MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous College)

Affiliated to Periyar University, Salem | Accredited by **NAAC** with '**A**' Grade

Recognized by **UGC** under Section 2(f) & 12 (B)

ESTD-1994

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

A UNIT OF VANETRA GROUP

Learn. Lead

DEGREE OF BACHELOR OF SCIENCE

Learning Outcomes – Based Curriculum Framework

– Choice Based Credit System

Syllabus for

B.Sc., Computer Science – Artificial Intelligence and Machine Learning

(Semester Pattern)

(For Candidates admitted from the academic year 2024–2025 and onwards)

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
RASIPURAM - 637408.

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Regulation and Syllabus for B.Sc-CS AI and ML

(With effect from the Academic Year 2024-25)

Vision:

To redefine the scope of higher education by infusing into each of our pursuits, initiatives that will encourage intellectual, emotional, social and spiritual growth, there by nurturing a generation of committed, Knowledgeable and socially responsible citizens.

Mission:

*To Ensure State of the world learning experience

*To espouse value based Education

*To empower rural education

*To instill the sprite of entrepreneurship and enterprise

*To create are source pool of socially responsible world citizens

QUALITY POLICY

To Seek–To Strive–To Achieve greater heights in Arts and Science, Engineering, Technological and Management Education without compromising on the Quality of Education.

Vision:

DEPARTMENT OF COMPUTER APPLICATION

* To attain global recognition in the computer science and applications, research

And training to meet the growing needs of an Industry and Society.

Mission:

* To impart quality education

* To develop Industry-Academia relationship

* To provide State-of-art research facility

* To train various technologies in the thrust areas of computer science and applications.

PREAMBLE

The course is designed to bridge the gap between IT industries and academic institutes by incorporating the latest Artificial Intelligence technologies into the curriculum and to give students a complete understanding within a structured framework. The curriculum supports students to gain adequate knowledge in advanced programming as well as Artificial Intelligence practices along with theoretical foundation and also includes interdisciplinary courses and electives for widening the domain expertise. State-of-the-art infrastructure provides an excellent learning environment to hone the knowledge of each student.

PROGRAMME LEARNING OUTCOME

i) To design, implement, and evaluate computer-based system, process, component, or program to meet desired needs by critical understanding, analysis and synthesis.

ii) Identify applications of Computer Science in other fields in the real world to enhance the career prospects.

iii) Realize the requirement of lifelong learning through continued education and research.

iv) Use the concepts of best practices and standards to develop user interactive and abstract application.

v) Understand the professional, ethical, legal, security, social issues and responsibilities.

NATURE AND EXTENT OF THE PROGRAMME

The undergraduate programme in B.Sc-CS AI and ML is the first level of college or university degree in the country as in several other parts of the world. After obtaining this degree, a Computer technician may enter into the job market or opt for undertaking further higher studies in the subject. After graduation the students may join IT industry, BPO Sector, Robotic sector and play their role as Software Engineer in a useful manner contributing their knowledge to the welfare of the society. Thus the undergraduate level degree in B.Sc-CS AI and ML must prepare the

students for all these objectives. The LOCF curriculum has been developed encompassing all the diversified aspects of Computer Application with reasonable depth of knowledge and skills as to specialize them in the various aspects of the subject. It also equips them with the expected professional expertise.

AIM OF THE PROGRAMME

The course provides the strong foundations in fundamentals of computer science with the knowledge of AI and Virtual Reality for employability and/or further studies in Post-graduation. Empower students with competencies in creative thinking, working in virtual domain with AI technique problem solving in virtual domain, inter-personal communication and managerial skills. Facilitate overall understanding of the technological development with legal and ethical issues. Equip the students in providing professional solutions to next generation solutions using AI techniques and adopting Virtual Reality concepts

GRADUATE ATTRIBUTES

Bachelor of Computer Science-Artificial Intelligence and Machine Learning (B.Sc-CS AI and ML) encompass a comprehensive skill set tailored to meet the demands of the digital age. B.Sc-CS AI and ML) graduates are equipped with foundational knowledge in computer science, including programming languages such as C++, Java, R Programming, and Python. They possess a strong understanding of data structures, algorithms, and software development methodologies, enabling them to design and develop efficient and scalable applications. Proficiency in database management systems (DBMS) and web technologies equips them to handle data effectively and develop dynamic web applications. Ethical considerations are integral to their education, with an understanding of professional ethics in software development and data management. They are prepared to navigate ethical challenges in technology, ensuring responsible use of information and adherence to legal standards. Furthermore, B.Sc-CS AI and ML programme emphasize continuous learning and adaptation to evolving technologies, instilling a mindset of lifelong learning. Graduates are poised to contribute effectively to the IT industry, equipped with the skills and attributes needed to thrive in various roles such as software developers, system analysts, and technology consultants.

GA 1 Analytical Reasoning

GA 2 Critical Thinking

GA 3 Problem Solving Skills

GA 4 Communication Skills

GA 5 Leadership Quality

GA 6 Team work

GA 7 Lifelong Learning

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1: Graduates will be able to promote learning environment to meet the industry expectation

PEO2: Graduates will be incorporated the critical thinking with Good Communication and Leadership skills to become a self-employed

PEO3: Graduates will be uphold the human values and environmental sustenance for the betterment of the society.

PROGRAMME OUTCOMES (POs)

PO1: Graduates will acquire dynamic skills through proper perception of the course Objectives that leads to scientific and analytical comprehension of the concepts.

PO2: Graduateswillfocusonsustainablegoalsthatmightbringaboutspherical developments

PO3: Graduates will infuse a spirit converging on bricking a team work, interpersonal and administrative skills to think criticallyand execute effectively

PO4: Graduates will apply reasoning appropriately to scale the humps in learning And solute them to the core.

PO5: Graduates will engage the skills obtained in independent and collaborative Learning as a perennial process.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1:	Demonstrate the knowledge of human cognition, Artificial Intelligence, Machine Learning and data engineering for designing intelligent systems.
PSO-2:	Apply computational knowledge and project development skills to provide innovative solutions.
PSO-3:	To Execute the career in corporate sectors.
PSO-4:	Use tools and techniques to solve problems in AI and ML.
PSO-5:	To organize a concrete foundation and enrich the abilities to qualify for Employment, Higher Studies and Research in Computer Application and Data science with ethical values.

REGULATIONS

DURATION OF THE PROGRAME

1.1. Three years(six semesters)

1.2. Each academic year shall be divided into two semesters. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to May of each year.

1.3. There shall be not less than 90 working days for each semester.

2. ELIGIBILITY FOR ADMISSION

2.1. A candidate who has passed in Higher Secondary Examination with Mathematics or Information Technology or computer Technology or Business Mathematics or Computer Science or Statistics or Computer Applications (Academic stream or Vocational stream) as one of the subject under Higher Secondary Board of Examination, Tamilnadu as per norms set by the Government of Tamilnadu.

3. CREDIT REQUIRMENTS AND ELIGIBILITY FORAWARD OF DEGREE

3.1. A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years and passed the examinations of all the Six Semesters prescribed earning a minimum of 140 credits as per the distribution given in Regulation for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

4. COURSE OF STUDY,CREDITS AND SCHEME OF EXAMINATION

4.1. The Course Components and Credit Distribution shall consist of the following:(Minimum Number of Credits to be obtained)

Part Wise Distribution	Study Components	Credit Distribution
PART I	Tamil or Other Languages	**12**
PARTII	English	**12**
PARTIII	Core, Allied, Elective and Project Courses	**91**
PART IV	i. Basic Tamil/Advanced Tamil/NME	**04**
	ii. Soft Skill Courses/SBEC	**10**
	iii. Environmental Studies	**02**
	iv. Value Education	**02**
	v. Internship	**02**
	vi. Foundation Course	**02**
	vii. Professional Competency Skills	**02**
PART V	Extension Activity	**01**
Total Credits		140

4.2 DETAILS OF COURSE OF STUDY OF PARTS I–V

4.2.1 PART I: Tamil and Other Languages Hindi or French at the option of candidates and according to the syllabus and text-books prescribed from time to time.

4.2.2 PART II: English: According to the syllabus and text-books prescribed from time to time.

4.2.3 PART III: Core, Allied Project and Elective Courses: As prescribed by the concerned Board of Studies

4.2.4 PART IV:

i. Basic Tamil/Advanced Tamil/NME:

a. Students who have not studied Tamil up to XII STD and have taken any Language other than Tamil in Part I shall take Basic Tamil comprising of Two Courses (level will be at 6thStandard).

b. Students who have studied Tamil up to XII STD and have taken any Language other than Tamil in Part – I shall take Advanced Tamil comprising of Two Courses.

c. Students who have studied Tamil up to XII STD and also have taken Tamil in Part–I shall take Non-Major Elective comprising of Two Courses.

i. Soft Skill Courses/SBEC

ii. Environmental Studies

iii. Value Education

iv. Internship

v. Foundation Course

vi. Professional Competency Skills(Online)

4.2.5 PART V: Extension Activity:

Students shall be awarded a maximum of 1 Credit for Compulsory Extension Service. All the Students shall have to enroll for NSS /NCC/ NSO (Sports & Games) Retract / Youth Red Cross or any other Service Organizations in the College and shall have to put in compulsory minimum attendance of 40 hours which shall be duly certified by the

Principal of the College before 31st March in a year. If a student lacks 40 hours attendance in the first year, he or she shall have to compensate the same during the subsequent years.

Those students who complete minimum attendance of 40 hours in one year will get 'half-a- credit and those who complete the attendance of 80 or more hours in Two Years will get 'one credit'. Literacy and Population Education and Field Work shall be compulsory components in the above extension service activities.

4.3. Inclusion of the Massive Open Online Courses (MOOCs) available on SWAYAM and NPTEL

4.3.1 Students can choose the MOOC Course Available on SWAYAM and NPTEL under Core, Elective or Soft skill category. He/ she will be awarded degree only after producing valid certificate of the MOOC course for credit Mobility.

5. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

5.1 Eligibility: Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed by the Periyar University.

5.2. Attendance: All Students must earn 75% and above of attendance for appearing for the End Semester Examination (Theory/Practical).

5.3. Condonation of shortage of attendance: If a Student fails to earn the minimum attendance (Percentage stipulated), the Principals shall con done the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than75%) after collecting the prescribed fee for Theory/Practical examination separately, towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.

5.4. Non-eligibility for condonation of shortage of attendance: Students who have secured less than 65% but more than 50% of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program and they may be permitted to take next University examination by paying the prescribed condonation fee.

5.5. Detained students for want of attendance: Students who have earned less than 50% of attendance shall not be permitted to proceed to the next semester and to complete

the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the College from time to time.

5.6. Condonation of shortage of attendance for married women students: In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor (D.G.O) from the Government Hospital and the prescribed fee along with attendance details shall be forwarded to the college to consider the condonation of attendance mentioning the category.

5.7. Zero Percent (0%) Attendance: The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the College/University immediately to rejoin the program.

5.8 Transfer of Students and Credits: The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities by obtaining necessary permission from the university.

5.8.1 Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature.

Provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested.

Provided the Student should have passed all the courses in the Institution from where the transfer is requested.

5.8.2 The marks obtained in the courses will be converted and grades will be assigned as per the College norms.

5.8.3 The transfer students are eligible for classification.

5.8.4 The transfer students are not eligible for Ranking, Prizes and Medals.

5.8.5 Students who want to go to foreign Universities up to two semesters or Project Work with the prior approval of the Departmental/College Committee are allowed to get

transfer of credits and marks which will be converted in to Grades as per the University norms and are eligible to get CGPA and Classification; they are not eligible for Ranking, Prizes and Medals.

5.9 Students are exempted from attendance requirements for online courses of the College and MOOC's.

6. EXAMINATION AND EVALUATION

6.1. Register for all subjects: Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

6.2. Marks for Internal and End Semester Examinations for PART I, II, III, and IV

Category	Theory	Practical
Internal Assessment	**25**	**40**
End semester Examination	**75**	**60**

6.3. Procedure for Awarding Internal Marks Internal Examination Marks–Theory

Components	Marks
CIAI&II	**15**
Attendance	**5**
Assignment/Quiz	**5**
Total	**25**

6.4 Awarding Marks for Attendance(out of 5)

Percentage of Attendance	Marks
Below 60%	0marks
60% to 75%	3marks
75% to 90%	4marks
Above 90%	5marks

6.5 Components for Practical CIA.

Components	Marks
CIA - I	15
CIA- II	15
Observation Note	05
Attendance	5
Total	40

6.6 Components for Practical ESE.

Components	Marks
Completion of Experiments	50
Record	05
Viva Voce	05
Total	60

6.7 Guidelines for Value Education Yoga and Environmental Studies(Part IV)

6.7.1. The Course Value Education Yoga is to be treated as 100% CIA course which is offered in V Semester for I year UG students.

6.7.2. The Course Environmental Studies is to be treated as 100% CIA course which is offered in IV Semester for I year UG students.

6.7.3 Total Marks for the Course =100

Components	Marks
Two Tests(2x30)	**60**
Field visit and report (10+10)	**20**
Two Assignments(2x10)	**20**
Total	**100**

The passing minimum for this course is 40%

6.7.4 In case, the candidate fails to secure 40% passing minimum, he/she may have to reappear for the same in the subsequent odd/even semesters.

6.8 Internship/Industrial Training, Mini Project and Major Project Work

Internship/ Industrial Training		Mini Project	Major	Project Work	
Components	**Marks**	**Marks**	**Components**		Marks
CIA*2			**CIA**		**40**
Work Diary	25	-	a) Attendance	10Marks	
Report	50	50			
Viva–voce	25	50	**b)** Review /Work Diary***1**	30Marks	
Examination					
Total	**100**	**100**	**ESE***2		
			a) Final Report - 40Marksb)Viva – voce - 20Marks		**60**
			Total		
					100

*1. Review is for Individual Project and Work Diary is for Group Projects (Group consisting of minimum 3 and maximum 5)

*2. Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

6.9 Guide lines for Professional Competency Skill-Online Mode(Part IV)- Online Exam 3 hours

Components	Marks
100 Objective Type Questions **100*1=100 Marks**	**100**

Objective type Questions from Question Bank.

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he/she may have to reappear for the same in the subsequent semesters.

QUESTION PAPER PATTERN FOR CIA I, II AND ESE	
(3 HOURS)	**MAXIMUM:75 Marks**
SECTION-A **(Objective Type)** **Answer ALL Questions** ALL Questions Carry EQUAL Marks (10x1=10 marks)	
SECTION-B **(Either or Type)** **Answer ALL Questions** ALL Questions Carry EQUAL Marks (5x5=25 marks)	
SECTION-C **(Either or Type)** **Answer ALL Questions** ALL Questions Carry EQUAL Marks (5x8=40 marks)	
(Syllabus for CIA - I 2.5 Units, Syllabus for CIA – II All 5 Units)	

6.10. PASSING MINIMUM

6.10.1. There shall be no passing minimum for Internal.

6.10.2. For external examination, passing minimum shall be 40% [Forty Percentage] of the maximum marks prescribed for the course for each Course/ Practical/ Project and Viva-Voce.

6.10.3. In the aggregate[External/Internal] the passing minimum shall be of40%.

6.10.4. He /She shall be declared to have passed the whole examination, if He /she passes in all the Courses and Practical wherever prescribed as per the scheme of the examinations by earning 140 CREDITS in Part I, II, III, IV& V. He/she shall also fulfill the extension activities prescribed earning a minimum of 1 credit to qualify for the Degree.

6.11. SUPPLIMENTARY EXAMINATION:

Supplementary Examinations is conducted for the students who appeared in the final semester examinations. Eligible criteria for appearing in the Supplementary Examinations are as follows:

6.11.1. **Eligibility:** A Student who is having arrear of only one theory course in any of the semester or two theory course in the Final semester of the UG degree programme alone is eligible for Supplementary Examinations.

6.11.2. **Non-eligibility for those completed the program:** Students who have completed their Program duration but having arrears are not eligible to appear for Supplementary Examinations.

6.12. RETOTALLING, REVALUATION AND PHOTOCOPY OF THE ANSWER SCRIPTS:

6.12.1. **Re-totaling:** All UG Students who appeared for their Semester Examinations are eligible for applying for re-totaling of their answer scripts.

6.12.2. **Revaluation:** All current batch Students who have appeared for their Semester Examinations are eligible for Revaluation of their answer scripts. Passed out candidates are not eligible for Revaluation.

6.12.3. **Photo copy of the answer scripts:** Students who have applied for revaluation can apply for the Photocopy of answer scripts by paying prescribed fee.

7. CLASSIFICATION OF SUCCESSFUL STUDENTS

RANGE OF MARKS	GRADE POINTS	LETTER GRADE	DESCRIPTION
90-100	9.0 - 10.0	O	**Outstanding**
80-89	8.0 - 8.9	D+	**Excellent**
75-79	7.5 - 7.9	D	**Distinction**
70-74	7.0 - 7.4	A+	**Very Good**
60-69	6.0 - 6.9	A	**Good**
50-59	5.0 - 5.9	B	**Average**
40-49	4.0 - 4.9	C	**Satisfactory**
00-39	0.0	U	**Re-appear**
ABSENT	0.0	AAA	**ABSENT**

7.1.Computation of Grade Point Average (GPA) in a Semester, Cumulative Grade Point Average (CGPA) and Classification GPA for a Semester:=∑iCiGi,∑iCi

That is, GPA is the sum of the multiplication of grade points by the credits of the courses divided by the sum of the credits of the courses in a semester.

CGPA for the entire programme: = ∑n∑iCniGni ,∑n∑iCni That is, CGPA is the sum of the multiplication of grade points by the credits of the entire programme divided by the sum of the credits of the courses of the entire programme.

Where,

Ci = Credits earned for course I in any semester,

Gi = Grade Points obtained for course in any semester =Semester in which such courses were credited.

7.2 Letter Grade and Classification

CGPA	GRADE	CLASSIFICATION OFFINAL RESULT
9.5 - 10.0	O+	**First Class - Exemplary***
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	**First Class with Distinction***
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	**First Class**
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	**Second Class**
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	**Third Class**
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	**U**	**Re-appear**

- The Students who have passed in the first appearance and within the prescribed semester of the UG Programme (Major, Allied and Elective courses only) are eligible.

8. RANKING

Students who pass all the examinations prescribed for the Program in the FIRST APPEARANCE IT SELF ALONE are eligible for Ranking I, II and III.

9. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAM TO QUALIFY FOR A DEGREE

9.1. A Student who for whatever reasons is not able to complete the program within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree.(Time Span=N+2 years for the completion of programme).

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
Abstract under LOCF-CBCS Pattern with effect from 2024-2025 Onwards

Structure of Credit Distribution as per the TANSCHE / UGC Guidelines

S.No.	Study Components	Part	Sem I		Sem II		Sem III		Sem IV		Sem V		Sem VI		No.of Courses	Total Credit
			No.of Course	Credit	No.of Course	Credit	No.of	Credit	No.of Course	Credit	No.of Course	Credit	No.of	Credit		
1	LANGUAGE - I	I	1	3	1	3	1	3	1	3					4	12
2	LANGUAGE - II	II	1	3	1	3	1	3	1	3					4	12
3	DISCIPLINE SPECIFIC COURSE(DSC)-THEORY	III	1	5	1	5	1	5	1	5	2	10	2	10	7	40
4	DSC - PRACTICAL	III	1	3	1	3	1	3	1	3	1	3	1	3	7	18
5	GENERIC ELECTIVE COURSES(GEC)-THEORY	III	1	3	1	3	1	3	1	3					4	12
6	GEC PRACTICAL	III													0	0
7	DISCIPLINE SPECIFIC ELECTIVE COURSES(DSE)	III									2	8	2	8	4	16
8	PROJECT WORK	III											1	5	1	5
9	INTERNSHIP	IV									1	2			1	2
10	ONLINE - COMPETITIVE EXAMINATION	IV											1	2	1	2
11	SKILL ENHANCEMENT COURSES(SEC)-SBEC	IV	1	2											1	2
12	NON MAJOR ELECTIVE COURSES(NMEC)	IV			1	2	2	4	2	4					5	10
13	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC)-EVS	IV	1	2	1	2									2	4
14	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC)-VALUE EDUCATION - YOGA	IV							1	2					1	2
15	FOUNDATION COURSE	IV									1	2			1	2
16	EXTENSION ACTIVITY	V										0	1	1	1	1
	Cumulative Credits		**7**	**21**	**7**	**21**	**7**	**21**	**8**	**23**	**7**	**25**	**8**	**29**	**44**	**140**

Total No.of Subjects	44
Marks	4300

PART	No.of Credits
PART - I	12
PART - II	12
PART - III	91
PART - IV	24
PART - V	1
Grand Total	140

Extra Credit(2+2)	4
Grand Total	144

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(for the Students Admitted from the Academic Year:2024-2025 Onwards)

S.No.	PART	STUDY COMPONENTS	COURSE_CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
					Lect.	Lab.		CIA	ESE	TOTAL
SEMESTER - I										
1	I	LANGUAGE-I	23M1UFTA01	TAMIL - I	6	-	3	25	75	100
2	II	LANGUAGE-II	23M1UFEN01	ENGLISH - I	6	-	3	25	75	100
3	III	DSC THEORY - I	24M1UAMC01	OBJECT ORIENTED PROGRAMMING IN C++	5	-	5	25	75	100
4	III	GEC THEORY - I	23M1UMAA03	DISCRETE MATHEMATICS - I	4	-	3	25	75	100
5	III	DSC PRACTICAL - I	24M1UAMP01	PRACTICAL:PROGRAMMING IN C++	-	5	3	40	60	100
6	IV	NMEC - I			2	-	2	25	75	100
7	IV	FC - I	24M1UAMFC1	PROBLEM SOLVING TECHNIQUES	2	-	2	25	75	100
				TOTAL	**25**	**5**	**21**	**190**	**510**	**700**
SEMESTER - II										
1	I	LANGUAGE - I	23M2UFTA02	TAMIL - II	6	-	3	25	75	100
2	II	LANGUAGE - II	23M2UFEN02	ENGLISH - II	6	-	3	25	75	100
3	III	DSC THEORY - II	24M2UAMC02	PROGRAMMING IN JAVA	5	-	5	25	75	100
4	III	GEC THEORY - II	23M2UMAA08	NUMERICAL METHODS	4	-	3	25	75	100
5	III	DSC PRACTICAL - II	24M2UAMP02	PRACTICAL:PROGRAMMING IN JAVA	-	5	3	40	60	100
6	IV	NMEC - II			2	-	2	25	75	100
7	IV	SEC - I			2	-	2	25	75	100
				TOTAL	**25**	**5**	**21**	**190**	**510**	**700**

SEMESTER - III										
1	I	LANGUAGE-I	23M3UFTA03	TAMIL - III	6	-	3	25	75	100
2	II	LANGUAGE-II	23M3UFEN03	ENGLISH - III	6	-	3	25	75	100
3	III	DSC THEORY - III	24M3UAMC03	PROGRAMMING IN PYTHON	5	-	5	25	75	100
4	III	GEC THEORY - III	23M3USTA08	STATISTICAL METHODS AND ITS APPLICATIONS-I	5	-	3	25	75	100
5	III	DSC PRACTICAL - III	24M3UAMP03	PRACTICAL : PYTHON PROGRAMMING	-	4	3	40	60	100
6	IV	SEC - II			2	-	2	25	75	100
7	IV	SEC - III			2	-	2	25	75	100
				TOTAL	**26**	**4**	**21**	**190**	**510**	**700**
SEMESTER - IV										
1	I	LANGUAGE-I	23M4UFTA04	TAMIL - IV	6	-	3	25	75	100
2	II	LANGUAGE-II	23M4UFEN04	ENGLISH - IV	6	-	3	25	75	100
3	III	DSC THEORY - IV	24M4UAMC04	R PROGRAMMING	5	-	5	25	75	100
4	III	GEC THEORY - IV	24M4USTA09	STATISTICAL METHODS AND ITS APPLICATIONS-II	4	-	3	25	75	100
5	III	DSC PRACTICAL - IV	24M4UAMP04	PRACTICAL:R PROGRAMMING	-	5	3	40	60	100
6	IV	SEC - IV			2	-	2	25	75	100
7	IV	SEC - V			2	-	2	25	75	100
8	IV	AECC - ENVIRONMENTAL STUDIES*	23M4UEVS01	ENVIRONMENTAL STUDIES	-	-	2	100	-	100
		***Self Study**		**TOTAL**	**25**	**5**	**23**	**290**	**510**	**800**

SEMESTER - V										
1	III	DSC THEORY - V	24M5UAMC05	MACHINE LEARNING TECHNIQUES	6	-	5	25	75	100
2	III	DSC THEORY - VI	24M5UAMC06	DEEP LEARNING	6	-	5	25	75	100
3	III	DSE THEORY - I			5	-	4	25	75	100
4	III	DSE THEORY - II			5	-	4	25	75	100
5	III	DSC PRACTICAL - V	24M5UAMP05	PRACTICAL:MACHINE LEARNING LAB	-	6	3	40	60	100
6	IV	AECC - VALUE EDUCATION	23M5UVED01	YOGA	2	-	2	100	-	100
7	IV	INTERNSHIP	24M5UAMIS1	INTERNSHIP / INDUSTRIAL TRAINING	-	-	2	100	-	100
				TOTAL	**24**	**6**	**25**	**340**	**360**	**700**
SEMESTER - VI										
1	III	DSC THEORY - VII	24M6UAMC07	NATURAL LANGUAGE PROCESSING	5	-	5	25	75	100
2	III	DSC THEORY - VIII	24M6UAMC08	ARTIFICIAL INTELLIGENCE	5	-	5	40	60	100
3	III	DSE THEORY - III			5	-	4	25	75	100
4	III	DSE THEORY - IV			5	-	4	25	75	100
5	III	DSC PRACTICAL - VI	24M6UAMP06	PRACTICAL:NATURAL LANGUAGE PROCESSING LAB	-	5	3	40	60	100
6	IV	PROFESSIONAL COMPETENCY SKILL	24M6UAMOE1	ARTIFICIAL INTELLIGENCE FOR COMPETITIVE EXAMINATION		-	2	25	75	100
7	III	PROJECT WORK	24M6UAMPR1	PROJECT WORK	5	-	5	25	75	100
8	V	EXTENSION ACTIVITY		EXTENSION ACTIVITY	-	-	1	-	-	-
				TOTAL	**20**	**10**	**29**	**205**	**495**	**700**
				OVERALL TOTAL	**145**	**35**	**140**	**1405**	**2895**	**4300**
		EXTRA		VALUE ADDED COURSE	-	-	**2**	-	-	-
				EXTRA CREDIT SWAYAM/MOOC ONLINE	-	-	**2**	-	-	-

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UAMC01	**OBJECT ORIENTED PROGRAMMING IN C++**	**DSC THEORY - I**	**I**	**5**	**5**	**-**	**-**	**5**
Objective	Students can understand the concepts of OOPs concept, and impart the knowledge on demand.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to C++** - Key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. **Control Structures:** - Decision Making and Statements: If ... else, jump, goto, break, continue, Switch case statements - Loops in C++: for, while, do - functions in C++ - inline functions – Function Overloading.	K1	13
II	**Classes and Objects:** Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.	K2	12
III	**Operator Overloading:** Overloading unary, binary operators – Overloading Friend functions – type conversion – **Inheritance:** Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.	K3	11
IV	**Pointers** : Declaration – Pointer to Class, Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding, Polymorphism and Virtual Functions.	K4	12

V	**Files:** File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions. **Current Trends:** C++ Standard Template Library (STL)	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Recall the concepts of Object Oriented Programming.	K1	
	CO2: Summarize the basics of C++ language.	K2	
	CO3: Apply the concept of Operator overloading and inheritance.	K3	
	CO4: Examine pointers and virtual functions.	K4	
	CO5: Measure file concepts and templates	K5	

Learning Resources	
Text Books	1. Ashok N Kamthane, Object-Oriented Programming with Ansi and Turbo C++, Pearson Education, 2003.
Reference Books	1. E. Balagurusamy, Object-Oriented Programming with C++, TMH, 1998. 2. Maria Litvin & Gray Litvin, C++ for you, Vikas publication, 2002.
Website Link	1. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview 2. https://onlinecourses.swayam2.ac.in/arp19_ap79/preview
Self-Study Material	https://www.geeksforgeeks.org/the-c-standard-template-library-stl/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UAMC01	**OBJECT ORIENTED PROGRAMMING IN C++**	**DSC THEORY - I**	**I**	**5**	**5**	**-**	**-**	**5**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs.N.Hyrunnisha	**HoD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UAMP01	**PROGRAMMING IN C++**	**DSC PRACTICAL - I**	**I**	**5**	**-**	**-**	**5**	**3**
Objective	Student can understand the concepts of Object-Oriented Programming Paradigm and the programming constructs of C++.							

S.No.	List of Experiments / Programmes	Knowledge Levels	Sessions
1	Program using Class and Object.	K1	4
2	Program using C++ operators.	K1	4
3	Program using Decision-making statements.	K1	4
4	Program using Loop Statements.	K2	4
5	Program using Library function.	K2	4
6	Program using Inline Function.	K3	4
7	Program in Passing object to function	K3	4
8	Program in Returning object from function.	K4	4
9	Program using Constructor and Destructor.	K4	4
10	Program using Function Overloading.	K3	4
11	Program using Virtual Function.	K3	4
12	Program using Static data members and member functions.	K4	4

13	Program using Inheritance.	K4	4
14	Program using Command line arguments.	K4	4
15	Program using File Handling	K5	4
Course Outcome	**CO1:** Understand the concepts of Object-Oriented Programming Paradigm and the programming constructs of C++.	K1	
	CO2: Illustrate the concept of Virtual Classes, inline functions and friend function.	K2	
	CO3: Identify suitable programming constructs for problem solving.	K3	
	CO4: Compare the different types of inheritance.	K4	
	CO5: Evaluate file concept.	K5	

Learning Resources				
Text Books	1. Ashok N Kamthane, Object-Oriented Programming with Ansi and Turbo C++, Pearson Education, 2003.			
Reference Books	1. E. Balagurusamy, Object-Oriented Programming with C++, TMH, 1998. 2. Maria Litvin& Gray Litvin, C++ for you, Vikas publication, 2002. 3. John R Hubbard, Programming with C, 2nd Edition, TMH publication, 2002.			
Website Link	1. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview 2. https://onlinecourses.swayam2.ac.in/arp19_ap79/preview			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UAMP01	**PROGRAMMING IN C++**	**DSC PRACTICAL - I**	**I**	**5**	**-**	**-**	**5**	**3**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Sample programs related to topic.
Teaching and Learning Methods	Handling practical session through projector.
Assessment Methods	Observation, Model practical's.

Designed By	Verified By	Approved By
Mrs.N.Hyrunnisha	**HoD Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M2UAMC02	**PROGRAMMING IN JAVA**	**DSC THEORY-II**	**II**	**5**	**5**	**-**	**-**	**5**

Objective	Students can learn how to implement object-oriented designs with Java.

Unit	Course Content	Knowledge Levels	Sessions
I	**Fundamentals of OOP: Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – **Application of Object Oriented Programming. Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www – Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine.	K1	13
II	**Variables & Control Structures:** Constants, Variables, Data Types - Operators and Expressions – **Decision Making and Branching:** if, if...else, nested if, switch? : Operator - **Decision Making and Looping:** while, do, for – Jumps in Loops - Labeled Loops – Classes, Objects and Methods	K2	12
III	**Arrays & Classes:** Arrays, Strings and Vectors – **Interfaces:** Multiple Inheritance – **Packages:** Putting Classes together – Multi threaded Programming.	K3	11
IV	**Error Handling & Graphics:** Managing Errors and Exceptions – Applet Programming – Graphics Programming.	K4	12
V	**I/O Stream Managing Input / Output Files in Java:** Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive Data Types – Random Access Files. **Current trends:** *Java in AI *	K5	12
	…… Self Study.		

Course Outcome	**CO1:** Recall the basic concepts and fundamentals of platform independent Object Oriented language.	K1	
	CO2: Understand the basic concepts of variables and constants.	K2	
	CO3: Apply the concept arrays and multithreading.	K3	
	CO4: Analyze the file concepts.	K4	
	CO5: Evaluate programs and spot the errors.	K5	

Learning Resources				
Text Books	1. E. Balaguruswamy, Programming with Java – A Primer - 3rd Edition, TMH.			
Reference Books	1. Patrick Naughton & Hebert Schildt, The Complete Reference Java 2 - 3rd Edition, TMH 2. John R. Hubbard,Programming with Java – 2nd Edition, TMH			
Website Link	1. https://www.javatpoint.com/jsf-web-resources 2. https://www.computerscience.org/resources/java/ 3. https://www.w3schools.com/java/java_intro.asp			
Self-Study Material	https://www.tutorialspoint.com/how-java-is-helpful-for-artificial-intelligence-ai			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M2UAMC02	**PROGRAMMING IN JAVA**	**DSC THEORY-II**	**II**	**5**	**5**	**-**	**-**	**5**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mrs.N.Hyrunnisha	**HoD Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M2UAMP02	**PROGRAMMING IN JAVA**	**DSC PRACTICAL - II**	**II**	**5**	**-**	**-**	**5**	**3**
Objective	Students can learn how to implement object-oriented designs with Java.							

S.No.	List of Experiments / Programmes	Knowledge Levels	Sessions
1	Program using Class and Object.	K1	5
2	Program using Constructors.	K1	4
3	Program using Command-Line Arguments.	K1	4
4	Program using Random Class.	K2	4
5	Program using Vectors.	K2	4
6	Program using String Tokenizer Class.	K3	4
7	Program using Interface.	K3	5
8	Program using all forms of Inheritance.	K4	4
9	Program using String class.	K4	4
10	Program using String Buffer class.	K3	4
11	Program using Exception Handling.	K3	4

12	Implementing Thread based applications	K4	4
13	Program using Packages.	K4	5
14	Program using Files.	K5	5
Course Outcome	**CO1:** Recall the basic concepts and fundamentals of platform independent Object Oriented language.	K1	
	CO2: Understand the basic concepts of variables and constants.	K2	
	CO3: Apply the concept of arrays and multithreading.	K3	
	CO4: Analyze the file concepts.	K4	
	CO5: Evaluate programs and spot the errors.	K5	

Learning Resources				
Text Books	1. E. Balaguruswamy,Programming with Java – A Primer - 3rd Edition, TMH.			
Reference Books	1. Patrick Naughton & Hebert Schildt,The Complete Reference Java 2 - 3rd Edition, TMH 2. John R. Hubbard,Programming with Java – 2nd Edition, TMH			
Website Link	1.https://www.javatpoint.com/jsf-web-resources 2.https://www.computerscience.org/resources/java/ 3.https://www.w3schools.com/java/java_intro.asp			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M2UAMP02	**PROGRAMMING IN JAVA**	**DSC PRACTICAL - II**	**II**	**5**	**-**	**-**	**5**	**3**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	M	S	S	S	S	M	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Sample programs related to topic.
Teaching and Learning Methods	Handling practical session through projector.
Assessment Methods	Observation, Model practical's.

Designed By	Verified By	Approved By
Mrs.N.Hyrunnisha	**HoD Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M3UAMC03	**PROGRAMMING IN PYTHON**	**DSC THEORY -III**	**III**	**5**	**5**	**-**	**-**	**5**
Objective	Students can comprehend the basic programming constructs like operators, expressions, decision making statements and Looping statements, Lists, tuples and error handling mechanisms.							

Unit	Course Content	Knowledge Levels	Sessions
I	**BASICS:** Python - Variables - Executing Python from the Command Line - Editing Python Files -Python Reserved Words - Basic Syntax-Comments - Standard Data Types – Relational Operators -Logical Operators - Bit Wise Operators - Simple Input and Output.	K1	12
II	**CONTROL STATEMENTS, LISTS, TUPLES CONTROL STATEMENTS:** Control Flow and Syntax - Indenting - if Statement - statements and expressions- string operations- Boolean Expressions -while Loop - break and continue - for Loop. LISTS: List-list slices - list methods - list loop–mutability–aliasing - cloning lists - list parameters. TUPLES: Tuple assignment, tuple as return value -Sets–Dictionaries.	K2	12
III	**FUNCTIONS:** Definition - Passing parameters to a Function - Built-in functions- Variable Number of Arguments - Scope – Type conversion Type coercion-Passing Functions to a Function – Mapping Functions in a Dictionary – Lambda - Modules - Standard Modules – sys – math – time - dir – help Function	K3	12
IV	**ERROR HANDLING:** Run Time Errors - Exception Model - Exception Hierarchy - Handling Multiple Exceptions - Data Streams - Access Modes Writing - Data to a File Reading - Data From a File - Additional File Methods - Using Pipes as Data Streams - Handling IO Exceptions - Working with Directories.	K4	12

V	**OBJECT ORIENTED FEATURES:** Classes Principles of Object Orientation - Creating Classes -Instance Methods - File Organization - Special Methods - Class Variables – Inheritance – Polymorphism - Type Identification - Simple Character Matches - Special Characters – Character Classes – Quantifiers - Dot Character - Greedy Matches – Grouping - Matching at Beginning or End - Match Objects – Substituting - Splitting a String - Compiling Regular Expressions**.*Current Trends: Python in Machine learning and Artificial Intelligence***	K5	12
	***……* Self Study.**		
Course Outcome	**CO1:** Recite the various basic programming constructs like operators, expressions, decision making statements and Looping statements.	K1	
	CO2: Summarize the concept of lists, tuples, functions and error handling.	K2	
	CO3: Apply the concept of Decision making statements, looping constructs , functions for solving basic programs.	K3	
	CO4: Analyze the concepts of Lists, tuples and error handling mechanisms.	K4	
	CO5: Evaluate a program incorporating all the python language constructs.	K5	
Learning Resources			
Text Books	1. Mark Summerfield —Programming in Python 3: A Complete introduction to the Python Language, Addison-Wesley Professional, 2009. 2. Martin C. Brown, —PYTHON: The Complete Reference‖, McGraw-Hill, 2001		
Reference Books	1.Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O_=Reilly Publishers, 2016. 2. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011. 3. Kenneth A. Lambert(2012), Fundamentals of Python: First Programs, C engage Learning.		

Website Link	1. https://en.wikipedia.org/wiki/Python_(programming_language) 2. https://www.w3schools.com/python/python_intro.asp 3. https://www.geeksforgeeks.org/python-programming-language-tutorial/			
Self-Study Material	https://www.kellton.com/kellton-tech-blog/top-python-development-trends			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C- Credit**

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M3UAMC03	**PROGRAMMING IN PYTHON**	**DSC THEORY-III**	**III**	**5**	**5**	**-**	**-**	**5**	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	M	L	M	S	L	M	L
CO2	M	L	M	L	S	M	L	M	L	S
CO3	S	M	L	L	L	S	M	L	L	L
CO4	S	S	S	M	L	S	S	S	M	L
CO5	M	S	L	M	S	M	S	L	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mrs.K.Gayathri	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M3UAMP03	**PYTHON PROGRAMMING**	**DSC PRACTICAL - III**	**III**	**4**	**-**	**-**	**4**	**3**
Objective	Students can apply the concepts of Python to solve problem solving problems and to implement basic programming constructs and various computing strategies for Python-based solutions to real world problems.							

S.No.	List of Experiments / Programmes	Knowledge Levels	Sessions
1	Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user‘s choice	K1	3
2	Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria: Grade A: Percentage >=80 Grade B: Percentage >=70 and 80 Grade C: Percentage >=60 and =40 and < 40	K1	3
3	Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters 60 from user.	K1	3
4	Write a Python script that prints prime numbers less than 20.	K2	3
5	Program to find factorial of the given number using recursive function.	K2	3
6	Write a Python program to count the number of even and odd numbers from array of N numbers	K3	3
7	Write a Python class to reverse a string word by word.	K3	3

8	Given a tuple and a list as input, write a program to count the occurrences of all items of the list in the tuple. (Input : tuple = ('a', 'a', 'c', 'b', 'd'), list = ['a', 'b'], Output : 3)	K4	3
9	Create a Savings Account class that behaves just like a Bank Account, but also has an interest rate and a method that increases the balance by the appropriate amount of interest (Hint :use Inheritance).	K3	4
10	Write a Python program to construct the following pattern, using a nested loop * ** *** **** ****** **** *** ** *	K3	3
11	Read a file content and copy only the contents at odd lines into a new file.	K4	3
12	Create a Turtle graphics window with specific size.	K4	4
13	Write a Python program for Towers of Hanoi using recursion	K4	4
14	Create a menu driven Python program with a dictionary for words and their meanings.	K4	4
15	Devise a Python program to implement the Hangman Game.	K4	4
Course Outcome	**CO1:** Identify the problem solving approaches.	K1	
	CO2: Summarize the basic programming constructs in Python.	K2	
	CO3: Relate various computing strategies for Python-based solutions to real world problems.	K3	
	CO4: Illustrate Python data structures - lists, tuples, and dictionaries.	K4	

	CO5: Plan the program using input/output with files in Python.	K5

Learning Resources				
Text Books	1. Mark Summerfield—Programming in Python 3: A Complete introduction to the Python Language, Addison-Wesley Professional, 2009. 2. Martin C. Brown —PYTHON: The Complete Reference, McGraw-Hill, 2001			
Reference Books	1.Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O_Reilly Publishers, 2016. 2. Guido van Rossum and Fred L. Drake Jr —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011. 3. Kenneth A. Lambert- Fundamentals of Python: First Programs, C engage Learning(2012).			
Website Link	1. https://en.wikipedia.org/wiki/Python_(programming_language) 2. https://www.w3schools.com/python/python_intro.asp 3. https://www.geeksforgeeks.org/python-programming-language-tutorial/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards										
Course Code	**Course Title**		**Course Type**		**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M3UAMP03	**PYTHON PROGRAMMING**		**DSC PRACTICAL - III**		**III**	**4**	**-**	**-**	**4**	**3**

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	L	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Sample programs related to topic.
Teaching and Learning Methods	Handling practical session through projector.
Assessment Methods	Observation, Model practical's.

Designed By	Verified By	Approved By
Mrs.K.Gayathri	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M4UAMC04	**R PROGRAMMING**	**DSC THEORY - IV**	**IV**	**5**	**5**	**-**	**-**	**5**
Objective	Students can able to learn the basic programming constructs and data structures, input/output operations, Data frames, Vectors and Scalar in R Programming.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introducing to R** Introducing to R – R Data Structures – Help Functions in R – Vectors – Scalars – Declarations – Recycling – Common Vector Operations – Using all and any – Vectorized operations – NA and NULL values – Filtering – Victoriesed if-then else – Vector Element names.	K1	12
II	**Matrices** Creating matrices – Matrix Operations – Applying Functions to Matrix Rows and Columns – Adding and deleting rows and columns - Vector/Matrix Distinction – Avoiding Dimension Reduction – Higher Dimensional arrays – lists – Creating lists – General list operations – Accessing list components and values – applying functions to lists – recursive lists.	K2	12
III	**Data Frames** Creating Data Frames – Matrix-like operations in frames – merging Data frames – Applying functions to Data Frames – Factors and Tables – Factors and levels – Common Functions used with factors – Working with tables – Other factors and table related functions – Control statements – Arithmetic and Boolean operators and values – Default Values for arguments – Returning Boolean Values – Functions are objects – Environment and scope issues – Writing Upstairs – Recursion – Replacement functions – Tools for Composing function code – Math and Simulation in R. –Stack –Hash tables – String class.	K3	12

IV	**Classes** S3Classes – S4 Classes -Managing your objects – Input/output – accessing keyboard and monitor – reading and writing files – accessing the internet – String Manipulation – Graphics – Creating Graphs – Customizing Graphs – Saving Graphs to files – Creating Three-Dimensional plots.	K4	12
V	**Interfacing R** Interfacing R to other languages – Parallel R – Basic Statistics – Linear Model – Generalized Linear models – Non-linear Models – Time Series and Auto-Correlation – Clustering. . **Current Trends -* Data Fabric. ***	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Recall the fundamental ideas behind R Programming.	K1	
	CO2: Infer the concepts constructs, control statements, string functions in R programming.	K2	
	CO3: Apply various mining algorithms for handling large volumes of data, and imparting knowledge on techniques.	K3	
	CO4: Analyze techniques to address specific challenges in text analysis.	K4	
	CO5: Appraise statistical models using statistical perspective and creativity in statistical application within R.	K5	

Learning Resources	
Text Books	1.P.Naughton and H.Schildt, Java 2 (The Complete Reference), Third Edition, Tata MCGraw Hill Edition, 1999. 2.Norman Matloff, "The Art of R Programming - A Tour of Statistical Software Design", 2011.
Reference Books	1. Mark Gardner, Beginning R – The Statistical Programming Language, Wiley, 2013. 2. Robert Knell, —Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and programming in R, Amazon Digital South Asia Services Inc, 2013.
Website Link	1. https://www.w3schools.com/r/default.asp 2. https://www.tutorialspoint.com/r/index.htm 3. https://www.javatpoint.com/r-tutorial
Self-Study Material	1. https://www.starburst.io/data-glossary/data-fabric/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards										
Course Title	**Course Title**		**Course Type**		**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M4UAMC04	**R PROGRAMMING**		**DSC THEORY - IV**		**IV**	**5**	**5**	**-**	**-**	**5**

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	M	S
CO2	L	M	L	S	M	S	S	M	S	S
CO3	M	S	S	M	S	S	S	S	M	S
CO4	S	M	M	S	S	S	M	M	S	M
CO5	S	S	M	M	M	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mrs.V.Krishnaveni	**HOD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M4UAMP04	**R PROGRAMMING**	**DSC PRACTICAL - IV**	**IV**	**5**	**-**	**-**	**5**	**3**
Objective	Student can able to learn the concept of R for Big Data analytics, Text processing and statistical perspective.							

S.No.	List of Experiments / Programmes	Knowledge Levels	Sessions
1	Demonstrate use of Data Structures in R.	K1	6
2	Manipulation of vectors and matrix.	K1	6
3	Implement Operators on Factors in R.	K2	6
4	Build a code using Data Frames in R.	K2	6
5	Demonstrate use of Lists and Operators.	K3	6
6	Demonstrate use of looping statements.	K3	6
7	Implement Graphs in R.	K4	6
8	Construct code for 3D plots in R.	K5	6
Course Outcome	**CO1:** Recognize the concepts of Data structures in R.	K1	
	CO2: Summarize the concepts of Vectors, Looping statement in R.	K2	
	CO3: Apply graph for manipulating large datasets in R.	K3	
	CO4: Analyse various concepts of R language to devise efficient solutions for problem-solving.	K4	
	CO5: Recommend real time application using 3D plots in R language.	K5	

Learning Resources	
Text Books	1.P.Naughton and H.Schildt, Java 2 (The Complete Reference), Third Edition, Tata MCGraw Hill Edition, 1999. 2. Norman Matloff, "The Art of R Programming - A Tour of Statistical Software Design", 2011.

Reference Books	1. Mark Gardner, Beginning R – The Statistical Programming Language, Wiley, 2013. 2. Robert Knell, —Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and programming in R, Amazon Digital South Asia Services Inc, 2013.			
Website Link	1. https://www.w3schools.com/r/default.asp 2. https://www.tutorialspoint.com/r/index.htm 3. https://www.javatpoint.com/r-tutorial			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards										
Course Title	**Course Title**		**Course Type**		**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M4UAMP04	**R PROGRAMMING**		**DSC PRACTICAL - IV**		**IV**	**5**	**-**	**-**	**5**	**3**

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	L	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Sample programs related to topic.
Teaching and Learning Methods	Handling practical session through projector.
Assessment Methods	Observation, Model practical's.

Designed By	Verified By	Approved By
Mrs.V.Krishnaveni	**HOD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAMC05	**MACHINE LEARNING TECHNIQUES**	**DSC THEORY-V**	**V**	**6**	**4**	**2**	**-**	**5**
Objective	Student can develop the computational models of human learning process and perform computer simulations.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction Machine Learning**: Difference between AI, Machine Learning and Big data. Supervised and unsupervised learning, parametric vs non-parametric models, parametric models for classification and regression- Linear Regression, Logistic Regression, Naïve Bayes classifier, simple non-parametric classifier-K-nearest neighbor, support vector machines.	K1	12
II	**Neural networks and genetic algorithms:** Neural Network Representation – Problems – Perceptions – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.	K2	12
III	**Bayesian and computational learning** :Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.	K3	12

IV	**Instant based learning K- Nearest Neighbor Learning**: Locally weighted Regression – Radial Basis Functions – Case Based Learning.	K4	12
V	**Advanced learning Recommendation systems**: Opinion mining, sentiment analysis. Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q Learning – Temporal Difference Learning. **Current Trends-***Recent trends of machine learning techniques ***.**	K5	12
	*……*Self Study.		
Course Out come	**CO1:** Understand a very broad collection of machine learning algorithms and problems.	K1	
	CO2: Demonstrate the importance of visualization in the dat solution**.**	K2	
	CO3: Apply structured thinking to unstructured problems.	K4	
	CO4: List the algorithmic topics of machine learning and mathematically deep enough to introduce the required theory.	K4	
	CO5: Value an appreciation for what is involved in learning from data.	K5	
Learning Resources			
Text Books	1. Tom M. Mitchell, —Machine Learning, McGraw-Hill Education (India) Private Limited, 2013. 2. Bengio,Yoshua, Ian J. Good fellow, and Aaron Courville. "Deep learning" 2015, MIT Press.		

Reference Books	1.Ethem Alpaydin, —Introduction to Machine Learning (Adaptive ComputationandMachine Learning), The MIT Press 2004. 2. Stephen Marsland, —Machine Learning: An Algorithmic Perspective, CRC Press, 2009.			
Website Link	1. https://www.javatpoint.com/machine-learning-techniques. 2. https://www.tableau.com/learn/articles/top-machine-learning-methods.			
Self-Study Material	1. https://www.youtube.com/watch?v=o81CjXX9Hpw.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Title	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAMC05	**MACHINE LEARNING TECHNIQUES**	**DSC THEORY**	**V**	**6**	**4**	**2**	**-**	**5**

CO - PO Mapping

CON umber	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	M	S	S	S
CO2	M	M	S	S	M	S	S	M	S	S
CO3	M	S	S	M	S	S	S	S	S	S
CO4	S	M	M	S	S	S	M	S	S	S
CO5	S	S	S	M	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mr.M.Ravi	**HOD - Mr.G.Selvakumar**	**Member Secretary Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAMP05	**MACHINE LEARNING LAB**	**DSC PRACTICAL - V**	**V**	**6**	**-**	**-**	**6**	**3**
Objective	Student can able to apply the concepts of Machine Learning to solve real-world problems and to implement basic algorithms in clustering & classification applied to text & numeric data.							

S.No.	List of Experiments / Programmes	Knowledge Levels	Sessions
1	Solving Regression & Classification using Decision Trees	K1	6
2	Root Node Attribute Selection for Decision Trees using Information Gain.	K1	6
3	Bayesian Inference in Gene Expression Analysis	K1	6
4	Pattern Recognition Application using Bayesian Inference	K2	6
5	Bagging in Classification	K2	6
6	Bagging, Boosting applications using Regression Trees	K3	6
7	Data & Text Classification using Neural Networks	K3	6
8	Using Weka tool for SVM classification for chosen domain application	K4	6
9	Data & Text Clustering using K-means algorithm	K4	6
10	Data & Text Clustering using Gaussian Mixture Models	K3	6

Course Outcome	**CO1:** Recall the various machine learning tools	K1
	CO2: Understand the procedures for machine learning algorithms	K2
	CO3: Sketch Python programs for various machine learning algorithms	K3

	CO4: Analyze the appropriate datasets to the Machine Learning algorithms	K4
	CO5: Appraise the graphical outcomes of learning algorithms with specific datasets	K5

Learning Resources				
Text Books	1 Tom M. Mitchell, —Machine Learning, McGraw-Hill Education (India) Private Limited, 2013. 2 Bengio, Yoshua, Ian J. Goodfellow, and Aaron Courville. "Deep learning" 2015, MIT Press			
Reference Books	1. Ethem Alpaydin, —Introduction to Machine Learning (Adaptive Computation and Machine Learning), The MIT Press 2004. 2. Stephen Marsland, —Machine Learning: An Algorithmic Perspective, CRC Press, 2009.			
Website Link	1. https://professional.mit.edu/course-catalog/professional-certificate- program-machine-learning-artificial-intelligence-0 2. https://www.edx.org/learn/machine-learning			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M5UAMP05	**MACHINE LEARNING LAB**	**DSC PRACTICAL - V**	**V**	**6**	**-**	**-**	**6**	**3**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	L	S	S	S
CO2	M	M	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	M	S	M	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Sample programs related to topic.
Teaching and Learning Methods	Handling practical session through projector.
Assessment Methods	Observation, Model practical's.

Designed By	Verified By	Approved By
Mr.M.Ravi	**HoD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAMC06	**DEEP LEARNING**	**DSC THEORY - VI**	**V**	**6**	**4**	**2**	**-**	**5**
Objective	Student can understand the basic concepts and techniques of Deep Learning, apply machine learning principles and to create applications using Tensor Flow.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Learning:** The Neural Network – Limits of Traditional Computing – Machine Learning – Neuron – FF Neural Networks – Types of Neurons – Soft max output layers.	K1	12
II	**Deep Learning Models**: Tensor flow – Variables – Operations – Place holders – Sessions – Sharing Variables – Graphs – Visualization.	K2	12
III	**CNN Convolution** Neural Network – Feature Selection – Max Pooling – Filters and Feature Maps – Convolution Layer – Applications	K3	12
IV	**RNN Recurrent** Neural Network – Memory cells – sequence analysis – word2vec- LSTM — Memory augmented Neural Networks – 15 NTM—Application	K4	12
V	**Reinforcement Learning** - Reinforcement Learning – MDP – Q Learning – Application. **Current Trends**: *Introduction to diffusion models for machine learning*	K5	12
	…. **Self Study**		
Course Outcome	**CO1:** Recite the main fundamentals that drive Deep Learning	K1	
	CO2: Understand**,** build, train and apply fully connected deep neural networks.	K2	
	CO3: Apply efficient CNN or RNN.	K3	

	CO4: Analyse the key features in a neural network's architecture.	K4	
	CO5: Evaluate reinforcement learning with an example.	K5	

Learning Resources				
Text Books	1.Nikhil Buduma, Nicholas Locascio, —Fundamentals of Deep Learning: Designing Next Generation Machine Intelligence Algorithms, O'Reilly Media, 2017			
Reference Books	1.Ian Goodfellow, YoshuaBengio, Aaron Courville, Deep Learning (Adaptive computation and Machine Learning series‖, MITPress, 2017.			
Website Link	1. https://www.ibm.com/think/topics/ai-vs-machine-learning-vs-deep-learning-vs-neural-networks 2. https://www.javatpoint.com/reinforcement-learning			
Self-Study Material	1. https://www.superannotate.com/blog/diffusion-models			
	L-Lecture	T-Tutorial	P-Practical	C- Credit

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B.Sc Computer Science (Artificial Intelligence and Machine Learning) Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAMC06	**DEEP LEARNING**	**DSC THEORY - VI**	**V**	**6**	**4**	**2**	**-**	**5**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO 3	PSO 4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	M	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mrs.N.Padmapriya	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAMC07	**NATURAL LANGUAGE PROCESSING**	**DSE THEORY - VII**	**VI**	**5**	**5**	**-**	**-**	**5**
Objective	Student to learn fundamental concepts, analytics techniques of natural language, various NLP technologies and frameworks.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to NLP Introduction:** application of NLP techniques and key issues- MT grammer checkers- dictation – document generation- NL interfaces- Natural language processing key issues- the different analysis level used for NLP: morpho - lexical - syntactic - semantic - pragmatic markup(TEI, UNICODE)-finite state automata- Recursive and augmented transition networks- open problems.	K1	11
II	**Lexical Level Lexical level:** error tolerant lexical processing (spelling error correction)-transducers for the design of morphologic analyzers features-towards syntax: part-of-speech taggingv(BRILL,HMM)- efficient representations for linguistic resources(lexica, grammars,….) tries and finite state automata.	K2	12
III	**Syntactic Level Syntactic level:** grammars(eg.formal /Chomsky hierarchy, DCSGs, systematic case, unification, stochastic)-parsing (top down, bottom up, char (early algorithm), CYK algorithm)- automated estimation of probabilistic model parameters(inside-outside algorithm)- data oriented parsing grammar formalisms and tree banks- efficient patsing for context-free grammars (CFGs)- statistcial parsing and probabilistic CFGs (PCFGs)-lexicilized PCFGse.	K3	12

IV	**Semantic Level Semantic level:** logical forms - ambiguity resolution - semantic network and parsers -procedural semantics - montague semantics- vector space approaches - distributional semantics-lexical semantics and word sense disambiguation-compositional semantics 18 semantic role labeling and sematic parsing	K4	12
V	**Pragmatic Level Pragmatic level:** knowledge representation-reasoning plan/goal recognition –speech acts/intentions – belief models- discourse reference. Natural language generation: content determination – sentence planning-surface realization, subjectivity and sentiment analysis: information extraction – automatic summarization-information retrieval and question answering– named entity recognition and relation extraction. **Current Trends:*** Advancements in sentiment analysis**.**	K5	13
	…… Self Study.		
Course Outcome	**CO1:** State the fundamental concepts and techniques of Natural Language Processing (NLP)	K1	
	CO2: Understand of the models and algorithms in the field of NLP.	K2	
	CO3: Utilize the computational properties of natural languages and the commonly used algorithms for processing linguistic information.	K3	
	CO4: Examine semantics and pragmatics of languages for processing.	K4	
	CO5: Inspect he capabilities and limitations of current natural language technologies, and some of the algorithms and techniques that underlie these technologies.	K5	

Learning Resources				
Text Books	1. Danie lJ and JamesH. Martin, An Introduction to natural language processing, computation a linguistics and speech recognition prenticehall, 2009.			
Reference Books	1. LanH Written and Elbef, Mark A. Hall, datamining: practical machine learning tools and techiniques, Morgan Kaufmann, 2013. 2. Mohamed ZakariaKurdi, Natural Language Processing and Computational Linguistics 1, speech, Morphology, and syntax, wiley, ISTE Ltd, 2016.			
Website Link	https://onlinecourses.swayam2.ac.in/arp19_ap79/preview https://onlinecourses.swayam2.ac.in/aic20_sp06/preview			
Self-Study Material	https://monkeylearn.com/sentimentanalysis/#:~:text=Sentiment%20analysis%20(or%20opinion%20mining,feedback%2C%20and%20understand%20customer%20needs.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning

Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M6UAMC07	NATURAL LANGUAGE PROCESSING	DSE THEORY - VII	VI	5	5	-	-	5

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	S	M	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Ms. R. Shanmugavalli	HOD – Mr. G. Selvakumar	Member Secretary Dr. S. Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAMP06	**NATURAL LANGUAGE PROCESSING LAB**	**DSC PRACTICAL - VI**	**VI**	**5**	**-**	**-**	**5**	**3**
Objective	Student can learn the fundamental concepts and techniques of natural language processing (NLP).							

S.No.	Course Content	Knowledge Levels	Sessions
1	Implementing word similarity	K1	10
2	Implementing simple problems related to word disambiguation	K2	10
3	Simple demonstration of part of speech tagging.	K2	10
4	Lexical analyzer.	K3	10
5	Semantic analyzer.	K4	10
6	Sentiment Analysis.	K5	10
Course Outcome	**CO1:** Define the syntax, semantics, and pragmatics of a statement written in a natural language.	K1	
	CO2: Demonstrate the conversational agent that uses natural language understanding and generation.	K2	
	CO3: Build the significance of research in natural language processing for common NLP tasks to engage in lifelong learning	K3	
	CO4: Analyze the linguistic foundations that underlie natural language processing.	K4	

	CO5: Compare the linguistic information in various tasks such as Machine translation, Information extraction and retrieval, and Speech Technology.	K5	

Learning Resources	
Text Books	1. Danie lJ and JamesH. Martin, An Introduction to natural language processing, computation a linguistics and speech recognition prenticehall, 2009.
Reference Books	1. LanH Written and Elbef, Mark A. Hall, datamining: practical machine learning tools and techiniques, Morgan Kaufmann, 2013. 2. Mohamed ZakariaKurdi, Natural Language Processing and Computational Linguistics 1, speech, Morphology, and syntax, wiley, ISTE Ltd, 2016.
Website Link	1. https://onlinecourses.swayam2.ac.in/aic20_sp06/preview 2. https://onlinecourses.swayam2.ac.in/arp19_ap79/preview

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning

Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M6UAMP06	NATURAL LANGUAGE PROCESSING LAB	DSC PRACTICAL - VI	VI	5	-	-	5	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	M	S	S	M	S	S
CO2	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	M	M	S	S	M	S	S
CO4	S	M	S	M	M	S	S	M	S	S
CO5	S	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Sample programs related to topic.
Teaching and Learning Methods	Handling practical session through projector.
Assessment Methods	Observation, Model practical's.

Designed By	Verified By	Approved By
Ms.R.Shanmugavalli	HOD – Mr. G. Selvakumar	Member Secretary Dr. S. Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAMC08	**ARTIFICIAL INTELLIGENCE**	**DSC THEORY - VIII**	**VI**	**5**	**5**	**-**	**-**	**5**
Objective	Student can learn the basics method to solving problems using Artificial Intelligence, concept of Expert system, Fuzzy logic.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Artificial Intelligence:** What is Artificial Intelligence? AI Technique, Representation of a problem as State space search, production systems, Problem characteristics, Production System characteristics – Issues in the design of search programs, Heuristic Search Techniques - Generate & Test Hill Climbing, Best First search, Problem reduction, Constraint satisfaction, Means-End Analysis.	K1	12
II	**Knowledge Representation**: Approaches and issues in knowledge representation –Using Predicate Logic – Representing simple facts in logic – Representing Instance and ISA relationship – Computable functions and predicates – resolution – Natural deduction - Representing knowledge using rules –Procedural versus declarative knowledge – Logic programming - Forward versus backward reasoning – Matching – Control Knowledge - Symbolic reasoning under uncertainty - Logics for Nonmonotonic reasoning – Implementation Issues – Augmenting a problem solver – Implementation: Depth first search, Breadth first search.	K2	12
III	**Statistical Reasoning:** Probability and Bayes‟ Theorem - Certainty factors and rule-based systems- Bayesian networks – Dempster - Shafer Theory - Weak slot-filler structure - Semantic nets – frames. Strong slot-filler structure- Conceptual dependency – Scripts – CYC – Syntatic – Semantic spectrum of	K3	12

	Representation – Logic and slot-and-filler structure – Other representational Techniques.		
IV	**Game Playing, Planning & NLP** Minimax search procedure- Adding alpha-beta cutoffs- Additional Refinements – Iterative Deepening – Reference on specific games Planning - Components of a Planning system – Goal stack planning – Nonlinear planning using constraint posting- Hierarchical planning – Reactive systems.Natural Language Processing - Syntactic Analysis, Semantic Analysis, Discuses and Pragmatic Processing – Statistical Natural Language processing.	K4	12
V	**Learning & Advanced Topics in AI** What is learning? – Rote learning – Learning by taking advice – Learning in problem solving – Learning from examples: Induction – Explanation based learning – Discovery – Analogy – Formal learning theory - Neural Net learning and Genetic learning - Expert System: Representation-Expert System shells-Knowledge Acquisition. Fuzzy logic system – Crisp sets – Fuzzy sets – Fuzzy terminology – Fuzzy logic control – Sugeno style of Fuzzy inference processing – Fuzzy Hedges – Neuro Fuzzy systems. **Current Trends**: *Multimodal Artificial Intelligence.*	K5	12
	…… Self Study……		
Course Outcome	**CO1:** Define the basics of Design user interfaces to improve human–AI interaction.	K1	
	CO2: Understand the basic principles of AI in solutions that require problem solving.	K2	
	CO3: Build awareness and a fundamental understanding of various applications of AI techniques.	K3	
	CO4: Correlate information from text automatically using concepts and methods from natural language processing (NLP)	K4	

	CO5: Support robotic process automation to manage business processes.	K5	

Learning Resources				
Text Books	Elaine Rich, Kevin Knight (2008), Shivsankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw Hill Publication.			
Reference Books	1. Russel S, Norvig P (2010), Artificial Intelligence : A Modern approach,Third Edition, Pearson Education 2. Dan W Patterson (2007), Introduction to Artificial Intelligence and Expert System, Second Edition, Pearson Education Inc. 3. Jones M(2006), Artificial Intelligence application Programming, Second Edition, Dreamtech Press 4. Nilsson (2000), Artificial Intelligence : A new synthesis, Nils J Harcourt Asia PTE Ltd.			
Website Link	https://people.engr.tamu.edu/guni/csce421/files/AI_Russell_Norvig.pdf			
Self-Study Material	https://www.aimesoft.com/multimodalai.html			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M6UAMC08	**ARTIFICIAL INTELLIGENCE**	**DSC THEORY - VIII**	**VI**	**5**	**5**	**-**	**-**	**5**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	**Verified By**	**Approved By**
Mr. C. Suresh Kumar	**HOD – Mr. G. Selvakumar**	**Member Secretary – Dr.S.Shahitha**

List of Foundation Course (FC) offered by the B.Sc., Computer Science – Artificial Intelligence and Machine Learning SYLLABUS - LOCF-CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2024-2025 Onwards	
COURSE_CODE	**TITLE OF THE COURSE**
24M1UAMFC1	Problem Solving Techniques

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UAMFC1	**PROBLEM SOLVING TECHNIQUES**	**FC - I**	**I**	**2**	**2**	**-**	**-**	**2**
Objective	Student to understand the different programming concepts, Decomposition of problems into functions, Use of data flow diagram, Pseudo code to implement solutions through algorithms.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** History, characteristics and limitations of Computer. **Hardware/Anatomy of Computer:** CPU, Memory, Secondary storage devices, Input Devices and Output devices. **Types of Computers:** PC, Workstation, Minicomputer, Main frame and Supercomputer. **Software:** System software and Application software. **Programming Languages:** Machine language, Assembly language, High level language, 4 GL and 5GL-Features of good programming language. **Translators:** Interpreters and Compilers.	K1	6
II	**Data:** Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC).**Structured Programming: Algorithm:** Features of good algorithm,Benefits and drawbacks of algorithm. **Flowcharts:** Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts.**Pseudocode:** Writing a pseudocode. Coding, documenting and testing a program, Comment lines and types of errors.**Program design:** Modular Programming	K2	6
III	**Selection Structures:** Relational and Logical Operators - Selecting from Several Alternatives – Applications of	K3	6

	Selection Structures. **Repetition Structures:** Counter Controlled Loops –Nested Loops– Applications of Repetition Structures.		
IV	**Data:** Numeric Data and Character Based Data. **Arrays:** One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.	K4	6
V	**Data Flow Diagrams:** Definition, DFD symbols and types of DFDs. **Program Modules:** Subprograms-Value and Reference parameters- Scope of a variable - Functions – Recursion. **Files:** File Basics-Creating and reading a sequential file- Modifying Sequential Files. **Current Trends: what-is/5g/**	K5	6
	…… Self Study.		
Course Outcome	**CO1:** Recall the basic about computers.	K1	
	CO2: Understand the data types and arithmetic operations.	K2	
	CO3: Implement the various operators.	K3	
	CO4: Compare numeric and character-based data.	K4	
	CO5: Evaluate DFD.	K5	

Learning Resources	
Text Books	1. Stewart Venit, "Introduction to Programming: Concepts and Design", Fourth Edition, 2010, Dream Tech Publishers.
Reference Books	-
Website Link	1. https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm 2. https://www.hugedomains.com/domain_profile.cfm?d=utubersity.com
Self-Study Material	1. https://www.tutorialspoint.com/how-java-is-helpful-for-artificial-intelligence-ai 2. **https://aws.amazon.com/what-is/5g/**

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards										
Course Code	**Course Title**		**Course Type**		**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UAMFC1	**PROBLEM SOLVING TECHNIQUES**		**FC - I**		**I**	**2**	**2**	**-**	**-**	**2**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs.N.Hyrunnisha	HoD – Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

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	List of Elective Course (DSE) for B.Sc., Computer Science – Artificial Intelligence and Machine Learning SYLLABUS - LOCF-CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2024-2025 Onwards		
S.No.	**SEMESTER**	**COURSE_CODE**	**TITLE OF THE COURSE**
1	V	24M5UAME01	Analytics for Service Industry
2	V	24M5UAME02	Financial Analytics
3	V	24M5UAME03	Marketing Analytics
4	V	24M5UAME04	Data Communication And Computer Networks
5	V	24M5UAME05	Big Data Analytics
6	V	24M5UAME06	Computer Networks
7	V	24M5UAME07	Cryptography
8	V	24M5UAME08	Operating System
9	V	24M5UAME09	Artificial Neural Networks
10	VI	24M6UAME10	Software Engineering
11	VI	24M6UAME11	Software Quality Assurance
12	VI	24M6UAME12	Software Project Management
13	VI	24M6UAME13	Software Metrics
14	VI	24M6UAME14	Organizational Behavior
15	VI	24M6UAME15	Agile Project Management
16	VI	24M6UAME16	Computing Intelligence
17	VI	24M6UAME17	Information Security
18	VI	24M6UAME18	Grid Computing

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME01	**ANALYTICS FOR SERVICE INDUSTRY**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Students understand the fundamental concepts and techniques of healthcare, Human resource, hospitality and tourism data.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Healthcare Analytics :** Introduction to Healthcare Data Analytics Electronic Health Records– Components of EHR- Coding Systems Benefits of EHR- Barrier to Adopting HER Challenges-Phenotyping Algorithms. Biomedical Image Analysis and Signal Analysis- Genomic Data Analysis for Personalized Medicine. Review of Clinical Prediction Models.	K1	13
II	**Healthcare Analytics Applications :** Applications and Practical Systems for Healthcare– Data Analytics for Pervasive Health- Fraud Detection in Healthcare- Data Analytics for Pharmaceutical Discoveries- Clinical Decision Support Systems- Computer- Assisted Medical Image Analysis Systems- Mobile Imaging and Analytics for Biomedical Data.	K2	12
III	**HR Analytics:** Evolution of HR Analytics, HR information systems and data sources, HR Metric and HR Analytics, Evolution of HR Analytics; HR Metrics and HR Analytics; Intuition versus analytical thinking; HRMS/HRIS and data sources; Analytics frameworks like LAMP, HCM:21(r) Model.	K3	12
IV	**Performance Analysis:** Predicting employee performance, Training requirements, evaluating training and development, Optimizing selection and promotion decisions.	K4	11

V	**Tourism and Hospitality Analytics:** Guest Analytics – Loyalty Analytics – Customer Satisfaction – Dynamic Pricing – optimized disruption management – Fraud detection in payments. **Current Trends:* Predictive and Perspective Analysis*.**	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Recall the concepts and methods of business analytics.	K1	
	CO2: Illustrate the decision problems in different settings.	K2	
	CO3: Develop results/solutions and identify appropriate courses of action for a given managerial situation problem or an opportunity.	K3	
	CO4: Assume viable solutions to decision making problems.	K4	
	CO5: Assess a sense of ethical decision-making and a commitment to the long-run welfare of both organizations and the communities they serve.	K5	
Learning Resources			
Text Books	1. Chandan K. Reddy and Charu C Aggarwal, —Healthcare data analytics, Taylor & Francis, 2015. 2.Edwards Martin R, Edwards Kirsten (2016),—Predictive HR Analytics: Mastering the HR Metric, Kogan Page Publishers, ISBN-0749473924 3.Fitz-enzJac (2010), —The new HR analytics: predicting the economic value of your company‘s human capital investments, AMACOM, ISBN-13: 978-0-8144-1643-3 4. RajendraSahu, Manoj Dash and Anil Kumar. Applying Predictive Analytics Within the Service Sector.		
Reference Books	1. Hui Yang and Eva K. Lee, —Healthcare Analytics: From Data to Knowledge to Healthcare Improvement, Wiley, 2016 2. Fitz-enzJac, Mattox II John (2014), —Predictive Analytics for Human Resources, Wiley, ISBN- 1118940709.		
Website Link	1. https://yourbusiness.azcentral.com/examples-contemporary-issues-marketing-field- 26524.html		

	2. https://www.ukessays.com/essays/marketing/contemporary-issues-in-marketing-marketing-essay.php			
Self-Study Material	1. https://www.businessnewsdaily.com/8655-predictive-vs-prescriptive-analytics.html 2. https://segment.com/data-hub/predictive-analytics/prescriptive-vs-predictive-analytics/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M5UAME01	ANALYTICS FOR SERVICE INDUSTRY	DSE THEORY	V	5	3	2	-	4

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	S	M	M	S	S
CO2	S	S	M	M	S	S	S	M	M	S
CO3	S	M	S	S	S	S	M	M	S	S
CO4	M	S	S	M	S	S	M	M	S	S
CO5	S	S	S	S	S	M	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Ms.R. Shanmugavalli	HOD – Mr. G. Selvakumar	Member Secretary Dr. S. Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME02	**FINANCIAL ANALYTICS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Student can analyze and model financial data to construct and optimize asset portfolios, evaluate and model risk on various financial assets, acquire logical & analytical skills in financial analytics.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Financial Analytics:** Introduction: Meaning-Importance of Financial Analytics uses-Features-Documents used in Financial Analytics: Balance Sheet, Income Statement, Cash flow statement-Elements of Financial Health: Liquidity, Leverage, Profitability. Financial Securities: Bond and Stock investments - Housing and Euro crisis - Securities Datasets and Visualization - Plotting multiple series.	K1	12
II	**Descriptive Analytics:** Data Exploration, Dimension Reduction and Data Clustering Geographical Mapping, Market Basket Analysis. Predictive Analytics, Fraud Detection, Churn Analysis, Crime Mapping, Content Analytics, Sentiment Analysis. Analyzing financial data and implement financial models. Process of Data analytics: obtaining publicly available data, refining such data, implement the models and generate typical output, Prices and individual security returns, Portfolio returns, Risks, Factor Models.	K2	12
III	**Forecasting Analytics:** Estimating Demand Curves and Optimize Price, Price Bundling, Non Linear Pricing and Price Skimming, Forecasting, Simple Regression and Correlation Multiple Regression to forecast sales. Modeling Trend and Seasonality Ratio to Moving Average Method, Winter's Method.	K3	10

IV	**Business Intelligence &Tableau:** Definition of BI – A Brief History of BI – The Architecture of BI. The origin and Drivers of BI. Successful BI Implementation – Analytics Overview – Descriptive, Predictive and Perspective Analytics. Business reporting and Visualization – components - A brief history of data visualization – Different types of charts and graphs – The emergence of data visualization and visual analytics – Performance dashboards – Dashboard design – Best practices in dashboard design – Business performance management – Balanced Scorecards – Six sigma as a performance measurement system.	K4	14
V	**Visualizations:** Using Tableau to Summarize Data, Slicing and Dicing Financial Data, Charts to Summarize Marketing Data. Functions to Summarize Data, Pricing Analytics, and Risk based pricing, Fraud Detection and Prediction, Recovery Management, Loss Risk Forecasting, Risk Profiling, Portfolio Stress Testing. **Current Trends:*** Financial Analytics Market Comprehensive Analysis, Historical Data, and Forecasts*	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Choose and discuss the outputs of given financial models and create their own models.	K1	
	CO2: Demonstrate and create visualizations that clearly communicate financial data insights.	K2	
	CO3: Identify essential knowledge and hands-on experience in the data analysis process, including data scraping, manipulation, and exploratory data analysis.	K3	
	CO4: Analyze advanced applied financial modeling courses.	K4	

	CO5: Criticize leadership, teamwork and critical thinking skills for financial decision making.	K5	

Learning Resources				
Text Books	1. Gary Koop - Analysis of Economic Data, (4th Edition), Wiley. 2. David Ruppert, David S. Matteson, Springers- Statistics and Data Analysis for Financial Engineering: with R examples;			
Reference Books	1. Ang Clifford, Springers- Analyzing Financial Data and Implementing Financial Models Using "R", 2. Microsoft Excel 2013: Data Analysis and Business Modeling, Wayne L. Winston, Microsoft Publishing.			
Website Link	1. https://www.techtarget.com/searcherp/definition/financial-analytics 2. httpS://www.teradata.com/Glossary/What-is-Finance-Analytics			
Self-Study Material	1. http://ndl.ethernet.edu.et/bitstream/123456789/42033/1/34.pdf 2. https://faculty.econ.ucdavis.edu/faculty/cameron/e102/aedmast_march292015.pdf			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M5UAME02	FINANCIAL ANALYTICS	DSE THEORY	V	5	3	2	-	4

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	M	S	M	S
CO2	M	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	M	M	S	M	S
CO4	M	S	S	M	S	M	M	S	M	S
CO5	S	M	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr. P. Sakthivel	HOD – Mr. G. Selvakumar	Member Secretary Dr. S. Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME03	**MARKETING ANALYTICS**	**DSE THEORY**	**5**	**5**	**3**	**2**	**-**	**4**
Objective	Student can understand the concepts of Marketing Analytics, impart the knowledge on Demand.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Marketing Analytics**: Introduction to marketing research, Research design setup, Qualitative research, Quantitative research, Concept development, scale development, Exploring Data, Descriptive Statistics. Product analytics-features, attributes, benefits, Price analytics, Promotion analytics, Channel analytics, Multiple Discriminate analysis**.**	K1	13
II	**Customer Analytics:** Customer Analytics, Analyzing customer satisfaction, Prospecting and Targeting the Right Customers, Covariance and Correlation analysis, Developing Customers, Retaining Customers, Customer lifetime value case, Factor analysis. Market Segmentation & Cluster Analysis, Scatterplots & Correlation Analysis, Linear Regression, Model Validation & Assessment, Positioning analytics, Cross tabulation**.**	K2	12
III	**Social Media Analytics (SMA)**: Social media landscape, Need for SMA; SMA in Small organizations; SMA in large organizations; Application of SMA in different areas Network fundamentals and models: The social networks perspective - nodes, ties and influencers, Social network and web data and methods. Graphs and Matrices- Basic measures for individuals and networks. Information visualization.	K3	11
IV	**Facebook Analytics:** Introduction, parameters, demographics. Analyzing page audience. Reach and	K4	12

	Engagement analysis. Post- performance on FB. Social campaigns. Measuring and Analyzing social campaigns, defining goals and evaluating outcomes, Network Analysis. 9 (LinkedIn, Instagram, YouTube Twitter etc. Google analytics. Introduction. (Websites)		
V	**Web Analytics and making connections**: Link analysis. Random graphs and network evolution. Social contexts: Affiliation and identity. Web analytics tools: Clickstream analysis, A/B testing, online surveys, Web crawling and Indexing. **Current Trends: ***Marketing Planning and Analytics*.	K5	12
	…… Self Study……		
Course Outcome	**CO1:** Recall the analytical framework and tools used in marketing.	K1	
	CO2: Summarize information of firm internal and external marketing environment to identify the marketing strategies.	K2	
	CO3: Apply exercise critical judgment though new development in marketing environment.	K3	
	CO4: Categorize marketing functions and the role it plays for marketing success.	K4	
	CO5: Evaluate and act based on new marketing activities.	K5	
Learning Resources			

Text Books	1. Digital Marketing Analytics: Making Sense of Consumer Data in a Digital World, Chuck Hemann & Ken Burbary, Pearson, ISBN 9780789750303 2. Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die, Eric Siegel, Pearson 3. Marketing Analytics: Optimize Your Business with Data Science in R, Python, and SQL, Dave Jacobs. 4. Matthew Ganis, Avinash Kohirkar. Social Media Analytics: Techniques and Insights for Extracting Business Value Out of Social Media. Pearson 2016. 5. Jim Sterne. Social Media Metrics: How to Measure and Optimize Your Marketing Investment. Wiley, 2020. 6. Marshall Sponder. Social Media Analytics. McGraw Hill Latest edition			
Reference Books	1. Marketing Analytics: A practical guide to real marketing science, Mike Grigsby, Kogen Page, ISBN 9780749474171 2. Cutting Edge Marketing Analytics: Real World Cases and Data Sets for Hands on Learning, Raj Kumar Venkatesan, Paul Farris, Ronald T. Wilcox. 3. Marketing Metrices3e, Bendle, Farris, Pferfery, Reibstein			
Website Link	1.https://www.coursera.org/learn/uva-darden-market-analytics 2.https://www.wrike.com/marketing-guide/marketing-analytics			
Self-Study Material	1.https://www.ibm.com/products/planning-analytics/marketing-planning			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME03	**MARKETING ANALYTICS**	**DSE THEORY**	**5**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr. C. Suresh kumar	**HoD -Mr. G. Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME04	**DATA COMMUNICATION AND COMPUTER NETWORKS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Student can understand the basics of data communication, networking, internet and their importance and features of various protocol layers in data networks.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Data Communications:** Introduction– Networks – The Internet – Protocols and Standards- Network Models: OSI model – TCP/IP protocol suite – Transmission Media: Guided media – Unguided Media.	K1	12
II	**Data Link Layer:** Error Detection and Correction: Introduction- Block coding – Linear block codes – Cyclic Codes – Checksum. Framing – Flow and Error Control: Protocols –Noiseless Channels: Stop- and –Wait – Noisy Channel: Stop-and Wait Automatic Repeat Request-Go-B.	K2	12
III	**Medium Access and Network Layer:** Multiple Access: Random Access – Controlled access- Channelization. Network Layer Logical addressing: IPv4 addresses – IPv6 addresses. Transport Layer: Process to Process delivery: UDP – TCP. Congestion Control – Quality of Service.	K3	12
IV	**Application Layer:** Domain Naming System: Name Space - Domain Name Space - Distribution of Name Space - DNS in the INTERNET - Resolution–Remote logging – E-mail – FTP.	K4	12
V	**Wireless Networks:** Wireless Communications – Principles and Fundamentals. WLANs – WPAN- Satellite Networks - Ad-hoc Networks.***Current Trends:** 5G Networks*.	K5	12
	***……* Self Study.**		
Course Outcome	**CO1:** Recall the basics of data communication, networking, internet and their importance.	K1	
	CO2: Understand the services and features of various protocol layers in data networks.	K2	
	CO3: Apply wired and wireless computer networks.	K3	

	CO4: Analyze TCP/IP and their protocols.	K4
	CO5: Assess the different internet devices and their functions.	K5

Learning Resources				
Text Books	1. Forouzan, A. Behrouz. (2006), Data Communications & Networking, Fourth Edition, Tata McGraw Hill Education 2. Nicopolitidis, Petros, Mohammad SalamehObaidat, G. L. Papadimitriou(2018), Wireless Networks, John Wiley & Sons.			
Reference Books	1. Fred Halsall(1996), Data Communications Computer Networks and Open Systems, Fourth Edition, Addison Wesley.			
Website Link	1. https://www.tutorialspoint.com/data_communication_computer_network/index.htm 2. https://www.geeksforgeeks.org/data-communication-definition-components-types-channels/			
Self-Study Material	1.https://www.linkedin.com/pulse/computer-networks-emerging-trends-kisore-jack-4afic			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C- Credit**

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M5UAME04	**DATA COMMUNICATION AND COMPUTER NETWORKS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	M	L	M	S	L	M	L
CO2	M	L	M	L	S	M	L	M	L	S
CO3	S	M	L	L	L	S	M	L	L	L
CO4	S	S	S	M	L	S	S	S	M	L
CO5	M	S	L	M	S	M	S	L	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs.K.Gayathri	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME05	**BIG DATA ANALYTICS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand the fundamental concepts of big data analytics, explore tools and practices for working with Big data and Connect with Mongo DB SQL Database.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Big data Introduction :** Big Data introduction - definition and taxonomy - Big data value for the enterprise - The Hadoop ecosystem - Introduction to Distributed computing- Hadoop ecosystem – Hadoop Distributed File System (HDFS) Architecture - HDFS commands for loading/getting data - Accessing HDFS through Java program.	K1	12
II	**Map reduce :** Introduction to Map Reduce frame work - **Basic Map Reduce Programming:** Advanced Map Reduce programming: Basic template of the Map Reduce program, Word count problem- Streaming in Hadoop- Improving the performance using combiners- Chaining Map Reduce jobs- Joining data from different sources.	K2	12
III	**Pig and Hive:** Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - Fundamentals of HBase and ZooKeeper.	K3	12
IV	**Mongo DB :** No SQL databases: Mongo DB: Introduction – Features - Data types - Mongo DB Query language - CRUD operations – Arrays - Functions: Count – Sort – Limit – Skip – Aggregate - Map Reduce. Cursors – Indexes - Mongo Import – Mongo Export.	K4	12

V	**Cassandra:** Introduction – Features - Data types – CQLSH - Key spaces - CRUD operations – Collections – Counter – TTL - Alter commands - Import and Export - Querying System tables. **Current trends: *** Data Democratization*	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Recall the concepts of Big Data and its analytics in the real world.	K1	
	CO2: Summarize the Design of Algorithms to solve Data Intensive Problems using Map Reduce Paradigm.	K2	
	CO3: Apply the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analytics.	K3	
	CO4: Analyze the Implementation of Big Data Analytics using pig and spark to solve data intensive problems.	K4	
	CO5: Assess the Database connectivity with MongoDB.	K5	

Learning Resources	
Text Books	1. JSeema Acharya, Subhashini Chellappan, — Big Data and Analytics, Wiley Publication, 2015. 2. Ramesh Sharda, Dursun Delen, Efraim Turban (2018), Business Intelligence, Pearson Education Services Pvt Ltd.
Reference Books	1. Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman, — Big Data for Dummies, John Wiley & Sons, Inc., 2013. 2. Tom White, — Hadoop: The Definitive Guide, O"Reilly Publications, 2011. 3. Kyle Banker, — Mongo DB in Action, Manning Publications Company, 2012. 4. Russell Bradberry, Eric Blow, —Practical Cassandra A developers Approach —, Pearson Education, 2014.
Website Link	1.https://www.javatpoint.com/what-is-big-data
Self-Study Material	1.https://enterprise.spectrum.com/content/dam/spectrum/enterprise/en/pdfs/resources/e-books/SE-HC-EB008-Data-Democratization.pdf. 2. https://amplitude.com/blog/data-democratization.

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M5UAME05	**BIG DATA ANALYTICS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**	

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	S	S	S	S	S	M	S	S	S
CO2	S	M	M	S	S	S	S	S	S	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	S	S	S	M	S	M	M	S	S	S
CO5	M	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.K.Vijayakumar	**HoD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME06	**COMPUTER NETWORKS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand the Network hardware, Software, Layers and different network models to impart knowledge on Design Issues of Data Link Layer and IP Addresses, and Routing algorithms.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction of Networks:** Uses of Computer Networks – Network Hardware - Network Software - OSI Reference Model – TCP/IP Reference Model.	K1	12
II	**Physical Layer:** Introduction – Guided Transmission media – Wireless Transmission – Public Switched Telephone Network – Local Loop – Trunks – Multiplexing - Switching.	K2	12
III	**Data Link Layer:** Introduction – Design Issues - Error Detection and Correction - Simplex Stop and Wait Protocol - Sliding Window Protocol.	K3	12
IV	**Network Layer:** Introduction – Design Issues – Routing Algorithm- IP Protocol – IP Addresses-Internet Control Protocols.	K4	12
V	**Transport Layer:** Addressing- Connection Establishment Connection Release. **Internet Transport Protocol:** UDP-TCP. **Application Layer:** DNS- Electronic Mail-World Wide Web. **Current trends: * Dynamic source routing in ad hoc wireless networks***	K4	12
	…… Self Study.		
Course Outcome	**CO1:** Recall the functions of each layer in OSI and TCP/IP model.	K1	
	CO2: Demonstrate Basics of Physical layer and apply them in real time applications.	K2	

	CO3: Identify errors and correction and Flow control using protocols.	K3	
	CO4: Examine the Network layers and Generate IP address to find out the route through Routing algorithms.	K4	
	CO5: Inspect the Design of transport layer Protocols needed for End–End delivery of packets.	K4	

Learning Resources				
Text Books	A. S. Tanenbaum, —Computer Networks‖, Prentice-Hall of India 2008, 4th Edition.			
Reference Books	1. Stallings, —Data and Computer Communications, Pearson Education 2012, 7th Edition. 2. B. A. Forouzan, —Data Communications and Networking, Tata McGraw Hill 2007, 4th Edition. 3. F. Halsall, —Data Communications, Computer Networks and Open Systems, Pearson Education 2008. 4. D. Bertsekas and R. Gallagher, —Data Networks, PHI 2008, 2nd Edition. 5. Lamarca, —Communication Networks, Tata McGraw Hill 2002.			
Website Link	https://www.javatpoint.com/computer-network-tutorial			
Self-Study Material	1. https://www.researchgate.net/publication/2802692_Dynamic_Source_Routing_in_Ad_Hoc_Wireless_Networks 2. https://www.slideshare.net/slideshow/dynamic-source-routing-in-ad-hoc-wireless-networks/92419112#7			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M5UAME06	**COMPUTER NETWORKS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**	

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	S	S	S	S	S	M	S	S	S
CO2	S	M	M	S	S	S	S	S	S	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	S	S	S	M	S	M	M	S	S	S
CO5	M	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.K.Vijayakumar	**HoD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME07	**CRYPTOGRAPHY**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**

Objective	Students can understand the fundamentals of Cryptography, acquire knowledge algorithms used confidentiality, integrity and authenticity, design security applications in the field of Information technology.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** The OSI security Architecture – Security Attacks – Security Mechanisms – Security Services – A model for network Security.	K1	12
II	**Classical Encryption Techniques:** Symmetric cipher model – **Substitution Techniques:** Caesar Cipher – Mono alphabetic cipher – Play fair cipher – Poly Alphabetic Cipher – Transposition techniques – Stenography	K2	12
III	**Block Cipher and DES:** Block Cipher Principles – DES – The Strength of DES –**RSA:** The RSA algorithm.	K3	12
IV	**Network Security Practices**: IP Security overview - IP Security architecture – Authentication Header. **Web Security**: Secure Socket Layer and Transport Layer Security – Secure Electronic Transaction.	K4	12
V	Intruders – Malicious software – Firewalls. **Current Trends:***Future of cyber security*	K5	12
	***……* Self Study.**		
Course Outcome	**CO1**: Recite the vulnerabilities in any computing system and hence be able to design a security solution.	K1	
	CO2: Understand the different cryptographic operations of symmetric cryptographic algorithms	K2	

	CO3: Apply the different cryptographic operations of public key cryptography	K3	
	CO4: Analyze the various Authentication schemes to simulate different applications.	K4	
	CO5: Compare the various Security practices and System security standards.	K5	

Learning Resources				
Text Books	William Stallings**,** —Cryptography and Network Security Principles and Practices.			
Reference Books	1**.** Behrouz A. Foruzan —Cryptography and Network Security, Tata McGraw-Hill, 2007. 2. AtulKahate —Cryptography and Network Security, Second Edition, 2003,TMH. 3. M.V. Arun Kumar—Network Security, 2011, First Edition, USP.			
Website Link	1.https://www.tutorialspoint.com/cryptography/ 2 https://gpgtools.tenderapp.com/kb/how-to/introduction-to-cryptography/			
Self-Study Material	1. https://fieldeffect.com/blog/what-is-the-future-of-cyber-security			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M5UAME07	**CRYPTOGRAPHY**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	S	S	S	S	S
CO2	L	M	L	S	M	S	M	S	S	S
CO3	M	S	S	M	S	S	S	M	S	S
CO4	S	M	M	S	S	S	S	S	S	S
CO5	S	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs. R. Suguna	**HOD – Mr.G.Selvakumar**	**Member Secretary Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME08	**OPERATING SYSTEM**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand the fundamental concepts and role of Operating System, Process Management and Scheduling Algorithms, I/O and File management techniques, Analyze resource management techniques.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**- views and goals – Operating System Services - User and Operating System interface - System Call- Types of System Calls – Operating System Design and Implementation - Operating System Structure. **Process Management**: Process concept- Process Scheduling - Operations on Processes- Inter process Communication. **Threads**: Types of threads	K1	12
II	**Process Scheduling**: Basic Concepts-Scheduling Criteria Scheduling Algorithm Multiple Processor Scheduling CPU Scheduling. **Synchronization**: The Critical-Section Problem Synchronization Hardware – Semaphores- Classic Problem of Synchronization.	K2	12
III	**Deadlocks:** Deadlock Characterization - Methods for Handling Deadlocks-Deadlock Prevention- Deadlock Avoidance - Deadlock Detection- Recovery from Deadlock.	K3	12
IV	**Memory**-Management Strategies: Swapping - Contiguous Memory Allocation Segmentation- Paging - Structure of the Page Table. **Virtual-Memory Management**: Demand Paging - Page Replacement - Allocation of Frames -Thrashing.	K4	12

V	**Storage Management:** File System- File Concept - Access Methods- Directory and Disk Structure -File Sharing- Protection. Allocation Methods - Free- Space Management - Efficiency and Performance – Recovery. **Current Trends:*** Different And Latest Trends In Operating System ***.**	K5	12
	***……* Self Study.**		
Course Outcome	**CO1:** Define OS with its view and goals and services rented by it structure. Message through Inter process communication.	K1	
	CO2: Demonstrate the process through scheduling algorithms. Prevention of multiple process executing through the concept of semaphores.	K2	
	CO3: Apply the Mutual exclusion, Deadlock detection and agreement protocols for dead lock prevention and its avoidance.	K3	
	CO4: Analyze the strategies of Memory management schemes and the usage of Virtual memory.	K4	
	CO5: Assess storage management.	K5	

Learning Resources	
Text Books	1.A. SilberschatzP.B.Galvin, Gange. —Operating System Concepts, Ninth Edition, 2013, Addison WesleyPublishing Co..
Reference Books	1.Anderw S Tanenbaum, Albert S. Woodhull, Operating System Design and Impletation, prentice-Hall India Publication.

	2. William Stallings, —Operating Systems Internals and Design Principles‖, Pearson, 2018, 9th Edition. 3. Elmasri, Carrick, Levine -Operating Systems: A Spiral Approach , TMH Edition 4. James L. Peterson, Abraham Silberschatz, Addison – Wesley- Operating System Concepts (2nd Ed). 5. Andrew S. Tanenbam, Albert S. Woodhull Pearson-Operating Systems Design & implementation.			
Website Link	1. https://www.guru99.com/operating-system-tutorial.html 2.https://www.mygreatlearning.com/blog/what 3.https://en.wikipedia.org/wiki/Operating_system 4.https://www.geeksforgeeks.org/what-is-an-operating-system/			
Self-Study Material	1.https://www.essaycorp.com/blog/latest-trends-in-operating-systems			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M5UAME08	OPERATING SYSTEM	DSE THEORY	V	5	3	2	-	4

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	S	S	S	M	S
CO2	L	M	L	S	M	S	M	S	M	S
CO3	M	S	S	M	S	S	S	S	M	S
CO4	S	M	M	S	S	S	S	S	S	M
CO5	S	S	M	M	M	S	S	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs. R. Suguna	HOD – Mr.G.Selvakumar	Member Secretary-Dr.S.Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME09	**ARTIFICIAL NEURAL NETWORKS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Student can learn basics of artificial neural networks, learning process, single layer and multi-layer perceptron networks.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Artificial Neural Model**- Activation functions- Feed forward and Feedback, Convex Sets, Convex Hull and Linear Separability, Non-Linear Separable Problem - Multilayer Networks. Learning Algorithms- Error correction - Gradient Descent Rules, Perceptron Learning Algorithm, Perceptron Convergence Theorem.	K1	10
II	**Introduction**, Error correction learning, Memory-based learning, Hebbian learning, Competitive learning, Boltzmann learning, credit assignment problem, Learning with and without teacher, learning tasks, Memory and Adaptation	K2	12
III	**Single layer Perception:** Introduction, Pattern Recognition, Linear classifier, Simple perception, Perception learning algorithm, Modified Perception learning algorithm, Adaptive linear combiner, Continuous perception, learning in continuous perception, Limitation of Perception.	K3	13
IV	**Multi-Layer Perceptron Networks:** Introduction, MLP with 2 hidden layers, Simple layer of a MLP, Delta learning rule of the output layer, Multilayer feed forward neural network with continuous perceptions, Generalized delta learning rule, Back propagation algorithm	K4	12
V	**Deep learning**- Introduction- Neuro architectures building blocks for the DL techniques, Deep Learning and Neo cognitron, Deep Convolutional Neural Networks, Recurrent Neural Networks (RNN), feature extraction, Deep Belief Networks, Restricted Boltzmann Machines, Training of DNN and Applications. **Current Trends**: *Graph neural network.*	K5	13

Course Outcome	**CO1:** Recall the basics of artificial neural networks and its architecture.	K1	
	CO2: Understand the various learning algorithms and their applications.	K2	
	CO3: Identify the appropriate neural network model to a particular application	K3	
	CO4: Examine the selected neural network model to a particular application	K4	
	CO5: Evaluate the performance of the selected neural network.	K5	

Learning Resources				
Text Books	1. Satish Kumar- Neural Networks a Classroom Approach-, McGraw Hill- Second Edition. 2. - Simon Haykins, Pearson -Neural Network- A Comprehensive Foundation Prentice Hall, 2nd Edition, 1999.			
Reference Books	1. B. Yegnanarayana -Artificial Neural Networks-, PHI, New Delhi 1998.			
Website Link	1.https://www.tutorialspoint.com/artificial_neural_network/index.htm 2.https://www.javatpoint.com/artificial-neural-network			
Self-Study Material	1. https://www.assemblyai.com/blog/ai-trends-graph-neural-networks			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAME09	**ARTIFICIAL NEURAL NETWORKS**	**DSE THEORY**	**V**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr. C. Suresh Kumar	**HOD – Mr. G. Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME10	**SOFTWARE ENGINEERING**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand engineering concepts and to create a system model in real life applications.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**: The software engineering discipline, programs vs. software products, why study software engineering, emergence of software engineering, Notable changes in software development practices, computer systems engineering.	K1	12
II	**Requirements Analysis and Specification**: Requirements gathering and analysis, Software requirements specification (SRS)Software Design: Good software design, cohesion and coupling, neat arrangement, software design approaches, object- oriented vs function-oriented design	K2	12
III	**Function-Oriented Software Design**: Overview of SA/SD methodology, structured analysis, data flow diagrams (DFD's), structured design, detailed design.	K3	12
IV	**Coding and Testing**: Coding; code review; testing; testing in the large vs testing in the small; unit testing; black-box testing; white-box testing; debugging; program analysis tools; integration testing; system testing; some general issues associated with testing.	K4	12
V	**Software Maintenance**: Characteristic of software maintenance; software reverse engineering; software maintenance process models; estimation of maintenance cost.**Current Trends:** * Block chain: More Security in Software Development ***.**	K5	12

	…. **Self Study**		
Course Outcome	**CO1:** Recite basic knowledge of analysis and design of systems	K1	
	CO2: Understand software engineering principles and techniques.	K2	
	CO3: Develop a reliable and cost-effective software system	K3	
	CO4: Discover an effective model of the system	K4	
	CO5: Evaluate testing at various levels and produce an efficient system.	K5	

Learning Resources				
Text Books	1. Rajib Mall, Fundamentals of Software Engineering, Fifth Edition, Prentice-Hall of India, 2018.			
Reference Books	1. Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill publishing company Ltd, Edition 1997. 2. Roger S. Pressman, Software Engineering, Seventh Edition, McGraw-Hill. 3. James A. Senn, Analysis & Design of Information Systems, Second Edition, McGraw-Hill International Editions			
Website Link	1. https://www.geeksforgeeks.org/software-development-life-cycle-sdlc/ 2. https://www.geeksforgeeks.org/software-engineering-cocomo-model/ 3. https://www.javatpoint.com/software-engineering-coding			
Self-Study Material	https://www.geeksforgeeks.org/what-is-blockchain-security/			
	L-Lecture	T-Tutorial	P-Practical	C- Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME10	**SOFTWARE ENGINEERING**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	M	S
CO2	S	S	S	S	S	M	M	S	M	S
CO3	S	S	S	S	S	S	S	S	M	S
CO4	S	S	S	S	S	M	S	S	S	M
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	**Verified By**	**Approved By**
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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME11	**SOFTWARE QUALITY ASSURANCE**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand the importance of standards in the quality management process and their impact on the final product.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**- quality and the quality system – standards and procedures technical activities. Software tasks –management responsibility – quality system – contract review – design control – document control – purchasing product identification and traceability.	K1	12
II	**Process control**–checking– identification of testing tools– control of non-conforming product –corrective action.	K2	12
III	**Handling, storage, packing and delivery** –quality records-internal quality audits –training –servicing –statistical techniques.	K3	12
IV	**QA and new technologies** –QA and Human–computer interface process modeling–standards and procedures.	K4	12
V	**ISO** -9001-Elements of ISO 9001-improving quality system – Case study **Current Trends:** * AI Augmentation*	K5	12
	…. **Self Study**		
Course Outcome	**CO1:** State the role of Quality Assurance in Software Engineering.	K1	
	CO2: Illustrate the role of automation in software quality assurance and gain practical experience in using automated testing tools.	K2	

	CO3: Apply the concepts in preparing the quality plan & documents.	K3	
	CO4: Analyze and executing software test plans, test cases, and test scripts.	K4	
	CO5: Evaluate information quality, software quality and business value of information system.	K5	

Learning Resources				
Text Books	1. Darrel Ince —An introduction to software quality assurance and its implementation, MGH 1994. 2. Darrel Ince —ISO 9001 software quality assurance, MGH 1999.			
Reference Books	1. Alan C. Gillies, —Software Quality: Theory and Management, International Thomson Computer Press, 1997. 2. Mordechai Ben-Menachem —Software Quality: Producing Practical Consistent Software, International Thompson Computer Press, 1997			
Website Link	1. https://www.geeksforgeeks.org/software-engineering-software-quality-assurance/ 2.https://www.javatpoint.com/software-quality-assurance			
Self-Study Material	https://www.bmc.com/blogs/ai-human-augmentation/			
	L-Lecture	T-Tutorial	P-Practical	C- Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME11	**SOFTWARE QUALITY ASSURANCE**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	M	S
CO2	S	S	S	S	S	M	M	S	M	S
CO3	S	S	S	S	S	S	S	S	M	S
CO4	S	S	S	S	S	M	S	S	S	M
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	**Verified By**	**Approved By**
Mrs.N.Padmapriya	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME12	**SOFTWARE PROJECT MANAGEMENT**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**5**
Objective	Students can understand the software project management metrics and strategy in effectively managing projects and apply the software testing techniques in the commercial environment.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction of Software Development Process:** Introduction to Competencies - Product Development Techniques Management Skills - Product Development Life Cycle – Software Development Process and models-The SEICMM International Organization for Standardization.	K1	12
II	**Project plan:** Managing Domain Processes - Project Selection Models – Project Portfolio Management- Financial Processes- Selecting a Project Team - Goal and Scope of the Software Project -Project Planning -Creating the Work Breakdown Structure - Approaches to Building a WBS-Project Milestones-Work Packages-Building a WBS for Software.	K2	12
III	Tasks and Activities - Software Size and Reuse Estimating – The SEICMM-Problems and Risks-Cost Estimation. **Effort Measures COCOMO:** A Regression Model. **COCOMOII SLIM:** A Mathematical Model-Organizational Planning-Project Roles and Skills Needed.	K3	12
IV	**Project Management Resource Activities:** Organizational Form and Structure - Software Development Dependencies - Brainstorming -Scheduling Fundamentals – PERT and CPM –	K4	12

	Levelling Resource Assignments-Map the Schedule to a Real Calendar- Critical Chain Scheduling.		
V	**Quality:** Requirements – The SEI CMM - Guidelines - Challenges Quality Function Deployment-Building the Software Quality Assurance – Plan. **Software Configuration Management:** Principles Requirements-Planning and Organizing-Tools-Benefits-Legal Issues in Software-Case Study. **Current Trends- ***Block chain in Project Management*****	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Remember the basic Principles and Concepts of Project management.	K1	
	CO2: Understand the concept of Software Development Process and models.	K2	
	CO3:Apply the Software project management Methodologies.	K3	
	CO4: Analyze the Comprehensive Project plans.	K4	
	CO5: Agree the mitigate risks associated with the Software development process.	K5	

Learning Resources	
Text Book	1.RobertT.Futrell, DonaldF.Shafer, LindaI.Safer, Quality Software Project Management, Pearson Education Asia 2002.
Reference Books	1. PankajJalote, Software Project Management in Practice, Addison Wesley 2002. 2. Hughes, Software Project Management, TataMcGraw Hill 2004,3rd Edition.
Website Link	www.smartworld.com/notes/software-project-management
Self-Study Material	https://blockchain.oodles.io/blog/blockchain-in-project-management/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME12	**SOFTWARE PROJECT MANAGEMENT**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**5**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	M	S	M	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	S	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.V.VENGADESH	**HoD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME13	**SOFTWARE METRICS**	**DSC THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students can Understand the essential concepts of measurement and software metrics, and to apply suitable analytical methods to interpret software metrics data and extract valuable insights.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Fundamentals of Measurement:** Need for Measurement: Measurement in Software Engineering, Scope of Software Metrics, The Basics of measurement: The representational theory of measurement, Measurement and models, Measurement scales and scale types, meaningfulness in measurement.	K1	12
II	**A Goal-Based Framework For Software Measurement:** Classifying software measures, Determining what to Measure, Applying the framework, Software measurement validation, Performing Software Measurement Validation. **Empirical investigation:** Principles of Empirical Studies, Planning Experiments, Planning case studies as quasi-experiments, Relevant and Meaningful Studies.	K2	12
III	**Software Metrics Data Collection:** Defining good data, Data collection for incident reports, How to collect data, Reliability of data collection Procedures. **Analyzing software measurement data:** Statistical distributions and hypothesis testing, Classical data analysis techniques, Examples of simple analysis techniques.	K3	12
IV	**Measuring internal product attributes:** Size Properties of Software Size, Code size, Design size, Requirements analysis and Specification size, Functional size measures and estimators, Applications of size measures. **Measuring internal product attributes:** Structure: Aspects of Structural Measures, Control flow	K4	12

	structure of program units, Design level Attributes, Object-oriented Structural attributes and measures.		
V	**Measuring External Product Attributes:** Modelling software quality, Measuring aspects of quality, Usability Measures, Maintainability measures, Security Measures. **Software Reliability:** Measurement and Prediction: Basics of reliability theory, The software reliability problem, Parametric reliability growth models, Predictive accuracy**.*Current Trends - Agile process metrics – Test Metrics*.**	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Remember the various fundamentals of measurement and software metrics	K1	
	CO2: Understand frame work and analysis techniques for software measurement	K2	
	CO3: Apply internal and external attributes of software product for effort estimation	K3	
	CO4: Analyze appropriate analytical techniques to interpret software metrics data and derive meaningful insights	K4	
	CO5: Influence the reliability models for predicting software quality	K5	

Learning Resources

Text Books	1. Norman Fenton, James Bieman ,Software Metrics A Rigorous and Practical Approach, Third Edition, 2014
Reference Books	1.Norman E, Fenton and Shari Lawrence Pfleeger ,Software metrics, , International Thomson Computer Press, 1997 2. Stephen H.Kan ,Metric and models in software quality engineering, , Second edition, 2002, Addison Wesley Professional
Website Link	1. https://lansa.com/blog/general/what-are-software-metrics-how-can-i-measure-thesemetrics/ 2. https://stackify.com/track-software-metrics/
Self-Study Material	1. https://www.sealights.io/software-development-metrics/top-5-software-metrics-to-manage-development-projects-effectively/ 2. https://link.springer.com/book/10.1007/978-3-540-68255-4

	L-Lecture	T-Tutorial	P-Practical	C- Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M6UAME13	**SOFTWARE METRICS**	**DSC THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**	

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	L	S	S	S	S	L
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	**Verified By**	**Approved By**
Mr.V.Vengadesh	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME14	**ORGANIZATIONAL BEHAVIOUR**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Student able to to learn the knowledge on scope of OB to create the awareness of individual behaviour and enhance the understanding of group behaviour.							

Unit	Course Content	Knowledge Levels	Sessions
I	**INTRODUCTION :** Concept of Organizational Behaviour (OB): Nature, Scope and Role of OB: Disciplines that contribute to OB; Opportunities for OB (Globalization, Indian workforce diversity, customer service, innovation and change, networked organizations, work-life balance, people skills, positive work environment, ethics)	K1	12
II	**INDIVIDUAL BEHAVIOUR:** 1. Learning, attitude and Job satisfaction: Concept of learning, conditioning, shaping and reinforcement. Concept of attitude, components, behaviour and attitude. Job satisfaction: causation; impact of satisfied employees on workplace. 2. Motivation: Concept; Theories (Hierarchy of needs, X and Y, Two factor, McClelland, Goal setting, Self-efficacy, Equity theory); Job characteristics model; Redesigning jobs, 3. Personality and Values: Concept of personality; Myers Briggs Type Indicator (MBTI); Big Five model. Relevance of values; Linking personality and values to the workplace (person-job fit, person-organization fit) 4. Perception, Decision Making: Perception and Judgement Factors; Linking perception to individual decision making.	K2	12

III	**GROUP BEHAVIOUR :** 1. Groups and Work Teams : Concept : Five Stage model of group development; Group norms, cohesiveness ; Group think and shift ; Teams; types of teams; Creating team players from individuals and team based work(TBW) 2. Leadership: Concept, Trait theories, Behavioural theories (Ohio and Michigan studies)- Contingency theories (Fiedler, Hersey and Blanchard, Path Goal).	K3	12
IV	**ORGANISATIONAL CULTURE AND STRUCTURE :** Concept of culture; Impact(functions and liability);Creating and sustaining culture: Concept of structure, Prevalent organizational designs: New design options	K4	12
V	ORGANISATIONAL CHANGE, CONFLICT AND POWER: Forces of change; Planned change; Resistance; Approaches (Lewin's model, Organisational development). Concept of conflict, Conflict process; Types, Functional/ Dysfunctional. Introduction to power and politics. **Current Trends- *organizational behaviour trends and decision making***	K5	12
	***……* Self Study.**		
Course Outcome	**CO1**:Define Organizational Behavior, Understand the opportunity through OB.	K1	
	CO2: Show self-awareness, motivation, leadership and learning theories at workplace.	K2	
	CO3: Identify the complexities and solutions of group behavior.	K3	
	CO4: Analyze bring positive change in the culture of the organization.	K4	
	CO5: Assess a congenial climate in the organization.	K5	
Learning Resources			
	1. NeharikaVohra Stephen P. Robbins, Timothy A. Judge, Organizational		

Text Books	Behaviour, Pearson Education, 18th Edition, 2022. 2. Fred Luthans, Organizational Behaviour, Tata McGraw Hill, 2017. 3. Ray French, Charlotte Rayner, Gary Rees & Sally Rumbles, Organizational Behaviour, John Wiley & Sons, 2011 4. Louis Bevoc, Allison Shearsett, Rachael Collinson, Organizational Behaviour Reference, Nutri Niche System LLC (28 April 2017) 5. Dr.Christopher P. Neck, Jeffery D. Houghton and Emma L. Murray, Organizational Behaviour: A Skill-Building Approach, SAGE Publications Inc, 2nd edition (29 November 2018).
Reference Books	1. Uma Sekaran, "Organizational Behaviour Text & cases", 2nd edition, Tata McGraw Hill Publishing CO. Ltd 2. GangadharRao, Narayana, V.S.P Rao, "Organizational Behaviour 1987", Reprint 2000, Konark Publishers Pvt. Ltd, 1st edition 3. S.S. Khanka," Organizational Behaviour", S. Chand & Co, New Delhi 4. J. Jayasankar, "Organizational Behaviour", Margham Publications, Chennai, 2017 5. John Newstrom, "Organizational Behaviour", HumaBehaviour at Work, McGraw Hill Education; 12th edition (1 July 2017)
Website Link	https://www.iedunote.com/organizational-behavior
Self-Study Material	https://www.researchgate.net/profile/C-K-Gomathy/publication/371838511_ORGANIZATIONAL_BEHAVIOUR_TRENDS_AND_DECIS ION-MAKING/links/64ae2fcac41fb852dd6aea4b/ORGANIZATIONAL-BEHAVIOUR-TRENDS-AND-DECISION-MAKING.pdf

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME14	**ORGANIZATIONAL BEHAVIOUR**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PS04	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	M	M	M	S	M	S	M	M	M
CO3	M	S	M	S	S	S	S	S	S	S
CO4	M	M	S	M	S	M	M	M	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME15	**AGILE PROJECT MANAGEMENT**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand the software design and a set of software technologies and APIs.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**: Modernizing Project Management: Project Management Needed a Makeover – Introducing Agile Project Management. Applying the Agile Manifesto and Principles: Understanding the Agile manifesto – Outlining the four values of the Agile manifesto – Defining the 12 Agile Principles – Adding the Platinum Principles – Changes as a result of Agile Values – The Agile litmus test. **Why Being Agile Works Better:** Evaluating Agile benefits – How Agile approaches beat historical approaches – Why people like being Agile.	K1	13
II	**Being Agile: Agile Approaches:** Diving under the umbrella of Agile approaches – Reviewing the Big Three: Lean, Scrum, Extreme Programming - Summary **Agile Environments in Action:** Creating the physical environment – Low-tech communicating – High-tech communicating – Choosing tools. **Agile Behaviours in Action:** Establishing Agile roles – Establishing new values – Changing team philosophy.	K2	12
III	**Agile Planning and Execution** Defining the Product Vision and Roadmap: Agile planning – Defining the product vision – Creating a product roadmap – Completing the product backlog. Planning Releases and Sprints: Refining requirements and estimates – Release planning – Sprint planning. Working Throughout the Day: Planning your day –		

	Tracking progress – Agile roles in the sprint – Creating shippable functionality – The end of the day. Showcasing Work, Inspecting and Adapting: The sprint review – The sprint retrospective. Preparing for Release: Preparing the product for deployment (the release sprint) – Preparing the operational support – Preparing the organization for product deployment - Preparing the marketplace for product deployment	K3	11
IV	**Agile Management:** Managing Scope and Procurement: What's different about Agile scope management – Managing Agile scope – What's different about Agile procurement – Managing Agile procurement. Managing Time and Cost: What's different about Agile time management – Managing Agile schedules – What's different about Agile cost management – Managing Agile budgets. Managing Team Dynamics and Communication: What's different about Agile team dynamics – Managing Agile team dynamics – What's different about Agile communication – Managing Agile communication. Managing Quality and Risk: What's different about Agile quality – Managing Agile quality – What's different about Agile risk management – Managing Agile risk.	K4	12
V	**Implementing Agile Building a Foundation**: Organizational and individual commitment – Choosing the right pilot team members – Creating an environment that enables Agility – Support Agility initially and over time. Being a Change Agent: Becoming Agile requires change – why change doesn't happen on its own – Platinum Edge's Change Roadmap – Avoiding pitfalls – Signs your changes are slipping. Benefits, Factors for Success and Metrics: Ten key benefits of Agile project management – Ten key factors for project success – Ten metrics for Agile Organizations. **Current Trends**: *Top 6 methods for agile Transformation*.	K5	12

	…… Self Study……		
Course Outcome	**CO1:** Recall the Agile manifesto and its advantages over other SDLC paradigms	K1	
	CO2: Understanding essential Agile concepts.	K2	
	CO3: Build, plan and execute a project using Agile concepts.	K3	
	CO4: Analyze Agile management concepts.	K4	
	CO5: Evaluate Practical application of Agile principles	K5	

Learning Resources				
Text Books	1. Mark C. Layton, Steven J. Ostermiller, *Agile Project Management for Dummies*, 2 nd Edition, Wiley India Pvt. Ltd., 2018. 2. Jeff Sutherland, Scrum – The Art of Doing Twice the Work in Half the Time, Penguin, 2014.			
Reference Books	1. Mark C. Layton, David Morrow, *Scrum for Dummies*, 2nd Edition, Wiley India Pvt. Ltd., 2018. 2. Mike Cohn, Succeeding with Agile – Software Development using Scrum, Addison-Wesley Signature Series, 2010. 3. Alex Moore, Agile Project Management, 2020.			
Website Link	1. www.agilealliance.org/resources			
Self-Study Material	https://www.knowledgehut.com/blog/agile/top-agile-trends			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME15	**AGILE PROJECT MANAGEMENT**	**DSE THEORY**	**5**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr. C. Suresh kumar	**HoD -Mr. G. Selvakumar**	**Member Secretary – Dr.S.Shahitha**

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME16	**COMPUTING INTELLIGENCE**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students able to learn the fundamental concepts in Computing Intelligence and apply basic principles of Artificial Intelligence and solutions that require problem solving, influence, perception, knowledge representation and learning.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to AI:** Problem formulation – AI Applications – Problems – State Space and Search – Production Systems – Breadth First and Depth First – Travelling Salesman Problem- Heuristic search techniques: Generate and Test – Types of Hill Climbing.	K1	11
II	**Fuzzy Logic Systems:** Notion of fuzziness – Operations on fuzzy sets – T-norms and other aggregation operators – Basics of Approximate Reasoning – Compositional Rule of Inference – Fuzzy Rule Based Systems – Schemes of Fuzzification – Inferencing – Defuzzification – Fuzzy Clustering – fuzzy rule-based classifier.	K2	12
III	**Neural Networks:** What is Neural Network, Learning rules and various activation functions, Single layer Perceptions, Back Propagation networks, Architecture of Back propagation (BP) Networks, Back propagation Learning, Variation of Standard Back propagation Neural Network, Introduction to Associative Memory, Adaptive Resonance theory and Self Organizing Map, Recent Applications.	K3	13

IV	**Artificial Neural Networks:** Fundamental Concepts – Basic Models of Artificial Neural Networks – Important Terminologies of ANNs – McCulloch-Pitts Neuron – Linear Separability – Hebb Network.	K4	12
V	**Genetic Algorithm:** Introduction – Biological Background – Genetic Algorithm Vs Traditional Algorithm – Basic Terminologies in Genetic Algorithm – Simple GA – General Genetic Algorithm – Operators in Genetic Algorithm. **Current Trends:* Intelligent and Smart Enabling Technologies*.**	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Define the fundamentals of artificial intelligence concepts and searching techniques.	K1	
	CO2: Illustrate the fuzzy logic sets and membership function and defuzzification techniques.	K2	
	CO3: Apply the concepts of Neural Network and analyse and apply the learning techniques.	K3	
	CO4: Analyze the artificial neural networks and its applications.	K4	
	CO5: Interpret the concept of Genetic Algorithm and analyse the optimization problems using GAs.	K5	
Learning Resources			
Text Books	1. S.N. Sivanandam and S.N. Deepa, —Principles of Soft Computing‖, 2nd Edition, Wiley India Pvt. Ltd. 2. Stuart Russell and Peter Norvig, —Artificial Intelligence - A Modern Approach‖, 2nd Edition, Pearson Education in Asia.		

	3. S. Rajasekaran, G. A. Vijayalakshmi, —Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications, PHI.			
Reference Books	1. F. Martin, Mc neill, and Ellen Thro, —Fuzzy Logic: A Practical approach‖, AP Professional, 2000. Chin Teng Lin, C. S. George Lee, Neuro-Fuzzy Systems‖, PHI. 2. Chin Teng Lin, C. S. George Lee, Neuro-Fuzzy Systems‖, PHI.			
Website Link	https://www.javatpoint.com/artificial-intelligence-ai https://people.engr.tamu.edu/guni/csce421/files/AI_Russell_Norvig.pdf			
Self-Study Material	https://www.sciencedirect.com/topics/computer-science/intelligent-computing https://www.tutorialspoint.com/artificial_intelligence/index.html			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M6UAME16	COMPUTING INTELLIGENCE	DSE THEORY	VI	5	3	2	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mr. P. Sakthivel	HOD – Mr. G. Selvakumar	Member Secretary- Dr. S. Shahitha

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME17	**INFORMATION SECURITY**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students can understand the importance and application of each of confidentiality, integrity, authentication and availability, cryptographic algorithms, basic categories of threats to computers and networks.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Information Security :** Security mindset, Computer Security Concepts (CIA), Attacks, Vulnerabilities and protections, Security Goals, Security Services, Threats, Attacks, Assets, malware, program analysis and mechanisms.	K1	12
II	**The Security Problem in Computing:** The meaning of computer Security, Computer Criminals, Methods of Defense. Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption	K2	12
III	**Symmetric and Asymmetric Cryptographic Techniques:** DES, AES, RSA algorithms .Authentication and Digital Signatures: Use of Cryptography for authentication, Secure Hash function, Key management – Kerberos.	K3	10
IV	**Program Security:** Non-malicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-ofuse Errors, Viruses, Trapdoors, Salami attack, Man-in-the-middle attacks, and Covert channels. File protection Mechanisms, User Authentication Designing Trusted O.S: Security polices, models of security, trusted O.S design, Assurance in trusted O.S. Implementation examples.	K4	13

V	**Security in Networks:** Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, 15 Honeypots, Traffic flow security. Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction.**Current Trends:** *The Evolving Landscape of Digital Threats***.**	K5	13
	…… Self Study.		
Course Outcome	**CO1:** Recall the network security threats, security services, and countermeasures	K1	
	CO2: Understand vulnerability analysis of network security	K2	
	CO3: Apply the background on hash functions; authentication; firewalls; intrusion detection techniques.	K3	
	CO4: Analyze the programming and simulation techniques for security protocols.	K4	
	CO5: Interpret the methods for authentication, access control, intrusion detection and prevention.	K5	

Learning Resources				
Text Books	1. Charles P. Pfleeger - Security in Computing, Fourth Edition, by , Pearson Education 2.William Stallings, Pearson- Cryptography and Network Security Principles and Practice, Fourth or Fifth Edition, .			
Reference Books	1.C K Shyamala, N Harini, Dr T R Padmanabhan,Wiley- Cryptography and Network Security: , India, 1st Edition. 2. Forouzan Mukhopadhyay-,Cryptography and Network Security : Mc Graw Hill, 2"d Edition 3. Mark Stamp, Wiley-Information Security, Principles and Practice: India.			
Website Link	https://books.google.co.in/books/about/Security_in_Computing.html?id=O3VB-zspJo4C&redir_esc=y https://almuhammadi.com/sultan/books_2020/Forouzan.pdf			
Self-Study Material	https://www.simplilearn.com/resources/cyber-security/ebooks https://www.simplilearn.com/top-cybersecurity-trends-article			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME17	**INFORMATION SECURITY**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	M	M	S	M	S
CO4	M	S	S	M	S	M	M	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation
Teaching and Learning Methods	Audio, Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mr.P. Sakthivel	**HOD – Mr.G. Selvakumar**	**Member Secretary Dr.S. Shahitha**

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAME18	**GRID COMPUTING**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students able to learn the basic of Grid computing, recognize the various tool kits and frameworks available within the field.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Early Grid Activity, Current Grid Activity, Overview of Grid Business areas, Grid Applications, Grid Infrastructures.	K1	12
II	**Grid Computing organization and their Roles:** Organizations Developing Grid Standards, and Best Practice Guidelines, Global Grid Forum (GCF), #Organization Developing Grid Computing Tool kits and Framework #, Organization and building and using grid based solutions to solve computing, commercial organization building and Grid Based solutions.	K2	12
III	**Grid Computing Anatomy:** The Grid Problem, The conceptual of virtual organizations, # Grid Architecture # and relationship to other distributed technology.	K3	12
IV	**The Grid Computing Road Map:** Autonomic computing, Business on demand and infrastructure virtualization, Service-Oriented Architecture and Grid,# Semantic Grids#.	K4	12
V	**Merging the Grid services Architecture with the Web Services Architecture:** Service-Oriented Architecture, Web Service Architecture, #XML messages and Enveloping#, Service message description Mechanisms, Relationship between Web Services and Grid Services, Web services Interoperability and the role of the WS-I Organization.* **Current Trends –**Problem Solving Environment***.**	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Recall the basic elements and concepts of Grid computing.	K1	
	CO2: Understand the Grid computing tool kits and Framework.	K2	

	CO3: Apply concept of Anatomy of Grid Computing.	K3
	CO4: Assume the service oriented architecture.	K4
	CO5: Appraise the knowledge on grid and web service architecture.	K5

Learning Resources				
Text Books	1 Joshy Joseph and Craig Fellen stein, Grid computing, Pearson/IBM Press, PTR, 2004.			
Reference Books	1. Ahmer Abbas and Graig computing, A Practical Guide to technology and applications, Charles River Media,2003.			
Website Link	1. https://en.wikipedia.org/wiki/Grid_computing 2. https://link.springer.com/chapter/10.1007/978-1-84882-409-6_4 3. https://www.redbooks.ibm.com/redbooks/pdfs/sg246778.pdf			
Self-Study Material	1. https://en.wikipedia.org/wiki/Problem_solving_environment 2. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=574578			
	L-Lecture	T-Tutorial	P-Practical	C- Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M6UAME18	**GRID COMPUTING**	**DSE THEORY**	**VI**	**5**	**3**	**2**	**-**	**4**	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	L	M	L	M	S	L	M	L
CO2	M	L	M	L	S	M	L	M	L	S
CO3	S	M	L	L	L	S	M	L	L	L
CO4	S	S	S	M	L	S	S	S	M	L
CO5	M	S	L	M	S	M	S	L	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.V.Vengadesh	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

List of Skill Based Elective Course (SEC) for B.Sc., Computer Science – Artificial Intelligence and Machine Learning SYLLABUS - LOCF-CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2024-2025 Onwards		
S.No.	**COURSE_CODE**	**TITLE OF THE COURSE**
1	24M_UAMS01	Introduction To HTML
2	24M_UAMS02	Office Automation
3	24M_UAMS03	Qualitative Aptitude
4	24M_UAMS04	Cyber Forensics
5	24M_UAMS05	Multimedia Systems
6	24M_UAMS06	Software Testing
7	24M_UAMS07	Data Mining And Warehousing
8	24M_UAMS08	Bio Metrics
9	24M_UAMS09	Enterprise Resource Planning
10	24M_UAMS10	Robotics And Applications
11	24M_UAMS11	Simulation And Modeling
12	24M_UAMS12	Pattern Recognition
13	24M_UAMS13	Advanced Excel
14	24M_UAMS14	Open Source Software Technologies
15	24M_UAMS15	PHP Programming
16	24M_UAMS16	Web Technology
17	24M_UAMS17	Network Security
18	24M_UAMS18	Image Processing

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS01	**INTRODUCTION TO HTML**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn the comprehend a web page with graphics, links, tables, headings, lists, and other HTML elements.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Web Basics: What is Internet – Web browsers – What is Web page. **HTML Basics:** Understanding tags.	K1	6
II	T**ags for Document structure (HTML, Head, and Body Tag). Block level text elements:** Headings paragraph (<p>tag) – Font Style elements: (bold, italic, font, small, strong, strike, big tags).	K2	6
III	**Lists & Types of lists:** Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, and BR-Using Images – Creating Hyperlinks.	K3	6
IV	**Tables:** Creating basic able, Table elements, Caption – Table and cell alignment – Row span, Cols pan – Cell padding.	K4	6
V	**Frames:** Frame set – Targeted Links – No frame –forms: Input, Text area, Select, Option. **Current Trends-*** Use of AI-Powered Chabot's**.**	K5	6
	…… Self Study.		

Course Outcome	**CO1:** Recall the basic concepts of HTML and the notion of resources within HTML.	K1	
	CO2: Relate the concept of metadata, as well as comprehends file-saving procedures.	K2	
	CO3: Apply the page formatting and the concept of lists in HTML.	K3	
	CO4: List the links in HTML and grasps linking to email addresses.	K4	
	CO5: Recommend and add images and create tables in HTML.	K5	

Learning Resources				
Text Books	1. Mastering HTML5 and CSS3 Made Easy ‖, Teach U Comp Inc., 2014. 2. Thomas Michaud, "Foundations of Web Design : Introduction to HTML & CSS"			
Reference Books	1. Kenneth R Castleman, Digital image processing: Pearson Education,2/e,2003			
Website Link	1.https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5- CSS3.pdf 2.https://www.w3schools.com/html/default.asp			
Self-Study Material	1.https://www.lambdatest.com/blog/web-development-trends/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS01	NTRODUCTION TO HTML	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO 4	PSO5
CO1	M	S	M	S	S	L	M	S	M	S
CO2	L	M	L	S	M	S	S	M	S	S
CO3	M	S	S	M	S	S	S	S	M	S
CO4	S	M	M	S	S	S	M	M	S	M
CO5	S	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.E.Natarajan	HOD – Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS02	OFFICE AUTOMATION	SEC THEORY		2	2	-	-	2

Objective	Students have practical training in Microsoft Office, and enhance their proficiency in editor, spreadsheet, and presentation software.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introductory concepts:** Memory unit – CPU - Input **Devices:** Key board, Mouse and Scanner. **Output devices:** Monitor, Printer. **Introduction to Operating systems &its features:** DOS– UNIX–Windows. Introduction to Programming Languages	K1	6
II	**Word Processing:** Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker - Document formatting – Paragraph alignment, indentation, headers and footers, numbering; printing– Preview, options, merge.	K2	6
III	**Spreadsheets**: Excel-opening, entering extend data, formatting, navigating; Formulas – entering, handling and copying; Charts–creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics	K3	6
IV	**Database Concepts:** The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding Programming environment in DBMS; Developing menu drive application sin query language	K4	6
V	**Power point:** Introduction to Power point - Features – Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including	K5	6

	objects & pictures – Slide transition– Animation effects, audio inclusion, timers. **Current Trends - * Cloud-Based Office Automation Solutions***		
	…… Self Study.		
Course Outcome	**CO1:** Recall the basics of computer systems and its components.	K1	
	CO2: Understand the basic concepts of a word processing package.	K2	
	CO3: Apply the basic concepts of electronic spreadsheet application	K3	
	CO4: Analyze the database management system.	K4	
	CO5: Estimate a presentation using PowerPoint tool.	K5	

Learning Resources

Text Books	1. Peter Norton, "Introduction to Computers", 6th Edition, Tata McGraw Hill
Reference Books	1. Joyce Cox, Curtis Frye, M. Dow Lambert III, Steve Lambert, John Pierce, Joan Preppernau, "Microsoft office system 2007", 2nd Edition, PHI Learning pvt.
Website Link	1. https://www.w3schools.com/sql 2. https://www.tutorialspoint.com/sql
Self-Study Material	1. https://start.docuware.com/glossary/cloud-office-automation 2. https://ebookcentral.proquest.com/lib/inflibnet-

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Title	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS02	OFFICE AUTOMATION	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	L	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	M	S	M	L	L	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.E.Natarajan	HOD – Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning
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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS03	QUANTITATIVE APTITUDE	SEC THEORY		2	2	-	-	2

Objective	Students can understand the basic concepts of numbers and apply the concept of percentage, profit & loss, time and work.

Unit	Course Content	Knowledge Levels	Sessions
I	**Numbers-** HCF and LCM of numbers - Decimal fractions - Simplification - Square Root and cube roots - Average-problems on Numbers.	K1	6
II	**Problems on Ages** - Surds and Indices - percentage - profits and loss - ratio and proportion-partnership Chain rule.	K2	6
III	**Time and work** - pipes and cisterns - Time and Distance - problems on trains -Boats and streams - simple interest - compound interest - Logarithms - Area-Volume and surface area -races and Games of skill.	K3	6
IV	**Permutation and combination**-probability-True Discount-Bankers Discount – Height and Distances Odd man out& Series.	K4	6
V	**Calendar** - Clocks - stocks and shares - Data representation - Tabulation – Bar Graphs – Pie charts - Line graphs. **Current Trends - *** Mixture and Alligation**.**	K5	6
	…… Self Study		
Course Outcome	**CO1:** Remember the concepts, application and the problems of numbers.	K1	
	CO2: Understand basic knowledge and understanding about percentage, profit & loss related processing.	K2	
	CO3: Apply the concepts of time and work.	K3	

	CO4: Analyze about the concepts of probability, discount.	K4	
	CO5: Asses the concept of problem solving involved in stocks & shares, graphs.	K5	

Learning Resources				
Text Books	1.R.S.Aggarwal, Quantitative Aptitude, S.Chand & Company Ltd.			
Reference Books	2.Vikas Experts, Quantitative Aptitude for Competitive Examination, S.Chand & Company Ltd.			
Website Link	1. https://www.javatpoint.com/aptitude/quantitative 2. https://www.toppr.com/guides/quantitative-aptitude/			
Self-Study Material	1. https://www.geeksforgeeks.org/alligation-or-mixture-aptitude-questions/ 2. https://www.indiabix.com/aptitude/alligation-or-mixture /			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS03	QUANTITATIVE APTITUDE	SEC THEORY		2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO 3	PO4	PO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	M	M	L	S	M	M	M	L
CO2	M	S	L	M	M	S	M	M	M	L
CO3	M	M	S	S	M	M	M	M	M	M
CO4	S	M	M	S	S	M	M	M	M	M
CO5	L	M	S	S	S	L	M	M	M	S

Level of Correlation between CO and PO	L-LOW	M- MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs.V.Krishnaveni	HOD – Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning
Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS04	CYBER FORENSICS	SEC THEORY		2	2	-	-	2

Objective	Student can learn the analyze computer forensic evidence and data seizure. Identify the essential and up–to–date concepts, algorithms, protocols, tools, and methodology of Computer Forensics.

Unit	Course Content	Knowledge Levels	Sessions
I	**Overview of Computer Forensics Technology:** Computer Forensics Fundamentals: What is Computer Forensics? - Use of Computer - Forensics in Law Enforcement -Computer Forensics Assistance to Human-Resources/Employment Proceedings - Computer Forensics Services - Benefits of professional - Forensics Methodology - Steps taken by Computer Forensics - Specialists. Types of Computer. **Forensics Technology:** Types of Business Computer Forensic, Technology–Types.	K1	6
II	**Computer Forensics Evidence and capture:** Data Recovery: Data Recovery Defined - Data Back– up and Recovery - The Role of Back –up in Data Recovery, The Data –Recovery Solution. **Evidence Collection and Data Seizure:** Collection Options – Obstacles - Types of Evidence - The Rules of Evidence - Volatile Evidence - General Procedure - Collection and Archiving - Methods of Collections – Artefacts - Collection Steps - **Controlling Contamination:** The chain of custody.	K2	6

III	**Duplication and Preservation of Digital Evidence:** Processing steps - Legal Aspects of collecting and Preserving Computer forensic Evidence. **Computer image Verification and Authentication:** Special needs of Evidential Authentication - Practical Consideration - Practical Implementation.	K3	6
IV	**Computer Forensics Analysis: Discovery of Electronic Evidence:** Electronic - **Document Discovery:** A Powerful New Litigation Tool. **Identification of Data:** Time Travel - Forensic Identification and Analysis of Technical Surveillance Devices.	K4	6
V	**Reconstructing Past Events:** How to Become a Digital Detective, Useable File Formats, Unusable File Formats, Converting Files. **Networks:** Network Forensics Scenario - a technical approach - Destruction Of E–Mail - Damaging Computer Evidence – Documenting - The Intrusion on Destruction of Data - System Testing. **Current Trends** - * Biometric Authentication *	K5	6
	…… Self Study.		
	CO1: Recite the definition of computer forensics fundamentals.	K1	
Course Outcome	**CO2:** Classify the different types of computer forensics technology.	K2	
	CO3: Apply various computer forensics systems.	K3	
	CO4: Analyze the methods for data recovery, evidence.	K4	
	CO5: Determine the knowledge of duplication and preservation of digital evidence.	K5	
Learning Resources			
Text Books	1. John R. Vacca, —Computer Forensics: Computer Crime Investigation, 3/E, Firewall Media, New Delhi, 2002.		

Reference Books	1. Nelson, Phillips Enfinger, Steuart, —Computer Forensics and Investigations Enfinger, Steuart, CENGAGE Learning, 2004. 2. Anthony Sammes and Brian Jenkinson - Forensic Computing: A Practitioner ' s Guide,Second Edition, Springer–Verlag London Limited, 2007. 3. Robert M.Slade, Software Forensics Collecting Evidence from the Scene of a DigitalCrime, TMH 2005.			
Website Link	1. https://www.geeksforgeeks.org/cyber-forensics/			
Self-Study Material	1. https://jumpcloud.com/blog/biometric-totp 2fa#:~:text=Biometric%202FA%2C%20or%20biometric%20authentication,depresses%20keys%20on%20their%20keyboard).			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS04	CYBER FORENSICS	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	M	S	S	S	M	S	S	M	S
CO3	M	M	M	S	S	S	S	S	M	S
CO4	M	S	S	M	S	S	M	M	S	S
CO5	S	S	S	M	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.M.Purusothaman	HOD - G.Selvakumar	Member Secretary -Dr.S.Shahitha

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS05	MULTIMEDIA SYSTEMS	SEC THEORY		2	2	-	-	2

Objective	Students can understand the standards available for different audio, video and text applications. Learn various multimedia authoring systems in multimedia production team.

Unit	Course Content	Knowledge Levels	Sessions
I	**Multimedia Definition**- Use Of Multimedia- Delivering Multimedia- Text: About Fonts and Faces - Using Text in Multimedia - Computers and Text – Font Editing and Design Tools- Hypermedia and Hypertext.	K1	6
II	**Images:** Plan Approach - Organize Tools - Configure Computer Workspace -Making Still Images - Color - Image File Formats. Sound: The Power of Sound -Digital Audio- Midi Audio- Midivs.	K2	6
III	**Animation:** The Power of Motion- Principles of Animation – Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays- Digital Video Containers- Obtaining Video Clips -Shooting and Editing Video.	K3	6
IV	**Making Multimedia:** The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs - The Software Needs – An Authoring System Needs- Multimedia Production Team.	K4	6

V	**Planning and Costing:** The Process of Making Multimedia-Scheduling-Estimating - RFPs and Bid Proposals. Designing and Producing - Content and Talent: Acquiring Content- Ownership of Content Created for Project-Acquiring Talent.**Current Trends** - *High Definition Multimedia Interface (HDMI)*.	K5	6
	…… Self Study.		

Course Outcome	**CO1:** Define action script for a particular problem.	K1	
	CO2: Summarize customized GUI components.	K2	
	CO3: Apply Transformations on Components.	K3	
	CO4: Analyze the use of fundamental concepts and formulate best practices	K4	
	CO5: Evaluate the technical concepts and practices in specialized areas	K5	

Learning Resources				
Text Books	1.Tay Vaughan, "Multimedia: Making It Work", 8th Edition, Osborne/McGraw- Hill, 2001.			
Reference Books	1. Ralf Steinmetz & Klara Nahrstedt "Multimedia Computing, Communication & Applications",PearsonEducation,2012.			
Website Link	https://www.geeksforgeeks.org/what-is-multimedia/			
Self-Study Material	https://cie-group.com/how-to-av/videos-and-blogs/what-is-hdmi-high-definition-multimedia-.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS05	MULTIMEDIA SYSTEMS	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	S	S	S	S	M	S	M	M	S
CO3	M	M	M	S	S	S	M	S	M	S
CO4	M	S	M	M	S	M	M	M	S	S
CO5	S	S	S	M	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

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Mr.M.Purusothaman	HOD – G.Selvakumar	Member Secretary - Dr.S.Shahitha

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS06	SOFTWARE TESTING	SEC THEORY		2	2	-	-	2

Objective	Students able to study various Software techniques. Study fundamental concepts in software testing.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Purpose–Productivity and Quality in Software–Testing Vs Debugging –Model for Testing– Bugs – Types of Bugs – Testing and Design Style.	K1	6
II	**Flow / Graphs and Path Testing** – Achievable paths – Path instrumentation – Application– Transaction Flow Testing Techniques.	K2	6
III	**Data Flow Testing Strategies** - Domain Testing- Domains and Paths – Domains and Interface Testing.	K3	6
IV	**Linguistic–Metrics** – Structural Metric – Path Products and Path Expressions. Syntax Testing– Formats–Test Cases.	K4	6
V	**Logic Based Testing** – Decision Tables–Transition Testing– States, State Graph, State Testing. **Current Trends - *** Automation Testing *** *……* Self Study.	K5	6
	CO1: Define the basic concepts of functional (black box) software testing.	K1	
	CO2: Understand the basic application of techniques used to identify useful ideas for tests.	K2	

Course Outcome	**CO3**: Build the mission and communicate the status of your testing with the rest of your project team.	K3	
	CO4: Analyze the good bug report, peer-review the reports of your colleagues, and improve your own report writing.	K4	
	CO5: Evaluate the key testing concepts apply within the context of unified processes.	K5	

Learning Resources				
Text Books	1. B.Beizer,SoftwareTestingTechniques,IIEdn.,DreamTechIndia, NewDelhi. 2. K.V.K.Prasad,SoftwareTestingTools,DreamTech.India,NewDelhi,2005.			
Reference Books	1. Burnstein, PracticalSoftwareTesting‖,SpringerInternationalEdn, 2003. 2. Kit, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi, 1995. 3. R.RajaniandP, P.Oak, , SoftwareTesting, TataMcgrawHill, 2004, NewDelhi.			
Website Link	1.https://www.geeksforgeeks.org/software-testing-basics/			
Self-Study Material	1.https://www.globalapptesting.com/blog/what-is-automation-testing.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS06	SOFTWARE TESTING	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	S	M	S	S	M	S	M	M	S
CO3	M	M	S	S	S	S	S	S	S	S
CO4	M	S	M	M	S	M	M	S	S	S
CO5	S	S	S	M	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.M.Purusothaman	HOD - G.Selvakumar	Member Secretary - Dr.S.Shahitha

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS07	DATA MINING AND WAREHOUSING	SEC THEORY		2	2	-	-	2

Objective	Student can Learn the Concept of Data Mining and Warehousing techniques and study a set of typical clustering methodologies, algorithms and applications.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Data mining – Functionalities – Classification – Introduction to Data Warehousing. **Data Preprocessing:** Preprocessing the Data – Data cleaning – Data Integration and Transformation – Data Reduction.	K1	6
II	**Data Mining Primitives, Languages and System Architecture:** Data Mining – Primitives – Data Mining Query Language, Architecture of Data mining Systems. **Concept Description, Characterization and Comparison:** Concept Description, Data Generalization and Summarization.	K2	6
III	**Mining Association Rules:** Basic Concepts – Single Dimensional Boolean Association Rules From Transaction Databases, Multilevel Association Rules from transaction databases.	K3	6
IV	**Classification and Prediction:** Introduction – Issues –Decision Tree Induction – Bayesian Classification –Classification of Back Propagation.	K4	6
V	**Cluster Analysis:** Introduction – Types of Data in Cluster Analysis, Petitioning Methods – HierarchicalMethods-Density Based Methods. **Current trends:** * Multimedia Data mining*	K4	6
	…… Self Study.		

Course Outcome	**CO1:** Recall the basic Concepts and Functionalities of Data mining.	K1	
	CO2: Illustrate the Concept of Data mining system architectures.	K2	
	CO3: Apply the Principles of Association rules.	K3	
	CO4: Examine the analytical idea on Classification and prediction methods.	K4	
	CO5: Assess the Cluster analysis and its methods.	K4	

Learning Resources				
Text Books	1.Han and M. Kamber, — Data Mining Concepts and Techniques, 2001, Harcourt India Pvt. Ltd, New Delhi.			
Reference Books	1. K.P. Soman, Shyam Diwakar, V. Ajay —Insight into Data Mining Theory and Practice — Prentice Hall of India Pvt. Ltd, New Delhi. 2. Parteek Bhatia, Data Mining and Data Warehousing: Principles and Practical Techniques', Cambridge University Press, 2019.			
Website Link	1.https://www.javatpoint.com/data-mining			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS07	DATA MINING AND WAREHOUSING	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	S	S	S	S	S	M	S	S	S
CO2	S	M	M	S	S	S	S	S	S	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	S	S	S	M	S	M	M	S	S	S
CO5	M	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.K.Vijayakumar	HoD – Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS08	BIOMETRICS	SEC THEORY		2	2	-	-	2

Objective	Students can learn and understand biometric technologies and their functionalities, role of biometrics, computational methods and context of Biometric Applications.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**: What is Biometrics - History - Types of biometric Traits - General architecture of biometric systems - Basic working of biometric matching? **Face Biometrics:** Introduction - Background of Face Recognition - Design of Face Recognition System.	K1	6
II	**Retina and Iris Biometrics:** Introduction - Performance of Biometrics - Design of Retina Biometrics - Design of Iris Recognition System - Iris Segmentation Method - Determination of Iris Region - Determination of Iris Region.	K2	6
III	**Privacy Enhancement Using Biometrics:** Introduction - Privacy Concerns Associated with Biometric Deployments - Identity and Privacy - Privacy Concerns - Biometrics with Privacy Enhancement - Comparison of Various Biometrics in Terms of Privacy - Soft Biometrics.	K3	6
IV	**Watermarking Techniques:** Introduction - Data Hiding Methods - Basic Framework of Watermarking - Classification of Watermarking - Applications of Watermarking - Attacks on Watermarks - Performance Evaluation - Characteristics of Watermarks - General Watermarking Process.	K4	6
V	**Scope and Future:** Scope and Future Market of Biometrics - Biometric Technologies - Applications of Biometrics - Biometrics and Information Technology Infrastructure - Role of Biometrics in Enterprise Security - Role of Biometrics in Border Security - Smart Card Technology and Biometrics.	K5	6

	Current Trends-*Contactless Biometrics ***.**		
	…… Self Study.		
Course Outcome	**CO1:** Define the various biometric technologies.	K1	
	CO2: Demonstrate of biometric recognition.	K2	
	CO3: Apply simple applications for privacy.	K3	
	CO4: Analyze the need of biometric in the society.	K4	
	CO5: Determine the scope of biometric techniques.	K5	

Learning Resources	
Text Books	1. G.R Sinha and Sandeep B.Patil, "Biometrics: Concepts and Applications" - Wiley, 2013.
Reference Books	1. . Bolle, SharathPankanti, Nalinik.Ratha, Andrew W.Senior, Jonathan H. Connell , "Guide to Biometrics" by Ruud M Springer 2009. 2. Anil k. Jain, Arun A. Ross, KarthikNandakumar, "Introduction to Biometrics". 3. Anil K. Jain, Patrick Flynn, ArunA.Ross, "Hand book of Biometrics".
Website Link	1.https://en.wikipedia.org/wiki/Biometrics. 2.https://www.techtarget.com/searchsecurity/definition/biometrics
Self-Study Material	1.https://www.neurotechnology.com/contactless-biometrics.html 2.https://vilmate.com/blog/contactless-biometric-identification/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS08	BIOMETRICS	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	M	M
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	M	M	M	S
CO4	S	S	S	S	S	S	M	M	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video Presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.E.Natarajan	HOD – Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS09	**ENTERPRISE RESOURCE PLANNING**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn the creating a process map, and subsequently improving or simplifying the process, apply these improvements to an ERP implementation, aiming for enhanced efficiency and effectiveness within organization.							

Unit	Course Content	Knowledge Levels	Sessions
I	**ERP Introduction, Benefits, Origin, Evolution and Structure:** Conceptual Model of ERP, the Evolution of ERP, the Structure of ERP, Components and needs of ERP, ERP Vendors; Benefits & Limitations of ERP Packages.	K1	6
II	**Need to focus on Enterprise Integration/ERP:** Information mapping; Role of common shared Enterprise database; System Integration, Logical vs. Physical System Integration, Benefits & limitations of System Integration.	K2	6
III	**ERP Marketplace and Marketplace Dynamics:** Market Overview, Marketplace Dynamics, the Changing ERP Market. ERP- Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain.	K3	6
IV	**ERP Implementation:** Basics, ERP implementation Strategy, ERP Implementation Life Cycle ,Pre- Implementation task, Role of SDLC/SSAD, Object Oriented Architecture, Consultants, Vendors and Employees.	K4	6
V	ERP & E-Commerce, Future Directives- in ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture. Using ERP tool: either SAP or ORACLE format to case study. **Current Trends-***Cloud-ERP*	K5	6

	…… Self Study.		
Course Outcome	**CO1:** Recite the basic concepts of ERP.	K1	
	CO2: Classify different technologies used in ERP.	K2	
	CO3: Apply the concepts of ERP Manufacturing Perspective and ERP Modules.	K3	
	CO4: Analyze the benefits of ERP.	K4	
	CO5: Evaluate different tools used in ERP.	K5	

Learning Resources				
Text Books	1.Alexis Leon-Enterprise Resource Planning – , Tata McGraw Hill.			
Reference Books	1. Diversified by Alexis Leon -Enterprise Resource Planning - TMH. 2. Ravi Shankar & S. Jaiswa,Galgotia-Enterprise Resource Planning .			
Website Link	1. https://www.sap.com/india/products/erp/what-is-erp.html#:~:text=Enterprise%20resource%20planning%20(ERP)%20is,services%2C%20procurement%2C%20and%20more.			
Self-Study Material	1.https://www.netsuite.com/portal/resource/articles/erp/cloud-erp.shtml			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS09	ENTERPRISE RESOURCE PLANNING	SEC THEORY		2	2	-	-	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	M	M
CO2	S	S	S	M	S	S	S	S	M	S
CO3	S	S	S	S	S	S	M	M	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion - Quiz program - Model preparation.
Teaching and Learning Methods	Audio Video lecture - Chalk and Board class - Assignment - PPT Presentation and Video presentation.
Assessment Methods	Class Test - Unit Test - Assignment - CIA-I - CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.A.Raja	HOD –Mr.G.Selvakumar	Member Secretary – Dr.S.Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637408.

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS10	**ROBOTICS AND ITS APPLICATIONS**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Students can able to familiar with the various drive systems of robots, sensors and their applications in robots.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Introduction, brief history, components of robotics, classification, workspace, work-envelop, motion of robotic arm, end-effectors and its types, service robot and its application, Artificial Intelligence in Robotics.	K1	6
II	**Actuators and sensors:** Types of actuators, stepper-DC-servo- and brushless motors- model of a DC servo motor-types of transmissions-purpose of sensor-internal and external sensor-common sensors-encoders tachometers.	K2	6
III	**Localization:** Self-localizations and mapping - Challenges in localizations – IR based localizations – vision based localizations – Ultrasonic based localizations - GPS localization systems.	K3	6
IV	**Path Planning:** Introduction, path planning-overview-road map path planning-cell decomposition path planning potential field path planning-obstacle avoidance-case studies.	K3	6
V	**Application:** Ariel robots-collision avoidance robots for agriculture-mining-exploration-underwater-civilian- and military applications- nuclear applications-space applications**.** **Current Trends* :** AI and Machine Learning Integration - Collaborative Robots (Cobots)*****	K4	6

	Self Study		
Course Outcome	**CO1:** Define the different physical forms of robot architectures.	K1	
	CO2: Summarize the Kinematics model simple manipulator and mobile robots.	K2	
	CO3: Develop a kinematic robot system.	K3	
	CO4: Analyze manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.	K3	
	CO5: Determine robotics algorithms related to kinematics, control, optimization, and uncertainty.	K4	

Learning Resources	
Text Books	1. RicharedD.Klafter. Thomas Achmielewski and MickaelNegin, Robotic Engineering and Integrated Approach, Prentice Hall India-Newdelhi-2001 2. SaeedB.Nikku, Introduction to robotics, analysis, control and applications, Wiley-India, 2 nd edition 2011
Reference Books	1. M.P.Groover et.al, Industrial robotic technology-programming and application, McGrawhill2008.
Website Link	1. https://www.electronicsforu.com/tech-zone/tech-of-robotics/robotics-types-applications 2. https://www.electronicsforu.com/tech-zone/tech-of-robotics/robotics-types-applications
Self-Study Material	1. https://www.computer.org/publications/tech-news/trends/ai-and-machine-learning-integration 2. https://www.automate.org/robotics/cobots/what-are-collaborative-robots

	L-Lecture	T-Tutorial	P-Practical	C- Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24M_UAMS10	ROBOTICS AND ITS APPLICATIONS	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	S	M	M	S
CO2	S	S	S	S	S	S	M	S	M	S
CO3	S	M	S	S	S	M	S	M	M	M
CO4	S	S	M	S	S	M	S	S	M	M
CO5	S	S	M	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion - Quiz program - Model preparation.
Teaching and Learning Methods	Audio Video lecture - Chalk and Board class - Assignment - PPT Presentation and Video presentation.
Assessment Methods	Class Test - Unit Test - Assignment - CIA-I - CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.T.Prabhu	HoD – Mr.G.Selvakumar	Member Secretary - Dr.S.Shahitha

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning

Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24MUAMS11	SIMULATION AND MODELLING	SEC THEORY		2	2	-	-	2

Objective	Students can learn simulation requirements, utilize diverse tools, focus on creating software environments, cover critical infrastructure modeling, control tools, entity modeling, path planning, algorithms, and modeling.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction To Modeling & Simulation:** What is Modeling and Simulation – Complexity Types – Model Types – Simulation Types – M&S Terms and Definitions Input Data Analysis – Simulation Input Modeling – Input Data Collection - Data Collection Problems - – Input Modeling Strategy - Histograms –Probability Distributions - Selecting a Probability Distribution.	K1	6
II	**Random Vitiate Generation Random Numbers** : Random Number Generators – General principles – Inverse Transform Method –Acceptance Rejection Method – Composition Method –Relocate and Rescale Method - Specific distributions-Output Data Analysis – Introduction -Types of Simulation With Respect to Output Analysis - Stochastic Process and Sample Path - Sampling and Systematic Errors - Mean, Standard Deviation and Confidence Interval - Analysis of Finite- Horizon Simulations - Single Run - Independent Replications - Sequential Estimation – Analysis of Steady-State Simulations - Removal of Initialization Bias (Warm-up Interval) - Replication-Deletion Approach - Batch-Means Method .	K2	6
III	**Comparing Systems via Simulation:** Introduction – Comparison Problems - Comparing Two Systems - Screening Problems - Selecting the Best - Comparison with a Standard - Comparison with a Fixed Performance Discrete Event Simulations – Introduction - Next-Event Time Advance - Arithmetic and Logical Relationships -	K3	6

	Discrete-Event Modeling Approaches – Event- Scheduling Approach – Process Interaction Approach.		
IV	**Entity Modeling:** Entity Body Modeling – Entity Body Visualization – Entity Body Animation – Entity Interaction Modeling – Building Modeling Distributed Simulation – High Level Architecture (HLA) – Federation Development and Execution Process (FEDEP) – SISO RPR FOM Behavior Modeling – General AI Algorithms - Decision Trees Neural Networks - Finite State Machines - Logic Programming - Production Systems – Path Planning - Off-Line Path Planning - Incremental Path Planning - Real-Time Path Planning – Script Programming -Script Parsing – Script Execution.	K4	6
V	**Algorithms:** Optimization Algorithms – Genetic Algorithms – Simulated Annealing Examples: Sensor Systems Modeling – Human Eye Modeling – Optical Sensor Modeling – Radar Modeling. **Current Trends-*** Additive Manufacturing and Generative Design**.**	K5	6
	*……*Self Study.		
Course Outcome	**CO1:** Recall modeling and simulation concepts, analyze input data, and model.	K1	
	CO2: Understand random variants and number generation, analyze simulations and methods.	K2	
	CO3: Apply systems by comparing them through simulation.	K4	
	CO4: Compare the Entity Body Modeling, Visualization, Animation.	K4	
	CO5: Evaluate the Algorithms and Sensor Modeling.	K5	

Learning Resources	
Text Books	1. Jerry Banks, JohnWiley&Sons,Handbook of Simulation: Principles, Methodology, Advances,ApplicationsandPractice,Inc.,1998. 2.GeorgeS.Fishman,DiscreteEventSimulation:Modeling,ProgrammingandAnalysis,Springer-VerlagNewYork,Inc.,2001.

Reference Books	1.AndrewF.Seila,VlatkoCeric,PanduTadikamalla,"AppliedSimulationModeling" ThomsonLearningInc.,2003.			
Website Link	1. https://www.tutorialspoint.com/modelling_and_simulation/index.htm 2. https://www.javatpoint.com/verilog-simulation-basics			
Self-Study Material	https://www.designnews.com/design-software/five-trends-that-will-define-simulation-and-test-in-2023			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
Syllabus LOCF - CBCS with effect from 2024-2025 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24MUAMS11	SIMULATION AND MODELLING	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CONumber	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	M	S	M	S
CO2	M	M	M	S	M	S	S	M	S	S
CO3	M	S	S	M	S	S	S	S	M	S
CO4	S	M	M	S	S	S	M	M	S	M
CO5	S	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion - Quiz program - Model preparation.
Teaching and Learning Methods	Audio Video lecture - Chalk and Board class - Assignment - PPT Presentation and Video presentation.
Assessment Methods	Class Test - Unit Test - Assignment - CIA-I - CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.M.Ravi	HOD – Mr.G.Selvakumar	Member Secretary Dr.S.Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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Rasipuram - 637408.

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS12	**PATTERN RECOGNITION**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn the Pattern Recognition techniques and its applications.							

Unit	Course Content	Knowledge Levels	Sessions
I	**PATTERN RECOGNITION OVERVIEW:** Pattern recognition, Classification and Description-Patterns and feature Extraction with Examples-Training and Learning in PR systems-Pattern recognition Approaches	K1	6
II	**STATISTICAL PATTERN RECOGNITION:** Introduction to statistical Pattern Recognition-supervised Learning using Parametric and Non-Parametric Approaches.	K2	5
III	**LINEAR DISCRIMINANT FUNCTIONS AND UNSUPERVISED LEARNING AND CLUSTERING**: Introduction-Discrete and binary Classification Problems Techniques to directly Obtain linear Classifiers - Formulation of Unsupervised Learning Problems-Clustering for unsupervised learning and classification.	K3	7
IV	**SYNTACTIC PATTERN RECOGNITION:** Overview of Syntactic Pattern Recognition-Syntactic recognition via parsing and other grammars–Graphical Approaches to syntactic pattern recognition-Learning via grammatical inference.	K4	6
V	**NEURAL PATTERN RECOGNITION:** Introduction to Neural Networks-Feed forward Networks and training by Back Propagation-Content Addressable Memory Approaches and Unsupervised Learning in Neural PR. **Current Trends:** *Signal and image processing, Computer vision and pattern recognition*.	K5	6

	…… Self Study.		
Course Outcome	**CO1:** Define the fundamentals of Pattern Recognition techniques	K1	
	CO2: Exaplain the various Statistical Pattern recognition techniques	K2	
	CO3: Construct the linear discriminant functions and unsupervised learning and clustering	K3	
	CO4: Discover the various Syntactical Pattern recognition techniques	K4	
	CO5: Evaluate the Neural Pattern recognition techniques	K5	

Learning Resources

Text Books	1. Robert Schalkoff, —"Pattern Recognition: Statistical Structural and Neural Approaches", John wiley & sons
Reference Books	1. Earl Gose, Richard Johnson baugh, Steve Jost, —"Pattern Recognition and Image Analysis", Prentice Hall of India, Pvt Ltd, New Delhi. 2. Duda R.O., P.E.Hart & D.G Stork, — "Pattern Classification", 2nd Edition, J.Wiley. 3. Duda R.O.& Hart P.E., —"Pattern Classification and Scene Analysis", J.wiley. 4. Bishop C.M., —"Neural Networks for Pattern Recognition", Oxford University Press.
Website Link	1. https://auth.geeksforgeeks.org/roadBlock_v2.php 2. https://www.javatpoint.com/pattern-recognition-in-machine-learning
Self-Study Material	3. https://www.tutorialspoint.com/applications-of-pattern-recognition 4. http://www.ccas.ru/voron/download/books/machlearn/webb02statistical.pdf

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning
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Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
24MUAMS12	PATTERN RECOGNITION	SEC THEORY		2	2	-	-	2

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	M	S	M	S
CO2	M	M	M	S	S	S	S	S	S	S
CO3	S	S	M	S	S	M	M	S	M	S
CO4	M	S	S	M	S	M	S	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz Program, Model Preparation.
Teaching and Learning Methods	Audio, Video lecture, Chalk And Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.P. Sakthivel	HOD – Mr.G. Selvakumar	Member Secretary Dr.S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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Rasipuram - 637408.

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24MUAMS13	**ADVANCED EXCEL**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn Handle the large amounts of data, validation of data with Excel functions, Create a pivot tables to consolidate data from multiple files Presenting charts and Graphs.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Basics of Excel:** Customizing common options- Absolute and relative cells- Protecting and un-protecting worksheets and cells- Working with Functions - Writing conditional expressions - logical functions - lookup and reference functions- VlookUP with Exact Match, Approximate Match- Nested VlookUP with Exact Match- VlookUP with Tables, Dynamic Ranges- Nested VlookUP with Exact Match- Using VLookUP to consolidate Data from Multiple Sheets.	K1	6
II	**Data Validations:** Specifying a valid range of values - Specifying a list of valid values- Specifying custom validations based on formula - Working with Templates Designing the structure of templates for standardization of worksheets - Sorting and Filtering Data - Sorting tables.	K2	6
III	**Pivot tables:** Creating Pivot tables Formatting and customizing Pivot tables advanced options of Pivot tables- Pivot charts- Consolidating data from multiple sheets and files using Pivot tables- external data sources- data consolidation feature to consolidate data- Show Value As % of Row, % of Column, Running Total, Compare with Specific Field- Viewing Subtotal Under Pivot- Creating Slicers.	K3	6

IV	**More Functions:** Date and time functions- Text functions- Database functions- Power Functions - Formatting Using auto formatting option for worksheets- Using conditional formatting option for rows, columns and cells- What If Analysis - Goal Seek- Data Tables-Scenario Manager.	K4	6

V	**Charts:** Charts - Formatting Charts- 3D Graphs- Bar and Line Chart together- Secondary Axis in Graphs- Sharing Charts with PowerPoint / MS Word, Dynamically- New Features of Excel Sparklines, Inline Charts, data Charts- Overview of all the new features. **Current Trends -** *Macros*	K5	6
	…… Self Study.		
Course Outcome	**CO1:** Recall the functions to handle large amounts of data in Excel.	K1	
	CO2: Summarize the template for validating a data	K2	
	CO3: Develop a pivot table to consolidate data from multiple files.	K3	
	CO4: Inspect a spread sheet using advanced functions in Excel.	K4	
	CO5: Determine a data in the form of charts and graphs.	K5	

Learning Resources				
Text Books	1. Excel 2019 All. 2. Microsoft Excel 2019 Pivot Table Data Crunching.			
Reference Books	1. Ritu Arora -Mastering Advanced Excel Paperback – 21 July 2023			
Website Link	1. https://www.tutorialspoint.com/advanced_excel/index.htm 2. https://www.w3schools.com/EXCEL/index.php			
Self-Study Material	1. https://www.geeksforgeeks.org/macros-in-excel/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M_UAMS13	**ADVANCED EXCEL**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	M	M	M	M	L	S
CO2	S	S	M	M	M	S	M	M	L	L
CO3	M	M	M	S	S	S	M	L	M	L
CO4	M	M	M	S	S	S	S	M	M	M
CO5	M	M	S	M	M	S	M	L	S	L

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.M.Purusothaman	**HOD - G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS14	**OPEN SOURCE SOFTWARE TECHNOLOGIES**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn to OOPS concepts and analyze overriding and packages through java programs and identify the significance and application of Classes, arrays and Interfaces and analyzing java arrays.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Open Source:** open source vs. commercial software – What is Linux? – Free Software – Where I can use Linux? - Linux kernel – Linux distributions.	K1	6
II	**Introduction Linux Essential Commands** – File System concept – Standard Files –The Linux Security Model – Introduction to Unix – Unix Components Unix Files.	K2	6
III	**Introduction** - Apache Explained – Starting, Stopping and Restarting Apache –Modifying the Default configuration – securing Apache – Set user and Group.	K3	6
IV	**MySQL:** Introduction to MySQL – The show databases and table – The USE command –Create Database and Tables – Describe Table.	K4	6
V	**Introduction to PHP:** PHP Form processing – Database Access with PHP – MySQL, MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records. **Current Trends- *** Open Source Software for Sustainability**.**	K5	6
	…… Self Study.		

Course Outcome	**CO1:** Recall the basic concepts in Java, application of OOPS concepts.	K1	
	CO2: Acquire knowledge about operators and decision making statements.	K2	
	CO3: Identify significance and application of Classes, arrays and interfaces and analyzing java arrays.	K3	
	CO4: Analyze applications of OOPS concepts and analyze overriding and packages through java programs.	K4	
	CO5: Recommend window-based programming using applet and graphics programming.	K5	

Learning Resources	
Text Books	1. James Lee and Brent Ware "Open Source Web Development with LAMP Using. 2. LINUX, Apache, MySQL, Perl and PHP", Dorling Kindersley (India) Pvt. Ltd, 2008.
Reference Books	1. Eric Rosebrock, Eric Filson, "Setting up LAMP: Getting Linux, Apache, MySQL and PHP and working together", John Wiley and Sons, 2004. 2. Anthony Butcher , "Teach Yourself MySQL in 21 days", 2nd Edition, Sams Publication. 3. Rich Bower, Daniel Lopez Ridreejo, Alian Liska , "Apache Administrator‟s Handbook", Sams Publication. 4. Tammy Fox, "RedHat Enterprise Linux 5 Administration Unleashed", Sams Publication. 5. Naramore Eligabette, Gerner Jason, Wrox Press, Wiley Dreamtech Press,"Beginning PHP5, Apache, MySQL Web Development", 2005.
Website Link	1.Introduction to Open-Source and its benefits - GeeksforGeeks 2.https://www.bing.com/
Self-Study Material	1.https://www.openlogic.com/blog/open-source-trends#open-source-software-for-sustainability

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS14	**OPEN SOURCE SOFTWARE TECHNOLOGIES**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	M	M	S	S	S	S	S	M	S
CO3	S	S	M	S	S	S	M	S	M	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.E.Natarajan	**HOD – Mr.G.Selvakumar**	**Member Secretary – Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS15	**PHP PROGRAMMING**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Students can able to understand the necessary knowledge to design and develop web application development techniques and knowledge on OOPS.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to PHP:** Basic Knowledge of websites - Dynamic Website- Scope of PHP XAMPP and WAMP Installation.	K1	6
II	**Basics of PHP Programming:** Syntax of PHP-Embedding PHP in HTML Embedding HTML in PHP. PHP Variable - Understanding Data Types Using Operators -Using Conditional Statements -If(), else if() and else if condition Statement.	K2	6
III	**Control Statements and Functions:** Switch() Statements-Using the while() Loop-Using the for() Loop PHP Functions. PHP Functions-Creating an Array-Modifying Array Elements Processing Arrays with Loops-Grouping Form Selections with Arrays-Using Array Functions.	K3	6
IV	**PHP File Concepts**: Reading and Writing Files -Reading Data from a file.	K4	6
V	**Managing Sessions and Using Session Variables:**Destroying a Session Storing Data in Cookies-Setting Cookies. **Current Trends- *** The evolution of PHP web applications*	K5	6
	…… Self Study.		
Course Outcome	**CO1** Remember the PHP scripts to handle processor.	K1	

	CO2: Understand the regular expressions including modifiers, operators, and meta characters.	K2	
	CO3: Apply the Program using the concept of array.	K3	
	CO4: Analyze the uses of various PHP library functions	K4	
	CO5: Estimate a website.	K5	

Learning Resources	
Text Books	1. Lynnmighley and Michael Morrison, Head First PHP & MySQL: A Brain-Friendly Guide-2009 2. Alan Forbes, The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL
Reference Books	1. Steven Holzner, PHP: The Complete Reference. 2. DTEditorial Services (Author), HTML5 Black Book (CoversCSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery),Paperback2016,2ndEdition.
Website Link	1.Refer MOOC Courses like NPTEL and SWAYAM https://www.w3schools.com/php/
Self-Study Material	https://www.sciencedirect.com/science/article/abs/pii/S0950584915002062

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS15	**PHP PROGRAMMING**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	S	S	S	M	S	M	S
CO2	S	M	S	S	S	M	S	S	M	S
CO3	M	M	M	S	S	S	S	S	M	S
CO4	M	S	S	M	S	S	M	M	S	S
CO5	S	S	S	M	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.V.VENGADESH	**HOD -Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS16	**WEB TECHNOLOGY**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn the basic web concepts and to create rich internet applications that use most recent client-side programming technologies.							

Unit	Course Content	Knowledge Levels	Sessions
I	**HTML:** HTML-Introduction-tag basics- page structure-adding comments working with texts, paragraphs and line break. Emphasizing test- heading and horizontal rules-list-font size, face and color-alignment- links-tables-frames.	K1	6
II	**Forms & Images Using Html:** Graphics: Introduction-How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia, data collection with html forms textbox, password, list box, combo box, text area, tools for building web page front page	K2	6
III	**XML & DHTML:** Cascading style sheet (CSS)-what is CSS-Why we use CSS-adding CSS to your web pages-Grouping styles-extensible markup language (XML).	K3	6
IV	**JavaScript:** Client side scripting, What is JavaScript, How to develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition.	K4	6
V	**Ajax:** Introduction, advantages &disadvantages, Purpose of it, ajax based web application, alternatives of ajax Java Script &	K5	6

	AJAX: Introduction to array-operators, making statements-date & time-mathematics- strings-Event handling-form properties. AJAX. Introduction to jQuery and Angular JS. **Current Trends:***Biggest Web Development Trends*		
	…… Self Study.		
Course Outcome	**CO1:** Define and publish Web pages using Hypertext Markup Language (HTML).	K1	
	CO2: Summarize page styles and layout with Cascading Style Sheets (CSS).	K2	
	CO3: Sketch the role of languages to create a capstone.	K3	
	CO4: Correlate client-side web programming languages like HTML, DHTML, CSS, XML, JavaScript, and AJAX.	K4	
	CO5: Criticize the use of j Query and Angular JS.	K5	

Learning Resources				
Text Books	1.Pankaj Sharma, —Web Technology, Sk Kataria &SonsBangalore, 2011.(UNIT I, II, III &IV). 2. Achyut S Godbole & Atul Kahate, —Web Technologies, 2002, 2nd Edition. (UNIT V:AJAX).			
Reference Books	1.Laura Lemay, Rafe Colburn , Jennifer Kyrnin, "Mastering HTML, CSS & Javascript Web Publishing,2016. 2. DT Editorial Services (Author), —HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery), Paperback 2016, 2ndEdition.			
Website Link	1. https://www.w3schools.com/			
Self-Study Material	1. https://careerfoundry.com/en/blog/web-development/8-biggest-trends-in-web-development-trends/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M_UAMS16	**WEB TECHNOLOGY**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	S	M	S	S	M
CO2	L	M	L	S	M	M	S	S	S	S
CO3	M	S	S	M	S	S	M	S	S	S
CO4	S	M	M	S	S	S	S	S	S	S
CO5	S	S	M	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE

Designed By	Verified By	Approved By
Mrs.R.Suguna	**HoD – Mr.G.Selvakumar**	**Member Secretary** **Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS17	**NETWORK SECURITY**	**DSE THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn to number theory used for network security, understand the design concept of cryptography and authentication, and develop experiments on algorithm used for security.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Model of network security**–Security attacks, services and attacks– OSI security architecture – Classical encryption techniques – SDES – Block cipher Principles DES– Strength of DES–Block cipher design principles – Block cipher mode of operation.	K1	6
II	**Number Theory:** Prime number–Modular arithmetic–Euclid's algorithm.	K2	6
III	**Authentication requirement** : Authentication function – MAC – Hash function –Security of hash function and MAC – SHA - HMAC – CMAC.	K3	6
IV	**Authentication applications:** Kerberos – X.509 Authentication services - E-mail security–IP security- Web security.	K4	6
V	**Intruder:**Intrusion detection system–Virus and related threats– Counter measures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security. **Current Trends:***Most Dangerous Virus & Malware Threats *	K4	6
	***……* Self Study.**		

Course Outcome	**CO1:** Recite the fundamentals of networking and security.	K1
	CO2: Interpret the complexities of protecting networks and systems from attack.	K2
	CO3: Apply the tools used to detect and protect against malicious attacks.	K3
	CO4: Analyze the skills to configure various security-related technologies.	K4
	CO5: Measure the protocols such as TLS/SSL, IPSec, and SNMP in order to build secure systems.	K4

Learning Resources				
Text Books	1.WilliamStallings,—Cryptography&NetworkSecurity,PearsonEducation,FourthEdition 2010.			
Reference Books	1.CharlieKaufman,RadiaPerlman,MikeSpeciner,—NetworkSecurity,Privatecommunicationinpublicworld‖,PHISecondEdition,2002. 2.BruceSchneier,NeilsFerguson,—PracticalCryptography,WileyDreamtechIndiaPvtLtd,FirstEdition,2003. 3. DouglasRSimson—Cryptography–Theoryandpractice,CRCPress,FirstEdition,1995.			
Website Link	1. https://www.geeksforgeeks.org/network-security/			
Self-Study Material	1 https://www.safetydetectives.com/blog/most-dangerous-new-malware-and-security-threats/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Title	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS17	**NETWORK SECURITY**	**DSE THEORY**		**2**	**2**	**-**	**-**	**2**

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	S	M	L	M	M
CO2	L	M	L	S	M	S	L	S	M	M
CO3	M	S	S	M	S	M	S	M	S	S
CO4	S	M	M	S	S	S	S	M	S	S
CO5	S	S	M	M	M	M	M	M	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mrs.R.Suguna	**HoD – Mr.G.Selvakumar**	**Member SecretaryDr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M_UAMS18	**IMAGE PROCESSING**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**
Objective	Student can learn concepts of degradation function and restoration techniques and study the image segmentation and representation techniques.							

Unit	Course Content	Knowledge Levels	Sessions
I	**DIGITAL IMAGE FUNDAMENTALS**: Steps in Digital Image Processing – Components – Elements of Visual Perception – Image Sensing and Acquisition – Image Sampling and Quantization	K1	6
II	**IMAGE ENHANCEMENT**: Spatial Domain: Gray level transformations – Histogram processing – Basics of Spatial Filtering– Smoothing and Sharpening Spatial Filtering.	K2	6
III	**IMAGE RESTORATION**: Image Restoration - degradation model, Properties, Noise models – Mean Filters – Order Statistics – Adaptive filters	K3	6
IV	**IMAGE SEGMENTATION**: Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation – Region growing – Region splitting and merging.	K4	6
V	**IMAGE COMPRESSION AND RECOGNITION**: Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, JPEG standard, MPEG. **Current Trends-*** Image processing advanced studies ***.**	K5	6
	*……*Self Study.		
	CO1: Define the fundamentals of digital image processing.	K1	
	CO2: Understand the basics of how digital images are represented and processed.	K2	

Course Outcome	**CO3:** Build image enhancement techniques.	K4
	CO4: Classify the programming skills to apply digital image processing algorithms.	K4
	CO5: Evaluate the solutions for real-world problems that involve digital image processing.	K5

Learning Resources				
Text Books	1. Anil K. Jain , Digital Image Processing: Principles and Applications. 2. Wayne Niblack, "Introduction to Digital Image Processing". 3. B.S. Manjunath and Srimat T.V. Rao, "Digital Image Processing: An Algorithmic Approach Using Java".			
Reference Books	1. Rafael C. Gonzalez and Richard Eugene Woods, "Digital Image Processing".			
Websit Link	1. https://www.learnopencv.com/•. 2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-435j-digital-imageprocessing-fall-2004/•. 3. http://web.stanford.edu/class/cs155/•.			
Self-Study Material	1. https://www.youtube.com/watch?v=uJvqbZtGIh4.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M_UAMS18	**IMAGE PROCESSING**	**SEC THEORY**		**2**	**2**	**-**	**-**	**2**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	S	M	S	S	S
CO2	M	M	M	S	S	S	S	M	S	S
CO3	M	S	S	M	S	S	S	S	M	S
CO4	S	M	S	S	S	S	M	S	S	S
CO5	S	S	M	M	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation.
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation.
Assessment Methods	Class Test, Unit Test, Assignment, CIA-I, CIA-II and ESE.

Designed By	Verified By	Approved By
Mr.M.Ravi	**HOD – Mr.G.Selvakumar**	**Member Secretary Dr.S.Shahitha**

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Type	**Sem**	**Hours**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M5UAMIS1	**INTERNSHIP / INDUSTRIAL TRAINING**	**INTERNSHIP**	**V**	**-**	**-**	**-**	**-**	**2**
Objective	Students can acquire optimum exposure on the practical aspects of IT industry.							

S. No.	Guidelines for Internship Training Programme	Knowledge Levels	Sessions
1	The student should undergo **15 Days Internship** training in IT industry/ Private sector during the vacation which starts at the end of the 4th Semester.	K2-K4	
2	The training bridges the gap between the theoretical knowledge gained in the college and the practical application of the same in the institute / industry / company. The student will have a better exposure about the workplace and its nuances.		
3	Schedule of visit to be made by the staff is to be prepared by the HOD / Staff-in-charge.		
4	The trainees should strictly adhere to the rules and regulations and working hours of the institutions to which they are attached.		
5	A Staff member of a Department (Guide) will be monitoring the performance of the Candidate.		
6	The students should maintain a daily E-Attandance where the student should record his details of the training.		
7	The trainees have to obtain a certificate on successful completion of the internship from the chief executive of industry.		
8	The student should submit an attendance certificate to the institution for 15 days internship training from industry.		
9	Internship Training Report (30 – 50 pages) should be prepared by the student and submitted in a month's time and at the		

	end of the semester student should present the report with a power point presentation.		
10	Industrial training reports shall be prepared by the students under the supervision of the faculty of the department.		
11	Industrial training report must contain the following: Cover page, Copy of training certificate, Profile of an industry report about the work undertaken by them during the tenure of training observation about the concern findings.		
12	Viva – voce examination will be conducted with internal & external examiners at the end of the **5th semester** and the credits will be awarded.		
13	Report Evaluation: External Viva-Voce examination will be conducted and the maximum mark is 100.		
Course Outcome	**CO1:** Apply new techniques and ideas in Computer industry	K3	
	CO2: Analyze the results of new initiatives	K4	
	CO3: Create a new work plan with greater output	K6	
	CO4: Create a framework of work execution ideas	K6	
	CO5: Create a detailed technical work plan and terminologies to be followed in industry.	K6	
Learning Resources			
Text Books	1. The Successful Internship by H. Frederick Sweitzer, Mary A. King, 2013. 2. Social Media Tools in Experiential Internship Learning by Samuel Kai Wah Chu, 2020.		
Reference Books	1. The Intern Files: How to Get, Keep and Make the Most of Your Internship by Jamie Fedorko, 2006.		
Website Link	1.https://www.tutorialspoint.com/r/index.htm 2.https://www.javatpoint.com/net-framework 3.https://www.w3schools.com/java/java_intro.asp 4.https://www.w3schools.com/r/		

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B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Type	**Sem**	**Hours**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M5UAMIS1	**INTERNSHIP / INDUSTRIAL TRAINING**	**INTERNSHIP**	**V**	**-**	**-**	**-**	**-**	**2**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	M	S	S	S	S
CO2	S	M	S	S	S	S	M	S	S	S
CO3	M	S	S	S	S	M	S	S	S	S
CO4	S	M	S	S	S	S	M	S	S	S
CO5	M	S	S	S	S	M	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	-
Assessment Methods	**CIA – 100 Marks** 1. Work Log Book – 25 Marks 2. Training Report and Viva-Voce – 75 Marks

Designed By	Verified By	Approved By
Mrs.K.Gayathri	HOD - Mr.G.Selvakumar	Member Secretary - Dr.S.Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAMPR1	**PROJECT WORK**	**PROJECT WORK**	**VI**	**-**	**-**	**-**	**5**	**5**
Objective	Students can grasp the real-time software development environment and acquire comprehensive knowledge of the chosen problem and programming language/software for their project work.							

Guidelines for Project Work

PROJECT PLANNING:

Bachelor of Artificial Intelligence and Machine Learning Project is a complex undertaking that requires meticulous planning well in advance. The topic must be selected at the beginning of the final year, with related reading, training, and project discussions to be completed during the first term.

SELECTION OF TEAM:

Mini project is approached collaboratively as a team effort. It is recommended to select team members randomly, practical considerations may allow students the option to self-organize into teams of two members each, with a designated team leader. Each team must maintain written minutes of meetings and ensure clear assignment of tasks to every member. These meeting minutes will be incorporated into the project report. Despite working in groups, each student must independently handle distinct modules of the project and submit individual reports.

SELECTION OF TOOLS:

Students are free to choose any platform, tools, or programming languages for their project work, with a strong recommendation towards open source options wherever feasible. The evaluation of the project will not consider the choice of tools as a criterion.

REGULATIONS OF PROJECT WORK

Three copies of the project report must be submitted by each student.

The final outer dimensions of the project report shall be 21cm X 30 cm.

Only hard binding should be done. The text of the report should be set in 12pt, Times New Roman, 1.5 spaced. Headings should be set as follows: CHAPTER HEADINGS 16pt, Times New Roman, Bold, All caps and Centered.

Section Headings 14pt Times New Roman, Bold, Left adjusted. Section Sub-heading 12pt, Times New Roman.

Title of figures, tables etc.., and are done in 12 point, Times New Roman, Bold and Centered.

1.5 space need be left above a section or subsection heading and no space may be left after them. References shall be IEEE format (see any IEEE magazine for detail).

While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list. The Candidate should submit the filled in format as given in Annexure-I to the department for approval during the First Week of December.

Periodically the project should be reviewed.

A Sample format is enclosed in Annexure-II.

Format of the Title page and Certificate are enclosed in Annexure III.

The students may use power point presentation during their viva voce examination.

Course Outcome	**CO1:** Identification of Research Area	K4	
	CO2: Analyze of problem solving skills	K4	
	CO3: Analyze sources for conduct of Research	K4	
	CO4: Evaluate the research report	K5	
	CO5: Create the research report	K6	

Learning Resources	
Text Books	1. Research Methodology: Methods and Techniques, by C.R. Kothari, New Age Publications, 2009.
Reference Books	1. Research Methodology: Methods and Techniques by C.R. Kothari, New Age Publications, 1985. 2. Essentials of Research Design and Methodology by: Geoffrey R. Marczyk, David DeMatteo, David Festinger, 2005.
Website Link	1. http://gen.lib.rus.ec/

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
24M6UAMPR1	**PROJECT WORK**	**PROJECT WORK**	**VI**	**-**	**-**	**-**	**5**	**5**	

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	S	M	M	S	S	S
CO2	S	S	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	S	S	M	M
CO4	S	S	S	M	S	S	S	S	M	M
CO5	M	M	M	S	S	M	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Working with programming languages such as R, Python, Java, .Net, etc..,
Assessment Methods	Attendance, Review / Work Diary, Final Report and Viva Voce

Designed By	Verified By	Approved By
Mr.P.Mohankumar	HOD – Mr.G.Selvakumar	Member Secretary - Dr.S.Shahitha

B.Sc. Computer Science - Artificial Intelligence and Machine Learning Syllabus LOCF - CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAMOE1	**ARTIFICIAL INTELLIGENCE FOR COMPETITIVE EXAM**	**PROFESSIONAL COMPETENCY SKILL (SELF STUDY)**	**VI**	**-**	**-**	**-**	**-**	**2**
Objective	Students get awareness among students about competitive examinations, imparting knowledge on their impact, and fostering a positive attitude towards appearing in such exams.							

Guidelines for Competitive Examination

This course comprehensively covers Python, Data Structures and algorithms, Open Source Software Technologies, Operating Systems, Problem Solving Techniques, Database Management Systems, Computer Networks, Programming Languages (with a focus on Java), Artificial Intelligence, and Machine Learning.

It emphasizes recent advancements in these fields and aims to provide a holistic understanding through factual content and multiple-choice questions (MCQs). This makes it highly suitable for university and institute students preparing for entrance exams, as well as those gearing up for national and state-level competitive exams like TANCET, IBPS, and SSC, which follow an MCQ format.

1. Objective type online examination will be conducted at the end of 6th semester.
2. Questions must be taken from all courses of the Artificial Intelligence and Machine Learning Programme.
3. Test critical thinking through multiple-choice questions that challenge learners to interpret facts, evaluate situations, explain cause and effect relationships, make inferences, and predict outcomes.
4. Emphasize higher-level thinking with memory-plus application-oriented questions that prompt students to recall principles, rules, or facts within real-life contexts.
5. HOD's instruct to the faculty to prepare minimum 500 questions booklet (cumulatively for each programme) with solutions and circulate among the students.

Course Outcome	**CO1:** Remember the fundamental techniques for implementing programming languages.	K1	
	CO2: Interpret problem solving techniques to develop skills for competitive exams.	K2	
	CO3: Organize Computational problems for real time problems.	K3	
	CO4: Analyze Computer techniques and software development fundamentals to produce computing-based solutions	K4	
	CO5: Evaluate complex computing problems to apply fundamental computing principles effectively.	K5	
Learning Resources			
Reference Books	1. Computer Knowledge for SBI/ IBPS Clerk/ PO/ RRB/ RBI/ SSC/ Insurance Exams 2nd Edition, Disha Publication. 2. M.C.Qs For Competitive Exams Computer Science, LBH Authors' Division, Library Book House.		
Website Link	1. https://nptel.ac.in/courses/106106092 2. https://www.digimat.in/nptel/courses/video/106101061/L01.html 3. https://www.digimat.in/nptel/courses/video/106104122/L01.html		

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M6UAMOE1	**ARTIFICIAL INTELLIGENCE FOR COMPETITIVE EXAM**	**PROFESSIONAL COMPETENCY SKILL (SELF STUDY)**	**VI**	**-**	**-**	**-**	**-**	**2**

CO - PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	M	M	S	S	S
CO2	S	S	S	S	S	M	S	S	S	S
CO3	L	M	S	S	M	S	S	S	M	M
CO4	M	S	L	M	S	L	S	S	M	M
CO5	M	M	M	S	S	M	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Learning Computer Science Courses.
Assessment Methods	CIA I and CIA II Exams

Designed By	Verified By	Approved By
Mrs.N.Hyrunnisha **Mrs.R.Suguna** **Mr.E.Natarajan**	**HOD - Mr.G.Selvakumar**	**Member Secretary - Dr.S.Shahitha**