	Elective Course- V	P25ITE35A/ P25ITE35B/ P25ITE35C	Software Testing with selenium / Intelligent Systems / Research Methodology	5	4	1	-	-	3	3	25	75	100
	Part B (ii)	Skill Enhanceme nt Course	P25SEIT31	Node JS	2	1	1	-	-	2	3	25	75	100
	Part B (iii)	P25ITIA31		Internship/ Industrial Activity	-	-	-	-	-	2	-	-	-	-
TOTAL					30	17	5	6	2	23	-	-	-	600

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	P25IT410	J2EE Technologies	5	3	1	-	1	5	3	25	75	100
		Core Course-VIII	P25IT411	Artificial Intelligence and Machine Learning	5	3	1	-	1	5	3	25	75	100
		Core Practical -IV	P25IT412P	J2EE Technologies Lab	6	-	-	6	-	3	3	25	75	100
		Core Project	P25ITPW	Project with Viva-Voce	8	-	2	6	-	7	3	25	75	100
	Part B (i)	Elective Course-VI (Industry/Entrepreneurship)	P25ITE46A / P25ITE46B / P25ITE46C	Virtual and Augmented Reality / Trends in Computing / Robotics Process Automation for Business	4	3	1	-	-	3	3	25	75	100
	Part B (ii)	Professional Competency Course	P25PCIT41	Computer Science for NET/SET	2	1	1	-	-	2	3	25	75	100
	Part C	P25ITEA		Extension Activity	-	-	-	-	-	1	-	-	-	-
		TOTAL			30	10	6	12	2	26	-	-	-	600
		GRAND TOTAL			120	61	21	30	8	91	-	-	-	2400
* Extra Credit				MOOC /SWAYAM/ NPTEL (Optional)	-	-	-	-	-	2	-	-	-	-
				Value Added Courses (Atleast one per year)	-	-	-	-	-	2	-	-	-	-

L - Lecture

T-Theory

P-Practical

S-Seminar

CREDIT DISTRIBUTION FOR M.Sc., INFORMATION TECHNOLOGY

S. No	Part	Subject	Total Course	Total Credits
1	Part A	Core Course	8	40
2		Core Practical	4	12
3		Core Project Work VIVA VOCE	1	7
4		Core Industry Module	1	3
5	Part B (i)	Elective Course	6	18
6	Part B (ii)	Non-Major Elective	2	4
7		Skill Enhancement Course	1	2
8		Professional Competency Course	1	2
9	Part B (iii)	Internship	1	2
10	Part C	Extension Activity	1	1
Total			26	91

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

Semester	Part	Course	Course Code	Title of the Paper
I	Part B (ii)	NME-I	P25NMEIT11	Web Design
II		NME-II	P25NMEIT22	Multimedia and its Applications

SEMESTER III

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(For the candidates admitted in the academic year 2025 – 2026)

PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

M.Sc., INFORMATION TECHNOLOGY

Semester: III–CC-V: .NET PROGRAMMING

Ins. Hrs. /Week:6

Course Credit:5

Course Code: P25IT307

UNIT -I: INTRODUCTION

(21 Hours)

Introduction to distributed Computing – Challenges involved in establishing remote connection: Heterogeneity-Openness-Security-Scalability-Failure Handling-Concurrency-Transparency-Strategies involved in remote computation: RCS – Current Distributed computing practices through Dot Net and Java technologies.

UNIT- II: OVERVIEW OF ASP.NET

(19 Hours)

The .NET framework – Learning the .NET languages Data types -Declaring variables Scope and Accessibility -Variable operations- Object Based manipulation- Conditional Structures- Loop Structures- Functions and Subroutines

UNIT-III: FEATURES OF ASP.NET

(16 Hours)

Types, Objects and Namespaces- The Basics about Classes- Value types and Reference types- Advanced class programming- Understanding name spaces and assemblies-Setting Up ASP.NET and IIS.

UNIT-IV: ADVANCED FEATURES OF ASP.NET

(18 Hours)

AdRotator- Multiview- Wizard -Image Map Controls – calendar control-Panel Control-Master Pages – Site Navigation--Web Parts--Uses of these controls and features in Website development Security in ASP.NET– State Management in ASP.NET–Mobile Application development in ASP.NET.

UNIT- V: ADVANCED ADO.NET

(16 Hours)

Disconnected Data Access- .NET Framework Data Providers- The Dataset – Grid view controls- Details View Controls-Form View controls-Crystal Reports: Implementation Models- The Pull Method- The Push Method- Crystal Reports Types–Role of ADO.NET in Distributed Applications: Advantages and innovations in ADO.NET technology.

Total Lecture Hours- 90

COURSE OUTCOME

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

1. Understand the basics of Distributed Computing.
2. Apply the basics concepts of .NET Technologies in Distributed Computing.
3. Interprets the concepts of .Net Frameworks
4. Understand the controls and features in Website Development
5. Summarize the advanced features of ASP.NET required for Distributed Technologies.

TEXT BOOKS

1. Kumar. B.V, Subrahmanya S.V, 2012, “Web Services: An Introduction”, McGraw Hill Education, India.
2. Mathew Mac Donald, 2005, “ASP.NET Complete Reference”, McGraw Hill Education, India.
3. Stephen Walther, 2011, “ASP.NET 3.5”, SAMS Publication, Indianapolis, Indiana.

REFERENCE BOOK(S)

1. Barnaby, Tom, 2002, “Distributed .NET Programming in C#”, APress, New York, United States.
2. Pradeep Tapadiya, 2002 “.NET Programming: A Practical Guide Using C#” (Hewlett- Packard Professional Books)
3. Stephen Walther, Kelvin Hoffman, Nate Dudek, 2009, “ASP.NET 4.0”, SAMS Publication, Indianapolis, Indiana.

E_RESOURCES

1. <https://www.tutorialspoint.com/Distributed-Systems>
2. https://books.google.co.in/books/about/ASP.NET_4_Unleashed.html?id=3nmHmAEACAAJ
3. <https://books.google>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	3	3	2	3	3	3	2	2	3	2	3	2	3	2	2	3
CO2	2	3	2	3	2	3	2	3	3	2	3	2	2	2	3	3	2
CO3	2	3	2	3	2	3	2	3	3	2	3	2	3	2	3	3	2
CO4	3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	2	3
CO5	3	3	3	2	3	3	3	2	3	3	3	3	3	3	2	2	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: III-CC-VI ADVANCED SOFTWARE ENGINEERING

Ins. Hrs. /Week:6

Course Credit:5

Course Code:P25IT308

UNIT- I: NEED FOR S/W ENGINEERING

(19 Hours)

About software and S/w engineering – A systems approach – Engineering approach – Members of the development team – Change in S/w engineering. - **Modeling the process and Life cycle:** The meaning of process – S/w process models– Tools and techniques for projects modeling – Practical process modeling.

UNIT- II: PLANNING AND MANAGING THE PROCESS

(20 Hours)

Tracking progress -Milestones-Difference between milestone and activity- Work breakdown and Activity Graphs- Activity Graph- Estimating completion- Tools to track progress-**Project personnel:** Staff roles and characteristics- Work styles- Rational extroverts- **Project Organization:** Chief programmer team- Egoless Approach-**Effort estimation:** Facilities Expert Judgement- Delphi Technique- Algorithmic Methods- COCOMO Model- Machine learning methods - **Risk management:** Risk Management Activities -The project plan-process models and project management.

UNIT- III: CAPTURING THE REQUIREMENTS

(17 Hours)

The requirement process – Types of Requirements – Characteristics of requirements – Modeling Notations- Prototyping requirements – Requirements Documentation – validation and verification – Measuring requirements – Choosing a requirements specification Techniques.

UNIT- IV: DESIGNING THE SYSTEM

(17 Hours)

Design Introduction - Modeling the Architectures-Decomposition and views – Architectural styles and strategies – Achieving Quality Attributes-Collaborative Design - Architectural Evaluation and Refinement - Documenting software Architectures – Programming standards and procedures – Programming guidelines – Documentation.

UNIT- V: SOFTWARE TESTING AND MAINTENANCE

(17 Hours)

Testing strategic issues – Test strategies for conventional S/w – Test strategies for object-oriented S/w – Validation testing – System testing – S/w testing. Fundamentals – Black-box and White-box testing – White box testing – Black box testing – McCall's Quality factors – ISO 9126 - QF- S/w engineering – S/w Maintenance.

Total Lecture Hours : 90

COURSE OUTCOME

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

- 1 Describe software engineering layered technology and Process frame work
- 2 Analyze the role of project management including planning, scheduling, risk management, etc.
- 3 Analyze implementation issues such as modularity and coding standards.
- 4 Understand of approaches to verification and validation including static analysis, and reviews.
- 5 Understand of software testing approaches such as unit testing and integration testing.

TEXT BOOKS

1. Roger S. Pressman, "Software Engineering A Practitioner's Approach", 6th Edition, TataMcGraw Hill Publication, New Delhi, India.
2. Shari Lawrence P. Fleeger, "Software Engineering Theory and Practice", 2nd Edition, Pearson Education, Delhi, 2001.

REFERENCE BOOK(S)

1. Douglas Bell, "Software Engineering for Students-A Programming Approach", 4th Edition, Pearson Education, Delhi, 2007.
2. Ian Sommerville, "Software Engineering", 6th Edition, Pearson Education, Delhi, 2005.
3. Rajib Mall, "Fundamentals of Software Engineering", 5th Edition, PHI learning, Delhi.

E_RESOURCES

1. https://books.google.com/books/about/Software_Engineering.html?id=fadQAAAAMAAJ
2. <http://hello.joolz.com/download/pressman-r-software-engineering-a-practitioners-approach-7th-edition-tata-mcgraw-hill-book-pdf>
3. <https://www.tutorialspoint.com/sdlc/index.html>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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

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 2025 – 2026)
PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE
M.Sc., INFORMATION TECHNOLOGY

Semester: III-CP .NET PROGRAMMING LAB

Ins. Hrs. /Week: 6

Course Credit: 3

Course Code: P25IT309P

EXERCISES

- 1) Create a web page that Make use of Image Control involving two hot spots.
- 2) Design a web page for Advertisement that makes uses of Ad Rotator Control.
- 3) Design a web page to display five forest Images involving Multi View Control
- 4) Design a web page involving Wizard Control.
- 5) Design a simple web site for software companies that make use of Master Pages.
- 6) Develop a form in VB.NET to pick a date from Calendar control and display the day, month and year details in separate text boxes.
- 7) Develop Website using sitemap Concept
- 8) Create a website for a College to establish the security features with five pages.
- 9) Create a table and insert a few records using Disconnected Access.
- 10) Develop a project to view the records using Grid View, Details View, Form View Controls.

Total Lecture Hours-90

COURSE OUTCOME

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

1. Develop a project in scripting language.
2. Design a webpage using various controls.
3. Create a report using existing Database.
4. Implement a web service using ASP.NET.
5. Demonstrate the fundamental concept of Internet, ASP.Net with a view to developing professional software development skills.

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	2	3
CO2	2	3	2	3	2	3	2	3	3	2	3	2	3	2	3	3	2
CO3	2	3	2	3	2	3	2	3	3	2	3	2	3	2	3	3	2
CO4	3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	2	3
CO5	3	3	3	2	3	3	3	2	3	3	3	3	3	3	2	2	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: III - Core Industry Module - DATA ANALYTICS

Ins.Hrs./Week: 5

Course Credit: 3

Course Code: P25ITI31

UNIT- I: TYPES OF DIGITAL DATA

(13 Hours)

Data, Characteristics of data and Types of digital data: Unstructured, Semi-structured and Structured, Sources of data, Working with unstructured data, Evolution and Definition of big data, Characteristics and Need of big data, Challenges of big data, Data environment versus big data environment.

UNIT- II: DATA ANALYTICS

(16 Hours)

Overview of business intelligence, Data science and Analytics, Meaning and Characteristics of big data analytics, Need of big data analytics, Classification of analytics, Challenges to big data analytics, Importance of big data analytics, Basic terminologies in big data environment.

UNIT- III: BIG DATA TECHNOLOGIES AND DATABASES

(15 Hours)

Introduction to NoSQL, Uses, Features and Types, Need, Advantages, Disadvantages and Application of NoSQL, Overview of NewSQL, Comparing SQL, NoSQL and NewSQL, Introduction to MongoDB and its needs, Characteristics of MongoDB, Introduction of apache Cassandra and its needs, Characteristics of Cassandra.

UNIT- IV: HADOOP FOUNDATION FOR ANALYTICS

(15 Hours)

History, Needs, Features, Key advantage and Versions of Hadoop, Essential of Hadoop ecosystems, RDBMS versus Hadoop, Key aspects and Components of Hadoop, Hadoop Architectures.

UNIT- V: HADOOP MAPREDUCE AND YARN FRAMEWORK

(16 Hours)

Introduction to MapReduce, Processing data with Hadoop using MapReduce, Introduction to YARN, Components, Need and Challenges of YARN, Dissecting YARN, MapReduce application, Data serialization and Working with common serialization formats, Big data serialization formats.

Total Lecture Hours:75

COURSE OUTCOME

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

1. Outline the basics in data science
2. Demonstrate the knowledge of data analysis techniques in decision making
3. To understand, illustrate and evaluate the concepts and techniques of Data Science, Big Data Analytics and its tools

4. To collaborate, apply and review the computing for big data in Hadoop, and NoSQL environment
5. To comprehend, implement and review the concepts of data science and big data analytics projects using MapReduce, MongoDB, HIVE and PIG

TEXT BOOKS

1. Seema Acharya and Subhashini Chellappan, "Big Data and Analytics", Wiley India Pvt. Ltd., 2016.

REFERENCE BOOK(S)

1. Anand Rajaraman, Jure Leskovec, Jeffery D. Ullman "Mining of Massive Datasets", Springer, July 2013.
2. Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman, "Big Data" Wiley Publications, 2014.
3. Mohanty, Madhu Jagadeesh and Harsha Srivatsa, Apress Media, Springer Science + Business Media New York, 2013
4. Soumendra "Big Data Imperatives : Enterprise Big Data Warehouse, BI Implementations and Analytics"
5. Tom White, "Hadoop: The definitive Guide", O'Reilly Media, 2010.

E-RESOURCES

1. <http://www.theartling.com/text/dmwhite/dmwhite.htm>
2. <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=AD0770256>
3. <https://www.datamentor.io/r-programming#tutorial>
4. <http://www.csis.pace.edu/~ctappert/cs816-15fall/books/2015DataScience&BigDataAnalytics.pdf>
5. <http://www.rdatamining.com/>
6. <https://www.analyticsvidhya.com/blog/2016/02/complete-tutorial-learn-data-science-scratch/>
7. https://www.tutorialspoint.com/data_mining/dm_classification_prediction.htm
(Classification)

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	3	2	2	3	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	2
CO3	3	2	3	3	2	2	3	3	3	3	2	3	2	2	2	2	3
CO4	3	3	3	3	3	3	2	2	3	2	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	2	3	3	3	2	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: III-EC-V(A) – SOFTWARE TESTING WITH SELENIUM

Ins. Hrs. /Week: 5

Course Credit: 3

Course Code: P25ITE35A

UNIT I: INTRODUCTION TO SOFTWARE TESTING

(15 Hours)

Software Testing Fundamentals: Introduction to software testing – need for testing – testing principles – errors, bugs and defects – verification and validation – SDLC and STLC – testing levels and testing types – test case design techniques – test plan, test scenario, test case, test data – test environment. Test Automation Basics: Automation testing vs manual testing – benefits and limitations of automation – selection of test cases for automation – introduction to test automation tools – overview of Selenium and its role in automation testing.

UNIT II: SELENIUM IDE,WEBDRIVER BASICS & LOCATORS

(15 Hours)

Introduction to Selenium: Selenium suite components – Selenium IDE, Selenium WebDriver, Selenium Grid – browser support and architecture. WebDriver Basics: Setting up Selenium environment – project creation – browser launch and management – navigation commands – handling basic browser operations.

Locators and Element Interaction: HTML basics – locating web elements using id, name, class name, tag name, link text, partial link text, CSS selectors and XPath – handling input fields, buttons, checkboxes, radio buttons, dropdowns, alerts and frames.

UNIT III: ADVANCED SELENIUM WEBDRIVER

(15 Hours)

Synchronization in Selenium: Implicit wait – explicit wait – fluent wait – handling dynamic web elements. Advanced Element Handling: Web tables – mouse actions – keyboard actions – drag and drop – screenshots – file upload/download – handling multiple windows and tabs. Test Automation Framework Basics: Introduction to framework design – reusable functions – modular and data-driven testing – debugging and logging – introduction to assertions and validation.

UNIT IV:TESTNG, DATA DRIVEN TESTING

(15 Hours)

TestNG Framework: Introduction to TestNG – annotations – test execution order – assertions – grouping – dependencies – parameters – parallel test execution – test suites and test reports. Data-Driven Testing: Reading test data from Excel/CSV/files – parameterization using TestNG –basics of Apache POI. Frameworks: Introduction to automation frameworks – keyword-driven framework – hybrid framework – Page Object Model (POM) – Page Factory – Maven project structure – integrating Selenium with TestNG and build tools.

UNIT V: SELENIUM GRID, CI/CD & REAL-TIME PROJECT

(15 Hours)

Selenium Grid: Need for distributed testing – Grid architecture – hub and nodes – remote execution–cross-browser testing. Integration and Execution: Introduction to CI/CD – Jenkins integration – running Selenium tests from command line and build tools–version control with Git. Project Work: Designing and executing a real-time test automation project – selecting application under test – test case automation – reporting – defect logging – maintenance of test scripts – best practices and challenges in Selenium automation.

Total Lecture Hours: 75

COURSE OUTCOME

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

1. Understand the fundamentals of software testing and test automation.
2. Develop automation scripts using Selenium WebDriver.
3. Apply locators, waits, and advanced WebDriver handling techniques.
4. Build and execute automated test suites using TestNG and frameworks.
5. Integrate Selenium with Grid, Jenkins, and implement a real-time automation project.

TEXT BOOKS

1. Alan Richardson, Selenium WebDriver 3 Practical Guide, Packt Publishing.2007
2. Unmesh Gundecha, Selenium WebDriver 3.0 Beginner's Guide, Packt Publishing.2018
3. Applitools/Packt references on Selenium automation frameworks and testing practices.2016

REFERENCE BOOK(S)

1. Rex Black, Foundations of Software Testing, Cengage Learning.
2. Paul Ammann and Jeff Offutt, Introduction to Software Testing, Cambridge University Press.

E-RESOURCES

1. Selenium Official Documentation – <https://www.selenium.dev/documentation/>
2. TestNG Documentation – <https://testng.org/doc/>
3. Apache POI – <https://poi.apache.org/>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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

S-Strong (3)

M-Medium (2)

L-Low (1)

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

Semester: III-EC-V(B) - INTELLIGENT SYSTEMS

Ins. Hrs. /Week: 5 Course Credit: 3 Course Code: P25ITE35B

UNIT -I : ARTIFICIAL INTELLIGENCE (15 Hours)

AI problems-AI technique-**Problem Search**:-Production Systems –Problem Characteristics –Production system characteristics- **Heuristic Search techniques**: Generate and Test – Hill Climbing – Constraint Satisfaction, Means-end analysis.

UNIT- II: KNOWLEDGE REPRESENTATION ISSUES (15 Hours)

Representations and mappings – Approaches to Knowledge representations --Frame problem -. **Using Predicate Logic**: Representing simple facts in logic - Representing Instance and ISA relationships – Computable functions and predicates – Resolution.

UNIT -III: REPRESENTING KNOWLEDGE USING RULES (15 Hours)

Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge. **Knowledge representation summary**: Syntactic and Semantic

spectrum of representation-Logic and slot – and-filler structures-Other representational techniques.

UNIT -IV: RULE-BASED EXPERT SYSTEMS (15 Hours)

Introduction- Rules as a knowledge representation technique- players- Structure- Forward chaining and backward chaining inference techniques- **Fuzzy expert systems**: Introduction- Fuzzy sets- Linguistic variables and hedges- Operations - Fuzzy rules- - Building a fuzzy expert system.

UNIT- V: ARTIFICIAL NEURAL NETWORKS (15 Hours)

Neuron- perceptron- Multilayer neural networks- - The Hopfield network- **Robotics**: Introduction-Robot hardware-Perception-Moving-Robotic software architecture.

Total Lecture Hours: 75

COURSE OUTCOME

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

1. Enhance the Knowledge.
2. Understand the Problem Solving,
3. Implement Analytical ability and Professional Competency.
4. Evaluate Professional Communication .
5. Create and implement Transferrable Skill.

TEXT BOOKS

1. Elaine rich and Kelvin Knight, “Artificial Intelligence “, Tata McGraw hill Publication, 3rd Edition, 2009.
2. Michael Negnevitsky, Addison Wesley, Artificial Intelligence: A Guide to Intelligent Systems, 3rd edition, 2011.
3. Stuart Russell & Peter Norvig, Artificial Intelligence a modern Approach “3rd Edition Pearson Education

REFERENCE BOOK(S)

1. George F Luger , “Artificial Intelligence “, 4th Edition , Pearsons Education Publ, 2002.
2. Stuart Russell & Peter Norvig, “Artificial Intelligence a modern Approach “–3rd Edition, Pearson Education.
3. V S Janaki Raman, KSarukesi, P Gopalakrishnan, “Foundations of Artificial Intelligent And Expert Systems”, Macmillan India Limited

E-RESOURCES

1. <https://www.techopedia.com/definition/190/artificial-intelligence-ai>
2. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligent_systems.htm
3. <https://data-flair.training/blogs/heuristic-search-ai/>
4. <http://teaching.csse.uwa.edu.au/units/CITS7212/Lectures/Students/Fuzzy.pdf>
5. <http://engineering.nyu.edu/mechatronics/smart/pdf/Intro2Robotics.pdf>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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

S-Strong (3)

M-Medium (2)

L-Low (1)



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M.Sc., INFORMATION TECHNOLOGY

M.Sc., INFORMATION TECHNOLOGY

Semester: III-EC-V(C) - RESEARCH METHODOLOGY

Ins. Hrs. /Week: 5

Course Credit:3

Course Code: P25ITE35C

UNIT- I: RESEARCH FUNDAMENTALS

(15 Hours)

Motivation and Objectives – Research Methods and Methodology - Research types – Descriptive Vs Analytical, Applied Vs Fundamental, Quantitative Vs Qualitative, Conceptual Vs Empirical, concept of applied and Basic research process – Criteria of good Research.

UNIT-II: RESEARCH FORMULATION AND PROBLEMS

(15 Hours)

Defining and formulating the Research problem – Selecting the problem – Necessity of defining the problem – Importance of Literature review in defining a problem – Literature collection - Literature review – Primary and secondary sources – Reviews – Monograph – Patents – Research Databases – Web as a source – Searching the web – Critical literature review – Identifying gap areas from literature and research database, Development of working hypothesis.

UNIT- III: THESIS WRITING

(15 Hours)

Writing review and journal articles – manuscript publication - **Thesis Writing:** Planning a thesis – general format – page and chapter format – footnotes – tables and figures– references and appendices. Research Tools in Computer Science: LaTeX, R, WEKA, MATLAB, NS2. **Copy Editing:** Introduction to Copyediting, Objectives of Copyediting– correctness, consistency, coherence and clarity–Editing your own paper: Fixing grammar and usage errors, basic punctuation, consistent style and clear sentences–creating and using a style sheet for effective copyediting–Tools–Ms Editor, Grammarly, Quillbot.

UNIT-IV:RESEARCH ETHICS

(15 Hours)

Philosophy - Definition, nature, scope and concept - Ethics – definition, moral philosophy, nature of moral judgments and reactions - Ethics with respect to science and research- Scientific misconducts– falsification, fabrication and plagiarism software – Turnitin, Urkund and other open source software tools - Redundant publications–duplicate and overlapping publications - Publication ethics- definition and importance. Publication misconduct–definition, concept, problems that lead to unethical behavior, types, Violation of publication ethics, authorship and contributor ship - Software tool to identify predatory publications developed by SPPU - Subject specific ethical issues–authorship, Conflicts of interest.

UNIT-V:ETHICS IN INFORMATION TECHNOLOGY

(15 Hours)

Overview of Ethics: Definition of Ethics - The Importance of Integrity - The Difference Between Morals, Ethics, and Laws - Ethics in the Business World - Corporate Social - Improving Corporate Ethics Creating an Ethical Work Environment - Ethics in InformationTechnology – **Ethics for IT Workers and IT users:** IT Professionals -

Total Lecture Hours : 75

COURSE OUTCOME

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

1. Understand the basic concepts of research and its types
2. Analyze the research problems in the real world scenario
3. Understand scholarly writing and development of the skills to write the same
4. Use tools related to research in Computer Science and art of thesis writing
5. Apply the research ethics and publication ethics in Information technology to justify the morals of professional ethics

TEXT BOOKS

1. Garg B.L.Karadia, R.Agarwal, F and Agarwal, "An Introduction to Research Methodology" RBSA Publishers, U.K., 2002
2. George Reynolds, "Ethics in Information Technology" Thompson Course Technology, 2007 ISBN 13:978- 1-4188-3631-3
3. Kothari C.R. Research Methodology – methods and techniques, 2nd Edition, Wishwa Prakashjan NewDelhi, 1999.
4. Sinha.S.C, and Dhiman A.K, , " Research Methodology", Ess Ess Publications- Second Volume, 2002.
5. Vivek Kumar K.P. Eashwar, "Discover the editor in you" ,Saurph Printers,2023.

REFERENCE BOOK(S)

1. Anderson, Durston and Poole, 'Thesis and Assignment writing', Wiley Eastern Ltd.ND, 1970.
2. Misra R.P. Research Methodology–A Hand Book, Concept publishing Company, NewDelhi, 1988.

E_RESOURCES

1. <https://ccsuniversity.ac.in/bridge-library/pdf/Research-Methodology-CR-Kothari.pdf>
2. https://repository.dinus.ac.id/docs/ajar/ethics_in_information_technology2c_5th_ed._0_3_.pdf

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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

Semester: III-SEC - NODE JS

Ins. Hrs. /Week:2

Course Credit:2

Course Code: P25SEIT31

UNIT I – INTRODUCTION TO NODE.JS

(2 Hours)

Introduction to Server-Side JavaScript-Features and Architecture of Node.js-Installing Node.js and npm -Node.js Runtime Environment-Event-Driven Programming-Asynchronous Programming Concepts-Node.js Modules-File System Operations- Buffers- Streams and Events

UNIT II – NODE.JS CORE MODULES AND WEB SERVER

(2 Hours)

Working with Core Modules-HTTP Module-Creating Web Servers-URL and Query String Modules-File Upload Handling-Working with JSON Data-Event Loop and Callback Functions-Error Handling in Node.js-Package Management using npm

UNIT III – EXPRESS.JS FRAMEWORK

(2 Hours)

Introduction to Express.js-Routing in Express.js-Middleware Functions-Request and Response Handling Template Engines-RESTful API Development-CRUD Operations-Authentication and Authorization-Session and Cookie Management

UNIT IV – DATABASE CONNECTIVITY AND REAL-TIME APPLICATIONS

(2 Hours)

Database Integration with Node.js-Working with MongoDB-Mongoose ODM-MySQL Connectivity Data Validation Techniques-Real-Time Communication using Socket.IO-Chat Application Development-API Testing Tools-Deployment Basics

UNIT V – ADVANCED NODE.JS APPLICATIONS

(2 Hours)

Asynchronous Programming with Promises and Async/Await-Microservices Architecture-Node.js Security Best Practices-Performance Optimization-Logging and Debugging-Testing Frameworks Cloud Deployment of Node.js Applications-Introduction to DevOps with Node.js-Future Trends in Node.js Development.

Total Lecture Hours : 30

COURSE OUTCOME

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

1. Explain the architecture and programming concepts of Node.js
2. Develop server-side applications using Node.js and Express.js Implement RESTful APIs and database connectivity in Node.js applications
3. Analyze asynchronous operations and real-time communication techniques.
4. Design scalable and secure web applications using Node.js technologies.

TEXT BOOKS

1. Alex Young and Marc Harter, Node.js in Action, 2nd Edition, Manning Publications, 2017.
2. Ethan Brown, Web Development with Node and Express, 2nd Edition, O'Reilly Media, 2019.
3. Shelley Powers, Learning Node, 2nd Edition, O'Reilly Media, 2016.

REFERENCE BOOK(S)

1. David Herron, Node.js Web Development, 5th Edition, Packt Publishing, 2020.
2. Sandro Pasquali, Mastering Node.js, Packt Publishing, 2017.
3. Brad Dayley, Node.js, MongoDB and Angular Web Development, Addison-Wesley Professional, 2018.
4. Azat Mardan, Practical Node.js, Apress, 2018.
5. Mike Cantelon, Marc Harter, T. J. Holowaychuk and Nathan Rajlich, Node.js in Practice, Manning Publications, 2015.

E-RESOURCES

1. [Node.js Official Documentation](#)
2. [Express.js Official Documentation](#)
3. [MongoDB Documentation](#)
4. [NodeSchool Interactive Tutorials](#)
5. [freeCodeCamp – Node.js Tutorials](#)

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	2
CO2	3	2	3	2	3	2	3	2	3	3	2	3	2	3	2	3	3
CO3	3	3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	2
CO4	3	3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	2
CO5	3	2	3	2	3	2	3	2	3	3	2	3	2	3	2	3	3
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 2025 – 2026)

PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

M.Sc., INFORMATION TECHNOLOGY

Semester: III - VAC-II – GENERATIVE AI TOOLS

Ins. Hrs. /Week:

Course Credit: 2

Course Code:P25ITVA32

UNIT I INTRODUCTION TO GENERATIVE AI TOOLS

(3 Hours)

Introduction: Definition of Artificial Intelligence and Generative AI – Evolution of AI – Types of Generative AI Models – Applications of Generative AI – Advantages and Limitations of GenAI – Ethical Issues in Generative AI.

UNIT II TEXT GENERATION AND AI PRODUCTIVITY TOOLS

(3 Hours)

AI-based Text Generation – Content Writing – Blog and Article Generation – Resume and Email Generation – AI-assisted Documentation – AI for Academic and Business Communication – Prompt Design Techniques – Zero-shot and Few-shot Prompting – Chain-of-Thought Prompting – Prompt Optimization Techniques.

UNIT III IMAGE, AUDIO AND VIDEO GENERATION TOOLS

(3 Hours)

AI Image Generation Concepts – Text-to-Image Generation – AI Image Editing and Enhancement – AI Art and Graphic Design – AI Audio Generation – Speech Synthesis – Voice Cloning – AI Music Generation.

UNIT IV GENERATIVE AI FOR DEVELOPMENT

(3 Hours)

Applications of Generative AI in Education, Healthcare, Finance, Marketing, and Customer Support – AI-powered Chatbots and Virtual Assistants – AI-assisted Software Development – Code Completion and Optimization

UNIT V RESPONSIBLE AI, SECURITY AND FUTURE TRENDS

(3 Hours)

Responsible AI Concepts – AI Ethics and Bias – Privacy and Security Issues in Generative AI – Copyright and Intellectual Property Rights – AI Governance and Regulations – Deepfakes and Misinformation

Total Lecturer Hours :30

COURSE OUTCOME

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

1. Understand the fundamentals, concepts, and applications of Generative AI tools.
2. Apply prompt engineering techniques for effective AI-based content generation.
3. Utilize Generative AI tools for text, image, audio, and video creation.
4. Apply AI tools and platforms for productivity, software development, and business applications.
5. Analyze ethical, legal, privacy, and security issues related to Generative AI technologies.

TEXT BOOKS

1. Ari Jouy, "Generative AI For Beginners", Independently Published, 2023.
2. Artificial Intelligence A Modern Approach, Pearson Education, 2021.

REFERENCE BOOK(S)

1. Deep Learning, MIT Press, 2016.
2. Hands-On Generative AI, O'Reilly Media, 2024.

E-RESOURCES

1. <https://platform.openai.com/docs/>
2. <https://ai.google/education/>
3. <https://www.coursera.org/courses?query=generative%20ai>
4. <https://www.deeplearning.ai/>
5. <https://learn.microsoft.com/en-us/azure/ai-services/>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

[illegible]

S-Strong (3)

M-Medium (2)

L-Low (1)

SEMESTER IV



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PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

M.Sc., INFORMATION TECHNOLOGY

Semester: IV CC-VII J2EE TECHNOLOGIES

Ins. Hrs. /Week:5

Course Credit:5

Course Code: P25IT410

UNIT- I: CLIENT – SERVER ARCHITECTURE

(15 Hours)

Introduction – Distributive Systems – Real Time Transmission – Software objects – Web Services – The Tier – Client, Resources and Components – Accessing Services – J2EE Multi-Tier Architecture– J2EE Best Practices – Clients – Client Presentation – Client Input Validation- Client Control- Duplicate Client Request- Session Management- Client-side Session State – Server-side Session State.

UNIT -II: PRESENTATION SERVICES

(15 Hours)

Java and XML – Generating an XML Document – Parsing XML- Document Object model (DOM)- Simple API for XML (SAX)- Java Servlets – Java Servlets and Common Gateway Interface Programming-Benefits of Using a Java Servlet – A Simple Java Servlet- Anatomy of a Java servlet - Java Server Pages-JSP Installation – JSP Tags – Tomcat – Request String-User Sessions – Cookies –Session Objects.

UNIT-III: INTERACTION SERVICES

(15 Hours)

Enterprise Java Beans – EJB Container – EJB Classes – EJB Interfaces - Deployment Descriptors – Session Java Bean – Stateless Vs Stateful – Creating a Session Java Bean - Entity Java Bean – Message Driven Bean – The JAR File -Java Mail – Java Remote Method Invocation – Remote method Invocation Concept- Server Side – Client Side.

UNIT- IV: SECURITY SERVICES

(15 Hours)

Java Message Service – JMS Fundamentals – Components of a JMS Program – Messages – Message Selector – Sending Message to a Queue – Receiving Message from a Queue – Compiling and Running Queue Programs – Creating a Publisher – Creating a Subscriber – Security – J2EE Security Concepts–JVM Security – Security Management – Java API Security – Browser Security – Web Services Security-Web Services Security Classifications – Security Within a WebServices Tier- Programmatic Security.

UNIT- V: J2EE DATABASES

(15 Hours)

J2EE Database Concepts – Data – Database – JDBC Objects – Database Connection – The Connection– Timeout - JDBC and Embedded SQL – Tables – Inserting Data into Tables – Selecting Data from a Table – Updating Tables – Deleting Data from Table.

Total Lecture Hours: 75

COURSE OUTCOME

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

1. Develop own Web applications with various available resources
2. Understand different open-source frameworks
3. Evaluate Java Runtime Environment and Java Virtual Machine
4. Familiarize the concept of J2EE Architecture and Specifications
5. Effectively use J2EE Databases

TEXT BOOKS

1. James Holmes, “The Complete References Struts Second Edition”, Tata McGraw Hill Edition, India, 2007.
2. Jim Keogh, “The Complete Reference J2EE”, Tata McGraw – Hill Edition, India, 2002.

REFERENCE BOOK(S)

1. Jusin Couch, Daniel H. Steinberg, “J2EE Bible”, Wiley India (P) Ltd, New Delhi, 2002.
2. Paul Tremblett, “Instant Enterprise Java Y-Beans”, Tata McGraw Hill Publishing Company, New Delhi. 2001.
3. Rick Cattell, “J2ee Technology in Practice: Building Business Applications with the Java 2Platform”, Enterprise Edition (Enterprise), Addison-Wesley Professional, Bostan, USA, 2001.

E_RESOURCES

1. http://ptgmedia.pearsoncmg.com/imprint_downloads/informit/sun/032124575X.pdf
2. https://www.lnjpitchapra.in/wp-content/uploads/2020/03/file_5e817ee54956f.pdf
3. <https://people.engr.ncsu.edu/efg/517/f02/common/syllabus/lectures/lec21.pdf>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	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	2	3	3	3	3	3	3	3	2	2
CO2	3	2	3	2	2	3	3	3	2	2	2	3	2	3	3	2	3
CO3	3	3	2	3	3	3	3	2	3	2	2	2	2	3	3	3	2
CO4	3	2	3	2	3	2	3	3	2	2	2	3	3	3	2	3	3
CO5	3	3	2	3	3	3	2	2	3	3	3	2	3	2	2	2	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

SEMESTER: IV – CC -VIII - ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Ins. Hrs. /Week: 5

Course Credit:5

Course Code: P25IT411

UNIT-I: INTRODUCTION TO ARTIFICIAL INTELLIGENCE (15 Hours)

Various Definitions of AI-Foundation of AI-Strong and Weak AI-History of AI-**Current Trends in AI:** Game Playing-Logistic Planning-Robotics-Language understanding and Problem Solving- Human Vs Machine-Feature of Artificial Intelligence-**Intelligent Agents:** Agents and its Environment –Architecture of Agent- Role of an Agent Program-The weak and Strong Agent-The Environments-Types of Agents-Designing an Agent System.

UNIT- II: PROBLEM SOLVING METHODS (15 Hours)

Problem Solving Strategies: Searching for Solution-Search Strategies- Control Strategy-Repeated States-Searching with partial Information-**Heuristic Search Strategies:** Heuristic Search-Local Search Algorithms and Optimization Problems - **Constraint Satisfaction Problems:** Constraint Satisfaction Problem Concepts-Constraints in CSPs-Backtracking Search-Local Search for CSP- Graph Structured CSP-**Alpha-Beta Pruning:** Steps in Alpha-Beta Pruning-Alpha Cutoff-Beta Cutoff-Algorithm for Alpha-Beta Pruning-Examples of Alpha-Beta Pruning.

UNIT-III: KNOWLEDGE REPRESENTATION (15 Hours)

Knowledge Representation and Propositional Logic: Representation and Mappings-Approaches to Knowledge Representation-Propositional Logic-Semantics for Propositional Logic-Forward and Backward Chaining-Agent based on Propositional Logic – **First Order Predicate Logic:** First Order Logic-Quantifiers-Wumpus World represented using First Order Logic-Monotonic and Non- Monotonic Reasoning-Programming in AI using Prolog-Knowledge Representation and Ontological Engineering.

UNIT-IV: INTRODUCTION TO SOFTWARE AGENT (15 Hours)

Software Agent and Multi Agent Systems: Intelligent Agent-Intelligent Programming Languages- **Multiagent Systems and Agent's Communication:** Need for Multi-agent Systems-Characteristics of Multi-agent Systems-Working Together in Multi-agent System-Artificial Neural Networks.

UNIT- V: APPLICATIONS (15 Hours)

AI in Field of Natural Language Processing: Introduction to Natural Language Processing- Knowledge Level used in Natural Language Processing-NLP Techniques-Morphological Analysis- Advantages of NLP-Problems in NLP-NLP Systems and Research in NLP-Information Retrieval(IR)- Big Data and Information Retrieval-Speech Recognition. **Robotics:** Overview of Robotics-Robot Classification-Robot Characteristics-Use of Robots-Mapping for a Point Robot-Contact-Inertial-Infrared Sensors-Sonar-Radar-Laser Rangefinders-Biological Sensing-Horizontal

Decomposition- Middleware-Robotic Assistant for persons with Disability-Robotic as Therapist for Neurological Conditions-Exoskeleton Robots for Replacing Motor Functions.

Total Lecture Hours-75

COURSE OUTCOME

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

1. Understand the problems that are amenable to solution by AI methods.
2. Understand the appropriate AI methods to solve a given problem.
3. Learn about the Formalise given problem in the language/framework of different AI methods.
4. Implement basic AI algorithm
5. Understand the basic concepts of robotics.

TEXT BOOKS

1. Anamitra Deshmukh-Nimbalkar, " Artificial Intelligence", Technical Publications, FirstEdition, Jan 2020, Chennai, Tamil Nadu. 2020.
2. David L.Poole, Alan K.Mackworth, "Artificial Intelligence: Foundations of Computational Agents" , Cambridge University Press, Cambridge, England, 2010.
3. Elaine Rich and Kevin Knight," Artificial Intelligence", Second Edition, Tata McGraw Hill Publishers Company Pvt Ltd, New Delhi, India. 1991.

REFERENCE BOOK(S)

1. Ethem Alpaydin,"Introduction to Machine Learning"(Adaptive computation and Machine Learning Series),Second Edition, The MIT Press, Cambridge. 2009.
2. Stuart Russel and Peter Norvig, "AI – A Modern Approach", 2nd Edition, PearsonEducation, London, England. 2007.

E-RESOURCES

1. <https://bit.ly/3ehDIG4>
2. <https://bit.ly/3suPDWf>
3. <https://bit.ly/2Q6dlLv>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	2	3	2	3	3	2	3	2	3	2	3	3	3	3
CO2	2	3	2	3	2	3	2	2	3	2	3	2	3	2	3	3	2
CO3	3	2	3	2	3	3	3	3	2	3	2	3	3	3	2	2	3
CO4	2	3	2	3	2	3	2	2	3	2	3	2	3	2	3	3	2
CO5	3	2	3	2	3	2	3	3	2	3	2	3	2	3	2	2	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: IV – CP-IV J2EE TECHNOLOGIES LAB

Ins. Hrs. /Week: 6

Course Credit: 3

Course Code: P25IT412P

EXERCISES

1. To find the marks of the students using Remote Method Invocations.
2. To write a Servlet program to calculate the bonus of an employee
3. To write a Servlet program to implement Session Tracking.
4. To write a Servlet program to check authentication for user using Cookies.
5. To write a Servlet program and use JDBC in it.
6. To write a simple program for JSP.
7. To write a JSP program that works with JDBC.
8. To write a JSP Program with Bean Class.
9. To write a EJB Stateless Program to create bonus of an employee.

Total Lecture Hours : 90

COURSE OUTCOME

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

1. To master the whole process of designing, implementing, and deploying J2EE Applications.
2. To implement and access web service components using EJB in java EE Applications.
3. To understand the concept of Servlet.
4. To know about the concept of Core Java.
5. Understanding different open source formats

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	3	2	2	2	3	3	3	2	2	2	3	3	3	2	2
CO2	2	3	2	3	3	3	2	2	3	3	3	2	3	3	3	3	2
CO3	3	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3	3
CO4	2	3	2	3	3	3	2	2	2	3	3	3	2	2	2	3	3
CO5	3	2	3	2	2	3	3	3	3	2	2	3	2	2	2	2	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: IV-EC-VI(A) - VIRTUAL AND AUGMENTED REALITY

Ins.Hrs./Week:4

Course Credit:3

Course Code:P25ITE46A

UNIT- I: INTRODUCTION

(16 Hours)

The three I's of virtual reality-commercial VR technology and the five classic components of a VR system - Input Devices: (Trackers, Navigation, and Gesture Interfaces): Three-dimensional position trackers, navigation and manipulation-interfaces and gesture interfaces-Output Devices: Graphics displays- sound displays & haptic feedback.

UNIT-II: VR DEVELOPMENT PROCESS

(14 Hours)

Geometric modeling - kinematics modelling- Physical modeling - behavior modeling - model Management.

UNIT- III: CONTENT CREATION CONSIDERATIONS FOR VR

(16 Hours)

Methodology and terminology-user performance studies-VR health and safety issues- Usability of virtual reality system- cyber sickness -side effects of exposures to virtual reality environment

UNIT- IV: VR ON THE WEB & VR ON THE MOBILE

(14 Hours)

JS-pros and cons-building blocks (WebVR, WebGL, Three.js, device orientation events)- frameworks (A-frame, React VR)-Google VR for Android-Scripts, mobile device configuration, building to android-cameras and interaction-teleporting-spatial audio-Assessing human parameters-device development and drivers-Design Haptics

UNIT- V: APPLICATIONS

(15 Hours)

Medical applications-military applications-robotics applications- Advanced Real time Tracking- other applications- games, movies, simulations, Therapy. CURRENT CONTOURS (For continuous internal assessment only): Contemporary Developments Related to the Course during the Semester Concerned.

Total Lecture Hours: 60

COURSE OUTCOME

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

1. Understand the basics of VR and AR
2. Analyze & Design a system or process to meet given specifications with realistic engineering constraints.
3. Identify problem statements and function as a member of an engineering design team.
4. Utilize technical resources
5. Propose technical documents and give technical oral presentations related to design mini project results.

TEXT BOOKS

1. C. Burdea & Philippe Coiffet, "Virtual Reality Technology", Second Edition, Gregory, John Wiley & Sons, Inc., 2008.
2. Jason Jerald. 2015. The VR Book: Human-Centred Design for Virtual Reality. Association for Computing Machinery and Morgan & Claypool, New York, NY, USA.

REFERENCE BOOK(S)

1. Dieter Schmalstieg & Tobias Hollerer, Augmented Reality: Principles and Practice (Usability), Pearson Education (US), Addison-Wesley Educational Publishers Inc, New Jersey, United States, 2016. ISBN: 9780321883575
2. Robert Scoble & Shel Israel, The Fourth Transformation: How Augmented Reality & Artificial Intelligence Will Change Everything, Patrick Brewster Press; 1 edition, 2016.
3. Steve Aukstakalnis, Addison-Wesley Practical Augmented Reality: A Guide to the Technologies, Applications, and Human Factors for AR and VR (Usability), Professional; 1 edition, 2016.
4. Tony Parisi, Learning Virtual Reality: Developing Immersive Experiences and Applications for Desktop, Web, and Mobile, O'Reilly Media; 1 edition, 2015.
5. Tony Parisi, Programming 3D Applications with HTML5 and WebGL: 3D Animation and Visualization for Web Pages, O'Reilly Media; 1 edition, 2014.

E-REFERENCES

1. <http://VR Development Pathway - Unity Learn>
2. [http://\(PDF\) Past, present and future of Virtual Reality: Analysis of its technological variables and definitions \(researchgate.net\)](http://(PDF) Past, present and future of Virtual Reality: Analysis of its technological variables and definitions (researchgate.net))

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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

Semester: IV-EC-VI (B)- TRENDS IN COMPUTING

Ins. Hrs. /Week: 4

Course Credit: 3

Course Code: P25ITE46B

UNIT-I: CLOUD COMPUTING

(12 Hours)

Basics: Overview – Applications – Intranets and the Cloud – First Movers in the Cloud – Organization and Cloud Computing: Benefits – Limitations – Security Concerns- The Business Case for Going to the Cloud: Cloud Computing Services -Deleting Datacentre.

UNIT- II: HARDWARE AND INFRASTRUCTURE

(12 Hours)

Clients – Security – Network –Services- Accessing the Cloud: Platforms - Cloud Storage: Overview – Cloud Storage Providers

UNIT III: Developing Applications

(12 Hours)

Google – Microsoft - Local Cloud and Thin Clients: Virtualization – Server Solutions – Thin Clients – Migrating to the Cloud

UNIT-IV: GRID COMPUTING

(12 Hours)

Introduction - Benefits – Grid Terms and Concepts: Types of Resources – Jobs and Applications –Scheduling, Reservation and Scavenging – Grid Software Components – Grid user role: User Perspective – Administrator Perspective - Design: Building grid architecture - Models – Topologies – Phases and Activities.

UNIT-V: GREEN COMPUTING

(12 Hours)

Introduction - History of Green Computing - Regulations and Industry Initiative - The Demons behind Green Computing - Approaches to Green Computing - Role of IT vendors - Green Computing Tips - Future is Green.

Total Lecture Hours-60

COURSE OUTCOME

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

1. Outline the history, applications, benefits and limitations of Cloud, Grid and Green computing
2. Describe the cloud infrastructure services, virtualization and determine how applications can be developed using cloud services
3. Identify cloud storage providers, software components of grid, technologies applied in building a green system and various key sustainability in Green IT Trends
4. Analyse the migrations and security concerns of cloud, different grid models, resources and also identify how the distributed computing environments can be built from lower level services
5. Assess the business cases of cloud, and also various laws, approaches and protocols .

TEXT BOOKS

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, "Cloud Computing - A practical Approach" , McGraw Hill, 2010.
2. Bart Jacob, Michael Brown, Kentaro Fukui, and NiharTrivedi, "Introduction to Grid Computing" ,IBM Redbook, 2005.

REFERENCE BOOK(S)

1. Bud E. Smith , " Green Computing: Tools and Techniques for Saving Energy, Money, and Resources", Auerbach Publications , 2013.
2. George Reese, "Cloud Application Architectures: Building Applications and Infrastructures in the cloud", O'Reilly Media Inc., 2009.
3. Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, "Cloud Computing for Dummies ", Wiley India Pvt Ltd ,2009.
4. J. Veleto, Anthony T. Veleto, Robert Elsenpeter, "Green IT – Reduce Your Information System"s Environmental Impact While Adding to the Bottom Line", McGraw-Hill ,2008.

E-RESOURCES

1. http://www.siteground.com/tutorials/cloud/cloud_computing_infrastructure.htm
2. <http://thecloudtutorial.com/>
3. <http://studymafia.org/wp-content/uploads/2015/11/CSE-Green-Computing-Report.pdf>
4. http://www.znu.ac.ir/data/members/dastjerdi_mohammad/Book11.pdf (Unit IV)
5. <http://www.cs.kent.edu/~farrell/grid06/lectures/grid01.pdf> (Unit V)

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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

Semester: IV-EC-VI(C)- ROBOTICS PROCESS AUTOMATION FOR BUSINESS

Ins. Hrs. /Week: 4

Course Credit: 3

Course Code: P25ITE46C

UNIT- I: INTRODUCTION

(12 Hours)

Introduction-Definition of Automation-Mechanization Vs Automation-Advantages-Goals-Social Issues-Types-Current Emphasis in Automation-Issues in automation in Factory Operations- Strategies of Automation

UNIT-II: INTRODUCTION ROBOTICS

(12 Hours)

History of Robots- Definition- Laws of Robotics-Characteristics-Components-Comparison of the Human and the Robot Manipulator-Robot Wrist and End of Arm Tools-Robot Terminology-Robotic Joints-Classification-Selection-Workcell-Robotics and Machine Vision-Applications

UNIT- III: ROBOT COMPONENTS

(12 Hours)

Robot Components: Sensors- Exteroceptors Sensors -Tactile Sensors -Proximity Sensors-Range Sensors-Machine Vision Sensors-Velocity Sensors-Proprioceptors-Robots with sensors- **End Effectors:** Grippers-selection of grippers-Gripping mechanism- tools-Types of Grippers- **Drives:** Pneumatic, Hydraulic, Electric Actuators

UNIT-IV: TRANSFORMATIONS

(12 Hours)

Transformations: Introduction to Manipulator Kinematics -Homogeneous Transformations-Robot Kinematics-Manipulator Path Control-Robot Dynamics- **Robot Programming Techniques:** Online programming- Lead-through Programming-Offline Programming-Task Level Programming-Motion Programming-Robot Programming Languages-Robot languages and its types

UNIT-V: APPLICATIONS OF ROBOTS

(12 Hours)

Applications of Robots: Robot Capabilities-Application of Robots-Manufacturing Applications- Material handling applications **Robotics and Artificial Intelligence:** Vision-Voice communication- Planning-Modelling-Adaptive control-Error monitoring and recovery-Autonomy and intelligence in robots-Expert systems in robotics

Total Lecture Hours : 60

COURSE OUTCOME

On the successful completion of the course, students will be able to, Outline the anatomy, specifications and applicability of Robotic system

1. Demonstrate the role of kinematics and dynamic behavior of robots with programming techniques
2. Identify the characteristics and functionality of robots in various sectors.
3. Analyze the various functionality of robotic systems with respect to software and hardware components
4. Assess the scientific background of robotic systems through various real time examples
5. Understanding the applications of robotics.

TEXT BOOKS

1. D.J.Todd, "Fundamentals of Robot Technology", An Introduction to Industrial Robots, Teleoperators and Robot Vehicles, Wiley,1986.
2. Gupta.A.K, Arora. S. K., Industrial Automation and Robotics, Mercury Learning and Information, 2017
3. Mikell P Groover, "Industrial Robotics", Mc GrawHill, 2012.

REFERENCE BOOK(S)

1. Ghoyal.K., Deepak Bhandari, "Automation and Robotics", S.K.Kataria& Sons Publishers, 2012.
2. Gonzalez, Fu Lee, Robotics: Control, Sensing, Vision and Intelligence, Wiley, 1998
3. John.J. Craig, "Introduction to Robotics: Mechanics and Control", Pearson, 2018.
4. Thomas. K. Rufuss, "Robotics and Automation Handbook", CRC Press, 2018

E-RESOURCES

1. <https://builtin.com/robotics>
2. <https://www.elprocus.com/robot-sensor/>
3. <https://sp-automation.co.uk/the-top-seven-types-of-robots/>
4. <https://robots.ieee.org/learn/types-of-robots/>
5. <https://www.intel.in/content/www/in/en/robotics/types-and-applications>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	PS01	PS02	PS03	PS04	PS05	PS06	PS07
CO1	3	3	3	3	3	3	3	2	2	3	3	3	3	3	2	2	3
CO2	3	2	2	3	2	2	3	3	3	2	2	2	2	3	3	3	2
CO3	2	3	3	2	3	3	3	3	2	3	2	3	3	3	3	2	3
CO4	3	2	3	3	2	3	2	3	3	2	2	2	3	2	3	3	2
CO5	2	3	3	2	3	3	3	2	2	3	3	3	3	3	2	2	3
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 2025 – 2026)

PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

M.Sc., INFORMATION TECHNOLOGY

**Semester: IV– Professional Competency Course - COMPUTER SCIENCE FOR
NET/SET**

Ins. Hrs. /Week: 2

Course Credit:2

Course Code: P25PCIT41

**UNIT - I : DISCRETE STRUCTURES , OPTIMIZATION AND COMPUTER
SYSTEM ARCHITECTURE**

(6 Hours)

Discrete Structures and Optimization: Mathematical Logic -Sets and Relations - Counting, Mathematical Induction and Discrete Probability - Group Theory - Graph Theory - Boolean Algebra – Optimization - **Computer System Architecture** : Digital Logic Circuits and Components - Data Representation - Register Transfer and Microoperations - Basic Computer Organization and Design - Programming the Basic Computer - Microprogrammed Control - Central Processing Unit - Pipeline and Vector Processing - Input-Output Organization - Memory Hierarchy – Multiprocessors.

**UNIT – II: PROGRAMMING LANGUAGES,COMPUTER GRAPHIC, DATABASE
MANAGEMENT SYSTEMS**

(6 Hours)

Programming Languages: Language Design and Translation Issues - Elementary Data Types - Programming in C - Object Oriented Programming - Programming in C++ - Web Programming - **Computer Graphics:** 2- D Geometrical Transforms and Viewing - 3-D Object Representation, Geometric Transformations and Viewing - **Database Management Systems:** Database System Concepts and Architecture - Data Modeling – SQL - Normalization for Relational Databases - Enhanced Data Models - Data Warehousing and Data Mining - Big Data Systems.

**UNIT- III: SYSTEM SOFTWARE AND OPERATING SYSTEM AND SOFTWARE
ENGINEERING**

(6 Hours)

System Software and Operating Systems: System Software - Basics of Operating System - Process Management – Threads - CPU Scheduling – Deadlocks - Memory Management - Storage Management - File and Input/Output Systems – Security - Virtual Machines – Linux operating Systems - Windows Operating Systems - Distributed Systems. **Software Engineering:** Software Process Models - Software Requirements - Software Design - Software Quality - Estimation and Scheduling of Software Projects - Software Testing - Software Configuration Management.

**UNIT- IV: DATA STRUCTURES AND ALGORITHMS AND THEORY OF COMPUTATION
AND COMPILERS**

(6 Hours)

Data Structures and Algorithms: Data Structures - Performance Analysis of Algorithms and Recurrences - Design Techniques - Lower Bound theory - Graph Algorithms - Complexity Theory - Advanced Algorithms. **Theory of Computation – Compilers:** Regular Language Models - Context Free Language - Turing Machines(TM) - Unsolvability Problems and Computational Complexity - Syntax Analysis - Semantic Analysis

- Run Time System - Intermediate Code Generation - Code Generation and Code Optimization.

UNIT- V: DATA COMMUNICATION AND COMPUTER NETWORKS AND AI (6 Hours)

Data Communication and Computer Networks: Network Models - Functions of OSI and TCP/IP Layers - World Wide Web (WWW) - Network Security - Mobile Technology - Cloud Computing and IoT - **Artificial Intelligence (AI):** Approaches to AI - Knowledge Representation – Planning - Natural Language Processing - Multi Agent Systems - Fuzzy Sets - Genetic Algorithms (GA) - Artificial Neural Networks (ANN).

Total Lecture Hours -30

COURSE OUTCOME

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

1. Demonstrate the concepts of Discrete Structures and Optimization and Computer System Architecture
2. Analyze the applications of Programming Languages, Computer Graphics and Database Management Systems
3. Analyze the concepts of System Software, Operating System and Software Engineering
4. Understand the features of Data Structures and Algorithm, Theory of Computation and Compilers
5. Understand the Data Communication and Computer Networks and Artificial Intelligence (AI)

TEXT BOOK

1. R.Gupta, "NTA-UGC-NET/JRF: Computer Sciences & Applications (Paper I & Paper II) Previous Years Papers (Solved)", 2024, RPH Editorial Board

REFERENCE BOOK(S)

1. Behrouz A.Forouzan, "Data Communications and Networking", 5th Edition, McGraw Hill Education.
2. Donald D.Hearn, M.Pauline Baker, "Computer Graphics C Version", 2nd Edition, Pearson Education India.
3. Douglas B.West, "Introduction to Graph Theory", 2nd Edition, Pearson Education India.
4. Dhananjay Dhamdhare, "System Programming", 1st Edition, McGraw Hill Education.
5. Ellis Horowitz, Sartaj Sahni, Susan Anderson Freed, "Fundamentals of Data Structures in C", 2nd Edition, Universities Press.
6. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, "Introduction to Automata Theory, Languages, and Computation", 3rd Edition, Pearson Education.
7. Kenneth H. Rosen, "Discrete Mathematics and its Applications", 7th Edition, McGraw Hill Education (India) Private Limited.
8. M. Ganesh, "Introduction to Fuzzy Sets and Fuzzy Logic", Prentice Hall India Learning Private Limited.
9. Morris Mano, "Computer System Architecture", Third edition, 2019
10. Peter Norvig, Stuart J. Russell, "Artificial Intelligence A Modern Approach", 3rd Edition, Pearson Education India
11. Pressman, "Software Engineering: A Practitioner's Approach", 8th Edition, McGraw Hill Education.
12. Stuart E. Madnick, John J. Donovan, "Operating Systems", McGraw-Hill, 1978

E-RESOURCES

1. <https://www.mbit.edu.in/wp-content/uploads/2020/05/computer-systems-Architecture.pdf>
2. <https://www.maths.ed.ac.uk/~v1ranick/papers/wilsongraph.pdf>
3. <https://www.ddegjust.ac.in/2021/bca/Operating%20System.pdf>

COURSE LEARNING OUTCOME (FOR MAPPING WITH POS AND PSOS)

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