Affiliated to Periyar University, Salem | Accredited by **NAAC** with '**A**' Grade
Recognized by **UGC** under Section 2(f) & 12 (B)

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous College)

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

(Semester Pattern)

(For Candidates admitted from the academic year 2023-2024 and onwards)

Regulation and Syllabus for B.Sc., Computer Science

(With effect from the Academic Year 2023-24)

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, thereby 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 a resource 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.

DEPARTMENT OF COMPUTER SCIENCE

Vision:

- To attain global recognition in computer science research and training to meet the growing needs of the industry and society.

Mission:

- To impart quality education Imparting through a well-designed curriculum in turn with the challenging software needs of the industry.
- To provide state-of-art research facilities to generate knowledge and develop technologies in the thrust areas of computer science.
- To develop linkages with world class organizations to strengthen industry-academia relationships for mutual benefit.

PREAMBLE

The B. Sc. (Computer Science) course is systematically designed three year degree program under the faculty of Science and Technology. The objective of the course is to prepare students to undertake careers involving problem solving using computer science and technologies, or to pursue advanced studies and research in computer science. The syllabus which comprises of Computer Science subject along with that of the three allied subjects (Mathematics and Statistics) covers the foundational aspects of computing sciences and also develops the requisite professional skills and problem solving abilities using computing sciences.

Introduction: At the first year of under-graduation, the basic foundations of two important skills required for software development are laid. A course in problem solving and programming along with a course in database fundamentals forms the preliminary skill set for solving computational problems. The practical courses are designed to supplement the theoretical training in the year. Along with Computer Science, the two theoretical and one practical course each in Statistics, Mathematics and Electronics help in building a strong foundation. Career Advancement courses are introduced in both semesters to cover additional areas of Computer Science.

At the second year of under-graduation, computational problem solving skills are further strengthened by a course in Data structures. Software engineering concepts that are required for project design are also introduced. Essential concepts of computer networking are also introduced in this year. The practical course included in both semesters complements the theory courses.

At the third year of under-graduation, all the subjects are designed to fulfill core Computer Science requirements as well as meet the needs of the software industry. Theory courses are adequately supplemented by hands-on practical courses. Skill Enhancement courses enable the students to acquire additional value-added skills.

PROGRAMME LEARNING OUTCOME

NATURE AND EXTENT OF THE PROGRAMME

The undergraduate programs in Computer Science builds on science-based education at +2 level. The +2 senior secondary school education aims and achieves a sound grounding in understanding the basic scientific temper with introduction to process of computation by introducing some programming languages. This prepares a young mind to launch a rigorous investigation of exciting world of computer science. Framing and implementation of curricula and syllabi is envisaged to provide an understanding of the basic connection between theory and experiment and its importance in understanding the foundation of computing. This is very critical in developing a scientific temperament and to venture a career which a wide spectrum of applications as well as theoretical investigations. The undergraduate curriculum provides students with theoretical foundations and practical experience in both hardware and software aspects of computers. The curriculum in computer science is integrated with courses in the sciences and the humanities to offer an education that is broad, yet of enough depth and relevance to enhance student employment opportunities upon graduation. As a Bachelor's degree program, the curriculum is based on the criterion that graduates are expected to function successfully in a professional employment environment immediately upon graduation.

AIM OF THE PROGRAMME

The program aims to impart fundamental and hands on knowledge of Computers, Science of Computing and modern science technologies to students. It will be useful for careers in research & development corporate sectors and higher studies in M.Sc. Computer Science. Furthermore, an emphasis on collaborative projects, teamwork, and effective communication skills aims to produce computer science professionals who can thrive in interdisciplinary environments and contribute meaningfully to the evolving field of computing. The program on Computer Science equips students with comprehensive skills on computer systems, hardware, databases, cloud computing, and networks both at the conceptual and application levels. The knowledge gained under this program will be relevant to pursue higher education and for job opportunities in various organizations.

GRADUATE ATTRIBUTES

The students graduating in Graduate Attributes (GAs) are qualities and skills that students shall acquire while doing their graduation in Muthayammal College of Arts and Science College. Graduate attributes include theoretical and practical knowledge, skills, attitudes, societal concerns and values that are expected to be acquired by a graduate through studies at Muthayammal College of Arts and Science College. The graduate attributes include capabilities that strengthen students' abilities for widening current knowledge base and skills, gaining new knowledge and skills, undertaking future studies, performing well in a chosen career and playing a constructive role as a responsible citizen in the society. Graduate attributes are fostered through meaningful learning experiences made available through the curriculum, the total college experiences and a process of critical and reflective thinking.

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 theconcepts.

PO2: Graduates will focus on sustainable goals that might bring about spherical developments

PO3: Graduates will infuse a spirit converging on bricking a teamwork, 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)

PSO1: Acquire the required knowledge in the Hardware and Software aspects of Computer Science field.

PSO2: Understood the development methodologies of Software systems and the ability to analyze, design and develop computer applications for real life problems.

PSO3: Knowledge and skills to collaborate and communicate with peers for performance enhancement in IT field.

PSO4: Ability to understand and adapt with the dynamic technical environment for the growth of IT Industry.

PSO5: Capacity to transfer the skills gained, to provide innovative and novel solutions by maintaining ethical norms for the betterment of society.

REGULATIONS (2023-2024)

1. 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. Candidate for admission to the first year of B.Sc. Degree Course in Computer Science shall be required to have passed the Higher Secondary pass with Mathematics as one of the Subject OR Higher Secondary Pass with Computer Science / Computer Applications / Information Technology / Computer Technology / Business Mathematics/ Statistics as one of the courses and have not studied Mathematics should undergo a bridge course on Mathematics for a minimum duration of 15 days.

3. CREDIT REQUIRMENTS AND ELIGIBILITY FOR AWARD 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 aperiod 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 distributiongiven 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
PART II	English	12
PART III	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
PARTV	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 timeto 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 6th Standard).

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 lacks40 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 TwoYears 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 condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) 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 tocomplete 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 totime.

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 fromthe 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 forthe same program with same nomenclature.

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

Provided the Student should have passed all the courses in the Institution fromwhere 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 theCollege 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
CIA I & II	**15**
Attendance	**5**
Assignment/Quiz	**5**
Total	**25**

6.4 Awarding Marks for Attendance (out of 5)

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

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 coursewhich is offered in V Semester for I year UG students.

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

6.7.3 Total Marks for the Course = 100

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

The passing minimum for this course is 40%

6.7.3 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** a) Attendance **b)** Review / Work Diary*1	10 Marks 30 Marks	**40**
Work Diary	25	-			
Report	50	50			
Viva-voce	25	50			
Examination					
Total	**100**	**100**	**ESE*2** a) Final Report 40Marks b)Viva-voce 20Marks		**60**
			Total		100

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

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

6.9 Guidelines 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 haveto reappear for the same in the subsequent semesters.

QUESTION PAPER PATTERN FOR CIA I, II AND ESE	
(3 HOURS)	**MAXIMUM:75Marks**
SECTION-A (**Objective Type**) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(10 x1=10 marks)
SECTION-B (**Either or Type**) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(5 x 5 = 25 marks)
SECTION-C (**Either or Type**) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(5 x 8 = 40 marks)
(Syllabus for CIA-I 2.5 Unit ,Syllabus for CIA-II All 5 Unit)	

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% [FortyPercentage] 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 of 40%

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 schemeof 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 thefinal 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 Examinationsare 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

7

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 sumof the multiplication of grade points by the credits of the entire programme dividedby the sum of the credits of the courses of the entire programme

Where,

Ci= Credits earned for course I in any semester,

Gi=GradePointsobtainedforcourseiinanysemestern=Semesterinwhichsuchcourseswere credited.

7.2 Letter Grade and Classification

CGPA	GRADE	CLASSIFICATION OF FINAL RESULT
9.5-10.0	O+	First Class -Exemplary*
9.0 and above but below9.5	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 prescribedsemester 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 ITSELF 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 beallowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span =N+2years for the completion of programme.)

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MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

B.Sc. COMPUTER SCIENCE abstract under LOCF-CBCS Pattern with effect from 2023-2024 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 Paper	Total Credit
			No.of Paper	Credit	No.of Paper	Credit	No.of Paper	Credit	No.of Paper	Credit	No.of Paper	Credit	No.of Paper	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	DSC THEORY	III	1	5	1	5	1	5	1	5	3	14	2	10	9	44
4	DSC PRACTICAL	III	1	3	1	3	1	3	1	3	2	4	1	3	7	19
5	DSE THEORY	III									2	6	2	6	4	12
6	GEC THEORY	III	1	3	1	3	1	3	1	3					4	12
7	PROJECT WORK	III											1	4	1	4
8	SKILL ENHANCEMENT COURSES(SEC)	IV			1	2	1	2	1	2					3	6
9	ENTREPRENEURIAL BASED (ANY ONE) - SEC 4	IV													0	0
10	FC THEORY	IV	1	2											1	2
11	SKILL ENHANCEMENT COURSES (NME)	IV	1	2	1	2	1	2	1	2					4	8
12	INTERNSHIP	IV									1	2			1	2
13	PROFESSIONAL COMPETENCT SKILLS	IV											1	2	1	2
14	ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)-EVS	IV							1	2					1	2
15	ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)-VALUE EDUCATION - YOGA	IV									1	2			1	2
16	EXTENSION ACTIVITY	V											1	1	1	1
	Cumulative Credits		**7**	**21**	**7**	**21**	**7**	**21**	**8**	**23**	**9**	**28**	**8**	**26**	**46**	**140**

Total No. of Subjects	46
Marks	**4500**

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

Extra Credit	4
	144

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous), Rasipuram - 637 408.
Scheme of Examinations LOCF-CBCS Pattern
(for the Students Admitted from the Academic Year:2023-2024 Onwards)

Programme : B.Sc. Computer Science

SEM	PART	STUDY COMPONENTS	COURSE CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
					Lect.	Lab.		CIA	ESE	TOTAL
SEMESTER - I										
I	I	LANGUAGE - I	23M1UFTA01	TAMIL - I	6	-	3	25	75	100
I	II	LANGUAGE - II	23M1UFEN01	ENGLISH - I	6	-	3	25	75	100
I	III	DSC THEORY - I	23M1UCSC01	PYTHON PROGRAMMING	5	-	5	25	75	100
I	III	GEC THEORY - I	23M1UMAA03	ALLIED : DISCRETE MATHEMATICS - I	4	-	3	25	75	100
I	III	DSC PRACTICAL - I	23M1UCSP01	PRACTICAL : PYTHON PROGRAMMING	-	5	3	40	60	100
I	IV	NMEC - I	23M1UELN01	PRINCIPLES OF CELLULAR COMMUNICATION AND SMARTPHONES	2	-	2	25	75	100
I	IV	FC THEORY - I	23M1UCSFC1	PROBLEM SOLVING TECHNIQUES	2		2	25	75	100
				TOTAL	**25**	**5**	**21**	**190**	**510**	**700**
SEMESTER - II										
II	I	LANGUAGE - I	23M2UFTA02	TAMIL – II	6	-	3	25	75	100
II	II	LANGUAGE - II	23M2UFEN02	ENGLISH – II	6	-	3	25	75	100
II	III	DSC THEORY - II	23M2UCSC02	DATA STRUCTURE AND ALGORITHMS	5	-	5	25	75	100
II	III	DSC PRACTICAL - II	23M2UCSP02	PRACTICAL : DATA STRUCTURE AND ALGORITHMS USING PYTHON	-	5	3	40	60	100
II	III	GEC THEORY - II	23M2UMAA04	ALLIED: DISCRETE MATHEMATICS - II	4	-	3	25	75	100
II	IV	SEC PRACTICAL - I	23M2UCSSP1	PRACTICAL : HTML PROGRAMMING	-	2	2	40	60	100
II	IV	NMEC - II	23M2UELN03	PC AND LAPTOP MAINTENANACE	2	-	2	25	75	100
				TOTAL	**23**	**7**	**21**	**205**	**495**	**700**

SEM	PART	STUDY COMPONENTS	COURSE CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
					Lect.	Lab.				
SEMESTER - III										
III	I	LANGUAGE - I	23M3UFTA03	TAMIL – III	6	-	3	25	75	100
III	II	LANGUAGE - II	23M3UFEN03	ENGLISH - III	6	-	3	25	75	100
III	III	DSC THEORY - III	23M3UCSC03	MICROPROCESSOR AND MICROCONTROLLER	5	-	5	25	75	100
III	III	GEC THEORY - III	23M3USTA08	ALLIED : STATISTICAL METHODS AND ITS APPLICATIONS - I	4	-	3	25	75	100
III	III	DSC PRACTICAL - III	23M3UCSP03	PRACTICAL: MICROPROCESSOR ANDMICROCONTROLLER	-	5	3	40	60	100
III	IV	SEC PRACTICAL - II	23M3UCSSP2	PRACTICAL : PHP PROGRAMMING	-	2	2	40	60	100
III	IV	NMEC - III	23M3UMAN01	QUANTITATIVE APTITUDE - I	2	-	2	25	75	100
III	IV	AECC-ENVIRONMENTAL STUDIES *	23M4UEVS01	ENVIRONMENTAL STUDIES	-	-	-	-	-	-
				TOTAL	**23**	**7**	**21**	**205**	**495**	**700**
SEMESTER - IV										
IV	I	LANGUAGE - I	23M4UFTA04	TAMIL – IV	6	-	3	25	75	100
IV	II	LANGUAGE - II	23M4UFEN04	ENGLISH - IV	6	-	3	25	75	100
IV	III	DSC THEORY - IV	23M4UCSC04	JAVA PROGRAMMING	5	-	5	25	75	100
IV	III	DSC PRACTICAL - IV	23M4UCSP04	PRACTICAL : JAVA PROGRAMMING	-	5	3	40	60	100
IV	III	GEC THEORY - IV	23M4USTA09	ALLIED : STATISTICAL METHODS AND ITS APPLICATIONS - II	4	-	3	25	75	100
IV	IV	SEC PRACTICAL - III	23M4UCSSP3	PRACTICAL: MULTIMEDIA SYSTEMS	-	2	2	40	60	100
IV	IV	AECC-ENVIRONMENTAL STUDIES *	23M4UEVS01	ENVIRONMENTAL STUDIES	-	-	2	100	-	100
IV	IV	NMEC - IV	23M3UMAN03	QUANTITATIVE APTITUDE - II	2	-	2	25	75	100
				TOTAL	**23**	**7**	**23**	**305**	**495**	**800**

SEM	PART	STUDY COMPONENTS	COURSE CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
					Lect.	Lab.				
SEMESTER – V										
V	III	DSC THEORY - V	23M5UCSC05	SOFTWARE ENGINEERING	5	-	5	25	75	100
V	III	DSC THEORY - VI	23M5UCSC06	DATABASE MANAGEMENT SYSTEM	5	-	5	25	75	100
V	III	DSC THEORY - VII	23M5UCSC07	MOBILE APPLICATION DEVELOPMENT	4	-	4	25	75	100
V	III	DSE THEORY - I	23M5UCSE_	ELECTIVE – I	4	-	3	25	75	100
V	III	DSE THEORY - II	23M5UCSE_	ELECTIVE – II	4	-	3	25	75	100
V	III	DSC PRACTICAL - V	23M5UCSP05	PRACTICAL: DATABASE MANAGEMENT SYSTEM	-	3	2	40	60	100
V	III	DSC PRACTICAL - VI	23M5UCSP06	PRACTICAL : MOBILE APPLICATION DEVELOPMENT	-	3	2	40	60	100
V	IV	AECC-VALUE EDUCATION	23M5UVED01	YOGA	2	-	2	100	-	100
V	IV	INTERNSHIP	23M5UCSIS1	INTERNSHIP	-	-	2	100	-	100
				TOTAL	**24**	**6**	**28**	**405**	**495**	**900**
SEMESTER – VI										
VI	III	DSC THEORY - VIII	23M6UCSC08	COMPUTER NETWORKS	5	-	5	25	75	100
VI	III	DSC THEORY - IX	23M6UCSC09	.NET PROGRAMMING	5	-	5	25	75	100
VI	III	DSE THEORY - III	23M6UCSE_	ELECTIVE – III	5	-	3	25	75	100
VI	III	DSE THEORY- IV	23M6UCSE_	ELECTIVE – IV	5	-	3	25	75	100
VI	III	DSC PRACTICAL -VII	23M6UCSP07	PRACTICAL : .NET PROGRAMMING	-	5	3	40	60	100
VI	III	PROJECT WORK	23M6UCSPR1	PROJECT WORK	5	-	4	40	60	100
VI	IV	PROFESSIONAL COMPETENCY SKILLS	23M6UCSOE1	COMPUTER SCIENCE FOR COMPETITIVE EXAMS	-	-	2	100	-	100
VI	V	EXTENSION ACTIVITY	23M6UEXA01	EXTENSION ACTIVITY	-	-	1	-	-	-
				TOTAL	**25**	**5**	**26**	**280**	**420**	**700**
				OVERALL TOTAL	**142**	**38**	**140**	**1590**	**2910**	**4500**
VI		EXTRA CREDIT	23M6UCSEC1	EXTRA CREDIT SWAYAM/MOOC ONLINE	-	-	2	-	-	-
		EXTRA CREDIT		VALUE ADDED COURSE	-	-	2	-	-	-

HOD **MEMBER SECRETARY ACADEMIC COUNCIL** **PRINCIPAL**

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UCSC01	PYTHON PROGRAMMING	DSC THEORY - I	I	5	5	-	-	5
Objective	Students can understand the concepts of Python programming.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Basics of Python Programming:** History of Python-Features of Python- Literal-Constants-Variables - Identifiers-Keywords-Built-in Data Types- Output Statements – Input Statements-Comments – Indentation- Operators-Expressions-Type conversions. Python Arrays: Defining and Processing Arrays – Array methods.	K1	12
II	**Control Statements:** Selection/Conditional Branching statements: if, if- else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. **Jump Statements:** break, continue and pass statements.	K2	12
III	**Functions:** Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. **Function Arguments**: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments-Recursion. **Python Strings:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. **Modules**: import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules.	K3	12
IV	**Lists:** Creating a list -Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples- Difference between lists and tuples. **Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.	K4	12
V	**Python File Handling:** Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files.	K5	12
Course Outcome	**CO1:** Remember the basics of python	K1	
	CO2: Understand and use various constructs of the programming	K2	
	CO3: Apply the concept of string and user-defined function	K3	
	CO4: Analyze the process of list and dictionaries.	K4	
	CO5: Evaluate the concept of files	K5	

Learning Resources	
TextBooks	1. Reema Thareja, ―Python Programming using problem solving approach‖, First Edition, 2017, Oxford University Press. 2.Dr. R. Nageswara Rao, ―Core Python Programming‖, First Edition, 2017, Dream techPublishers.
Reference Books	1.VamsiKurama, ―Python Programming: A Modern Approach‖, Pearson Education. Mark Lutz, ‖Learning Python‖, Orielly. 2.Adam Stewarts, ―Python Programming‖, Online. 3.Fabio Nelli, ―Python Data Analytics‖, APress. 4.Kenneth A. Lambert, ―Fundamentals of Python – First Programs‖, CENGAGE Publication.
Website Link	1. https://www.programiz.com/python-programming 2. https://www.guru99.com/python-tutorials.html
L-Lecture T-Tutorial P-Practical C-Credit	

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UCSC01	PYTHON PROGRAMMING			DSC THEORY - I	I	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	S	S	M	S
CO2	S	M	S	S	S	S	M	S	M	S
CO3	M	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				Conducting Group Discussion, Class test						
Teaching and Learning Methods				Handling classes through chalk & talk method and presentation						
Assessment Methods				Attendance, Assignment, CIA I, CIA II and ESE						
Designed By			**Verified By**			**Approved By**				
M.Sudha			HOD Mr.P.Subramaniam			Member Secretary Dr.S.Shahitha				

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UCSP01	PYTHON PROGRAMMING	DSC PRACTICAL - I	I	5	-	-	5	3
Objective	Students can familiarize the different control and decision making statements, arrays, strings and files.							

S.No.	**List of Experiments / Programs**	**Knowledge Levels**	**Sessions**
1	Program using variables, constants, I/O statements in Python.	K1,K2	4
2	Program using Operators in Python.	K2	4
3	Program using Conditional Statements.	K2,K3	4
4	Program using Loops.	K3	4
5	Program using Jump Statements.	K3,K4	4
6	Program using Functions.	K3,K4	4
7	Program using Recursion.	K4	4
8	Program using Arrays.	K4,K5	4
9	Program using Strings.	K4,K5	4
10	Program using Modules.	K4,K5	4
11	Program using Lists.	K4,K5	5
12	Program using Tuples.	K4,K5	5
13	Program using Dictionaries.	K4,K5	5
14	Program for File Handling.	K4,K5	5
Course Outcome	**CO1:** Remember all the statements in python	K1	
	CO2: Understand the problem and construct the algorithm	K2	
	CO3: Apply the algorithm that are relevant to the casual	K3	
	CO4: Analyze the source lines that are match up with the casual	K4	
	CO5: Evaluate the flow of execution	K5	

Learning Resources	
Text Books	1. Reema Thareja, ―Python Programming using problem solving approach‖, First Edition, 2017, Oxford University Press. 2.Dr. R. Nageswara Rao, ―Core Python Programming‖, First Edition, 2017, Dream techPublishers.
Reference Books	1.VamsiKurama, ―Python Programming: A Modern Approach‖, Pearson Education. Mark Lutz, ‖Learning Python‖, Orielly. 2.Adam Stewarts, ―Python Programming‖, Online.3.Fabio Nelli, ―Python Data Analytics‖, APress. 4.Kenneth A. Lambert, ―Fundamentals of Python – First Programs‖, CENGAGE Publication.
Website Link	1. https://www.programiz.com/python-programming 2. https://www.guru99.com/python-tutorials.html
L-Lecture T-Tutorial P-Practical C-Credit	

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UCSP01	PYTHON PROGRAMMING			DSC PRACTICAL - I	I	5	-	-	5	3
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	M	S	S	S	S	M	S	M	S
CO3	M	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				Give more sample programs to related topic						
Teaching and Learning Methods				Handling Practical Session through projector						
Assessment Methods				Attendance, Observation, CIA I, CIA II and ESE						

Designed By	**Verified By**	**Approved By**
M.Sudha	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UCSC02	DATA STRUCTURE AND ALGORITHMS	DSC THEORY-II	II	5	5	-	-	5
Objective	Students can understand the concepts of ADTs,lists, stacks, queues							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Abstract Data Types (ADTs)- List ADT-array-based implementation- linked list implementation singly linked lists-circular linked lists-doubly-linked lists-applications of lists-Polynomial Manipulation- All operations-Insertion-Deletion-Merge-Traversal	K1	12
II	Stack ADT-Operations- Applications- Evaluating arithmetic expressions – Conversion of infix to postfix expression-Queue ADT-Operations-Circular Queue- Priority Queue- deQueue applications of queues.	K2	12
III	Tree ADT-tree traversals-Binary Tree ADT-expression trees-applicationsof trees-binary search tree ADT- Threaded Binary Trees-AVL Trees- B-Tree- B+ Tree – Heap-Applications of heap.	K3	12
IV	Definition- Representation of Graph- Types of graph-Breadth first traversal – Depth first traversal-Topological sort- Bi-connectivity – Cut vertex- Euler circuits-Applications of graphs.	K4	12
V	Searching- Linear search-Binary search-Sorting-Bubble sort-Selection sort-Insertion sort-Shell sort-Radix sort-Hashing-Hash functions- Separate chaining- Open Addressing-Rehashing Extendible Hashing.	K5	12
Course Outcome	**CO1:** Remember the concept of memory management, data types	K1	
	CO2: Understand basic data structures such as arrays, linked lists, stacks and queues	K2	
	CO3: Apply the hash function and concepts of collision and its resolution methods	K3	
	CO4: Analyze problem involving graphs, trees and heaps	K4	
	CO5: Evaluate Algorithm for solving problems like sorting, searching	K5	

Learning Resources	
Text Books	1. Mark Allen Weiss, —Data Structures and Algorithm Analysis in C++‖, Pearson Education 2014, 4th Edition. 2. Reema Thareja, —Data Structures Using C‖, Oxford Universities Press 2014, 2nd Edition
Reference Books	1. Thomas H.Cormen,Chales E.Leiserson,Ronald L.Rivest, Clifford Stein, —Introduction to Algorithms‖, McGraw Hill 2009, 3rd Edition. 2. Aho, Hopcroft and Ullman, —Data Structures and Algorithms‖, Pearson Education 2003
Website Link	1.https://www.programiz.com/dsa 2.https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

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

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UCSC02	DATA STRUCTURE AND ALGORITHMS			DSC THEORY-II	II	5	5	-	-	5
CO-POMapping										
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	M	S	S	S	S	M	S	M	S
CO3	M	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				Conducting Group Discussion, Class test						
Teaching and Learning Methods				Handling classes through chalk & talk method, PPT presentation						
Assessment Methods				Attendance, Assignment, CIA I, CIA II and ESE						
Designed By				**Verified By**			**Approved By**			
M.Sudha				HOD Mr.P.Subramaniam			Member Secretary Dr.S.Shahitha			

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UCSP02	DATA STRUCTURE AND ALGORITHMS LAB	DSC PRACTICAL - II	II	5	-	-	5	3
Objective	Students can understand the concepts of ADTs,linear data structures-lists, stacks, queues							

S. No.	**List of Experiments / Programs**	**Knowledge Levels**	**Sessions**
1	Write a program to implement the List ADT using arrays and linked lists.	K1	6
2	Write a programs to implement the following using a singly linked list. i)Stack ADT ii) Queue ADT	K2	6
3	Write a program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).	K2,K3	6
4	Write a program to implement priority queue ADT.	K3	6
5	Write a program to perform the following operations: i) Insert an element into a binary search tree. ii)Delete an element from a binary search tree. iii)Search for a key element in a binary search tree.	K3,K4	6
6	Write a program to perform the following operations i)Insertion into an AVL-tree ii)Deletion from an AVL-tree	K3,K4	7
7	Write a programs for the implementation of BFS and DFS for a given graph.	K4	7
8	Write a programs for implementing the following searching methods: i)Linear search ii)Binary search.	K4	8
9	Write a programs for implementing the following sorting methods: i)Bubble sort ii)Selection sort iii)Insertion sort iv)Radix sort.	K4,K5	8
Course Outcome	**CO1:** Remember all the data structures	K1	
	CO2: Understand the problem and construct the algorithm	K2	
	CO3: Apply the algorithm that are relevant to the casual	K3	
	CO4: Analyze the source lines that are match up with the casual	K4	
	CO5: Evaluate the flow of execution	K5	

Learning Resources	
Text Books	1.Mark Allen Weiss, ―Data Structures and Algorithm Analysis in C++‖, PearsonEducation 2014, 4th Edition. 2.Reema Thareja, ―Data Structures Using C‖, Oxford Universities Press 2014, 2nd Edition
Reference Books	1.Thomas H.Cormen,Chales E.Leiserson,Ronald L.Rivest, Clifford Stein, ―Introduction to Algorithms‖, McGraw Hill 2009, 3rd Edition. 2.Aho, Hopcroft and Ullman, ―Data Structures and Algorithms‖, Pearson Education 2003
Website Link	1.https://www.programiz.com/dsa 2.https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

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

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M2UCSP02	DATA STRUCTURE AND ALGORITHMS LAB	DSC PRACTICAL - II	II	5	-	-	5	3	

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	M	S	S	S	S	M	S	M	S
CO3	M	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	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.A.Anusha Priya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSC03	**Microprocessor and Microcontroller**	**DSC THEORY-III**	**III**	**5**	**5**	**-**	**-**	**5**
Objective	Students able to write assembly language programs using 8085							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Microprocessor**: Organization of a Microprocessor-Based System -8085 Assembly language – 8085 programming Model-Instruction Classification-Instruction, Data Format, and Storage. Microprocessor Architecture and its operations: Microprocessor- initiated operations and Bus organization – Internal Data operations and registers - Peripheral or External initiated operations.	K1	12
II	**8085 Microprocessor Architecture**: 8085 Microprocessor Pinout and Signals –Microprocessor Communication and Bus Timings- Functional block diagram - 8085 Instruction Set and Classifications.	K2	12
III	**Code Conversion and BCD Arithmetic:** BCD to Binary and Binary to BCD conversions - Binary to ASCII and ASCII to Binary conversions - ASCII to BCD and BCD to ASCII -BCD addition and Subtraction **-** Multibyte Addition and Subtraction - Multiplication and Division.	K3	12
IV	**Interrupts:** The 8085 Interrupts – RST Instructions-TRAP- SIM instructions-8259A Programmable Interrupt Controller-Direct Memory Access (DMA) and 8257 DMA controller.	K4	12
V	**Introduction to Microcontroller**: Microcontroller Vs Microprocessor - 8051 Microcontroller architecture - 8051 pin description. Timers and Counters – Operating Modes- Control Registers. Interrupts – Interrupts in 8051 - Interrupts Control Register – Execution of interrupt. **Current Trends- Embedded Software Development Tools**	K5	12
	…… Self Study		
Course Outcome	CO1: Assess and solve the Binary concepts used in Microprocessor programming	K1	
	CO2: Understanding the 8085 instruction set and their classifications	K2	
	CO3: Applying different types of instructions to convert binary codes and analyzing the outcome.	K3	
	CO4: Analyze how peripheral devices are connected to 8085 using Interrupts and DMA controller	K4	
	CO5: Evaluate the 8051 pin diagram	K5	

Learning Resources				
Text Books	1. R. S. Gaonkar, "Microprocessor Architecture- Programming and Applications with 8085"- 6th Edition- Penram International Publications,2013. [For unit I to unit IV] 2. Soumitra Kumar Mandal ,"Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051", Tata McGraw Hill Education Private Limited. [for unit V].			
Reference Books	1. Mathur, "Introduction to Microprocessor", 3rd Edition- Tata McGraw-Hill -2014. 2. Raj Kamal, "Microcontrollers: Architecture, Programming, Interfacing and System Design‖", Pearson Education, 2005. 3. Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096", PHI, 2008			
Website Link	1. https://www.geeksforgeeks.org/architecture-of-8085-microprocessor/ 2. https://www.tutorialspoint.com/microprocessor/microcontrollers_overview.htm			
Self-Study Material	1.https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000007CS/P001072/M023188/ET/1505901416lect-36-f(1.pdf			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M3UCSC03	**Microprocessor and Microcontroller**	**DSC THEORY-III**	**III**	**5**	**5**	**-**	**-**	**5**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
M.Sudha	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSP03	**Microprocessor and Microcontroller**	**DSC PRACTICAL-III**	**III**	**5**	**-**	**-**	**5**	**3**
Objective	Students to write assembly language programs using 8085 Simulator							

S. No.	List of Experiments / Programs	Knowledge Levels	Sessions
I	**Addition and Subtraction** 1. 8 - bit addition 2. 16 - bit addition 3. 8 - bit subtraction 4. BCD subtraction	K1	10
II	**Multiplication and Division** 1. 8 - bit multiplication 2. BCD multiplication 3. 8 - bit division	K2	8
III	**Sorting and Searching** 1. Searching for an element in an array. 2. Sorting in Ascending and Descending order. 3. Finding the largest and smallest elements in an array. 4. Reversing array elements. 5. Block move.	K3	15
IV	**Code Conversion** 1. BCD to Hex and Hex to BCD 2. Binary to ASCII and ASCII to binary 3. ASCII to BCD and BCD to ASCII	K4	12
V	**Simple programs on 8051 Microcontroller** 1. Addition 2. Subtraction 3. Multiplication 4. Division 5. Interfacing Experiments using 8051 1. Realisation of Boolean Expression through ports. 2. Time delay generation using subroutines. 3. Display LEDs through ports	K5	15
Course Outcome	CO1: Remember the Basic Addition and Subtraction	K1	
	CO2: Understanding the 8085 instruction set Multiplication and Division	K2	
	CO3: Applying different types of Sorting and Searching	K3	
	CO4: Analyze the Code Conversion	K4	
	CO5: An exposure to create real time applications using microcontroller	K5	

Learning Resources	
Text Books	1. R. S. Gaonkar, "Microprocessor Architecture- Programming and Applications with 8085"- 6th Edition- Penram International Publications,2013. [For unit I to unit IV] 2. Soumitra Kumar Mandal ," Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051" , Tata McGraw Hill Education Private Limited.
Reference Books	1. Mathur, "Introduction to Microprocessor", 3rd Edition, Tata McGraw-Hill -1993. 2. Raj Kamal , "Microcontrollers: Architecture, Programming, Interfacing and System Design", Pearson Education, 2005. 3. Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096" , PHI, 2008
Website Link	1. https://www.geeksforgeeks.org/architecture-of-8085-microprocessor/ 2. https://www.tutorialspoint.com/microprocessor/microcontrollers_overview.htm

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

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M3UCSP03	Microprocessor and Microcontroller	DSC PRACTICAL-III	III	5	-	-	5	3

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
M.Sudha	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M4UCSC04	Java Programming	DSC Theory - IV	IV	5	5	-	-	5
Objective	Students acquire knowledge about object-oriented programming, programming knowledge in Core Java, AWT controls, Event Handling and Swing for GUI.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**: Review of Object Oriented concepts – History of Java – Java buzzwords – JVM architecture – Data types - Variables - Scope and life time of variables - arrays - operators – control statements - type conversion and casting - simple java program - constructors - methods - Static block - Static Data – Static Method String and String Buffer Classes.	K1-K2	12
II	**Inheritance:** Basic concepts - Types of inheritance - Member access rules - Usage of this and Super key word - Method Overloading - Method overriding - Abstract classes - Dynamic method dispatch - Usage of final keyword. **Packages:** Definition-Access Protection -Importing Packages. **Interfaces: Definition**-Implementation-Extending Interfaces. **Exception Handling:** try – catch- throw - throws **-** finally – Built-in exceptions - Creating own Exception classes.	K2-K3	12
III	**Multithreaded Programming:** Thread Class - Runnable interface – Synchronization-Using synchronized methods- Using synchronized statement- Inter thread Communication -Deadlock. **I/O Streams:** Concepts of streams - Stream classes- Byte and Character stream - Reading console Input and Writing Console output - File Handling.	K2-K3	12
IV	**AWT Controls:** The AWT class hierarchy - user interface components- Labels - Button - Text Components - Check Box - Check Box Group - Choice - List Box - Panels – Scroll Pane - Menu - Scroll Bar. Working with Frame class - Colour - Fonts and layout managers. **Event Handling:** Events - Event sources - Event Listeners - Event Delegation Model (EDM) - Handling Mouse and Keyboard Events - Adapter classes - Inner classes	K3-K4	12
V	**Swing:** Introduction to Swing - Hierarchy of swing components. Containers - Top level containers – J Frame – J Window – J Dialog – J Panel – J Button – J Toggle Button – J Check Box – J Radio Button – J Label, J Text Field – J Text Area – J List – J Combo Box – J Scroll Pane. **Current Trends:** AWT Error handling	K5	12

	…… Self Study.		
Course Outcome	**CO1:** Understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.	K1	
	CO2: Implement inheritance, packages,interfaces and exception handling of Core Java.	K2	
	CO3: Implement multi-threading and I/O Streams of Core Java	K3	
	CO4: Implement AWT and Event handling.	K4	
	CO5: Use Swing to create GUI.	K5	

Learning Resources	
Text Books	1.Herbert Schildt, Java:The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010 2.Gary Cornell, *Core Java 2 Volume I – Fundamentals,* Addison Wesley, 1999
Reference Books	1 .Kathy Sierra, Bert Bates,Trisha Gee, Head First Java, O'Rielly Publications, 3rd Edition, May 2022. 2. Y. Daniel Liang, *Introduction to Java Programming*, 7th Edition, Pearson Education India, 2009
Website Link	1.https://javabeginnerstutorial.com/core-java-tutorial 2.http://docs.oracle.com/javase/tutorial/ 3.https://www.coursera.org/
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3384696

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

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M4UCSC04	**Java Programming**	**Core**	**IV**	**5**	**5**	**-**	**-**	**5**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.A.Anusha Priya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M4UCSP04	PRACTICAL : JAVA PROGRAMMING	DSC Practical - IV	IV	5	-	-	5	3
Objective	Students can acquire knowledge about the fundamental knowledge of object-oriented programming							

EXCERCISE	Details	Knowledge Levels	Sessions
1	Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer	K1	4
2	Write a Java program to multiply two given matrices.	K1	4
3	Write a Java program that displays the number of characters, lines and words in a text.	K1	4
4	Generate random numbers between two given limits using Random class and print messages according to the range of the value generated.	K1	4
5	Write a program to do String Manipulation using Character Array and perform the following string operations: a. String length b. Finding a character at a particular position b. Concatenating two strings	K2	4
6	Write a program to perform the following string operations using String class: a. String Concatenation b. Search a substring c. To extract substring from given string	K2	4
7	Write a program to perform string operations using String Buffer class: a. Length of a string b. Reverse a string c. Delete a substring from the given string	K2,K3	4
8	Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the	K3,K4	4

	value is odd, the third thread will print the value of cube of the number.		
9	Write a threading program which uses the same method asynchronously to print the numbers 1to10 using Thread1 and to print 90 to100 using Thread2.	K4	4
10	Write a program to demonstrate the use of following exceptions. a. Arithmetic Exception b. Number Format Exception c. Array Index Out of Bound Exception d. Negative Array Size Exception	K4	4
11	Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes	K4	4
12	Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls.	K4	4
13	Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired. (Use adapter classes).	K5	4
14	Write a Java program that works as a simple calculator. Use a gridlayout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.	K5	4
15	Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with ―stop‖ or ―ready‖ or ―go‖ should appear above the buttons in a selected color. Initially there is no message shown.	K5	4
Course Outcome	**CO1:** Recall the basic Object-oriented concepts. Implement the basic constructs of Core Java.	K1	
	CO2: Understand inheritance, packages, interfaces and exception handling of Core Java.	K2	
	CO3: Apply multi-threading and I/O Streams of Core Java	K3	
	CO4: Analyze AWT and Event handling.	K4	
	CO5: Develop gui based programs	K5	

Learning Resources				
Text Books	1.Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010 2.Gary Cornell, *Core Java 2 Volume I – Fundamentals*, Addison Wesley, 1999			
Reference Books	1 . Head First Java, O'Rielly Publications 2. Y. Daniel Liang, *Introduction to Java Programming*, 7th Edition, Pearson Education India, 2010			
Website Link	1.https://www.w3schools.com/java 2. http://java.sun.com 3. http://www.afu.com/javafaq.html			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M4UCSP04	**PRACTICAL : JAVA PROGRAMMING**	**DSC Practical - IV**	**IV**	**5**	**-**	**-**	**5**	**3**	

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.A.Anusha Priya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc – Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSC05	**Software Engineering**	**DSC THEORY-V**	**V**	**5**	**5**	**-**	**-**	**5**
Objective	Students can gain basic knowledge of analysis and design of systems							

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. **Software Life Cycle Models:** Why use a life cycle model, Classical waterfall model, iterative waterfall model, prototyping model, evolutionary model, spiral model, comparison of different life cycle models.	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.**User-Interface design:** Characteristics of a good interface; basic concepts; types of user interfaces; component based GUI development, a user interface methodology.	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.**Software Reliability and Quality Management:** Software reliability; statistical testing; software quality; software quality management system; SEI capability maturity model; personal software process.	K4	12
V	**Computer Aided Software Engineering:** CASE and its scope; CASE environment; CASE support in software life cycle; other characteristics of CASE tools; towards second generation CASE tool; architecture of a CASE environment. **Software Maintenance:** Characteristic of software maintenance; software reverse engineering; software maintenance process models; estimation of maintenance cost.. **Current Trends-* The state of research on software engineering competencies: A systematic mapping study***	K5	12

	..... Self Study		
Course Outcome	CO1: Define basic knowledge of analysis and design of systems	K1	
	CO2: Understand software engineering principles and techniques	K2	
	CO3: Apply a reliable and cost-effective software system	K3	
	CO4: Analyze design 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
Website Link	1. https://www.javatpoint.com/software-engineering
Self-Study Material	1.https://www.sciencedirect.com/science/article/pii/S0164121221002648

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

B.Sc – Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSC05	**Software Engineering**	**DSC THEORY-V**	**V**	**5**	**5**	**-**	**-**	**5**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSC06	**DATABASE MANAGEMENT SYSTEM**	**DSC THEORY-VI**	**V**	**5**	**5**	**-**	**-**	**5**
Objective	Students able to learn the designing of data base systems, foundation on the relational model of data and normal forms.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Database Concepts:** Database Systems - Data vs Information - Introducing the database -File system - Problems with file system - Database systems. Data models - Importance - Basic Building Blocks - Business rules - Evolution of Data models - Degrees of Data Abstraction	K1	12
II	**Design Concepts:** Relational database model - logical view of data-keys -Integrity rules - relational set operators - data dictionary and the system catalog - relationships -data redundancy revisited - indexes - codd's rules. Entity relationship model - ER diagram	K2	12
III	**Normalization of Database Tables:** Database tables and Normalization – The Need for Normalization –The Normalization Process – Higher level Normal Form. **Introduction to SQL:** Data Definition Commands – Data Manipulation Commands – SELECT Queries – Additional Data Definition Commands – Additional SELECT Query Keywords – Joining Database Tables.	K3	12
IV	**Advanced SQL:** Relational SET Operators: UNION – UNION ALL – INTERSECT - MINUS.SQL Join Operators: Cross Join – Natural Join – Join USING Clause – JOIN ON Clause – Outer Join. Subqueries and Correlated Queries: WHERE – IN – HAVING – ANY and ALL – FROM. **SQL Functions:** Date and Time Function – Numeric Function – String Function – Conversion Function	K4	12
V	**PL/SQL:** A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Variable Declaration – Assignment operation –Arithmetic operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit Cursors, Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. **Current Trends-*Blockchain technology in the energy sector***	K5	12

	…… Self Study.		
Course Outcome	**CO1:** Tell the basic concepts of DBMS and different data models.	K1	
	CO2: Identify integrity constraints and fundamental concepts of Relational Data Models.	K2	
	CO3: Design a database schema considering normalization, relationships, and utilizing SQL and DML	K3	
	CO4: Classify various functions and join operations, and gain proficiency in handling multiple tables.	K4	
	CO5: Asses a design database operations and implement PL/SQL	K5	

Learning Resources				
Text Books	1. Coronel, Morris, Rob, "Database Systems, Design, Implementation and Management", Ninth Edition 2. Nilesh Shah, "Database Systems Using Oracle", 2nd edition, Pearson Education India, 2016			
Reference Books	1. Abraham Silberschatz, Henry F.Korth and S.Sudarshan,—Database System Concepts‖, McGraw Hill International Publication ,VI Edition 2. Shio Kumar Singh , —Database Systems —,Pearson publications ,II Edition			
Website Link	1. https://www.geeksforgeeks.org/dbms/ 2. https://www.geeksforgeeks.org/plsql-introduction/			
Self-Study Material	1. https://www.sciencedirect.com/science/article/pii/S1364032118307184 2. https://publications.jrc.ec.europa.eu/repository/handle/JRC125217 3. https://publications.jrc.ec.europa.eu/repository/handle/JRC125221			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M5UCSC06	**DATABASE MANAGEMENT SYSTEM**	**DSC THEORY-VI**	**V**	**5**	**5**	**-**	**-**	**5**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
S.Manokarthick	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M5UCSC07	Mobile Application Development	DSC THEORY-VII	V	4	4	-	-	4

Objective	Students can gain knowledge on Software Development tools for Mobile Applications

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Android Operating System-** Configuration of Android Environment-Create the FirstAndroid Application. **Layout:** Vertical, Vertical Scroll, horizontal, horizontal Scroll, Table Layout arrangement. **Designing User Interface:** Label Text - TextView - Password Text Box - Button - Image Button- CheckBox- Image - RadioButton - Slider - Autocomplete text View	K1	10
II	**User Interface:** Spinner-Switch - Side Bar-ListView - List Picker -Image Picker - Notifier-Time andDatePicker - Web Viewer	K2	08
III	**Media:** Camcorder - Camera - Player - Speech Recognizer - Text to Speech - Video Player - Canvas	K3	10
IV	**Maps:** Maps - Sensor: Location Sensor - Barcode Scanner **Social components:** Contact Picker - Email Picker - Phone Number Picker - Phone Call - Social: Texting	K4	10
V	**Storage:** Cloud DB - Tiny DB - Experimental - Fire DB. **Current Trends-* The state of research on software engineering competencies: A systematic mapping study***	K5	10
	..... Self Study		
Course Outcome	CO1: List the requirements needed for developing android application	K1	
	CO2: Identify the results by executing the application in emulator or in android device	K2	
	CO3: Apply proper interface setup, styles & themes, storing and management	K3	
	CO4: Analyze the problem and add necessary user interface components, graphics and multimedia components into the application	K4	
	CO5: Evaluate the results by implementing the concept behind the problem with proper code.	K5	

Learning Resources

Text Books	1. Karen Lang and Selim Tezel, (2022), Become an App Inventor The official guide from MIT App Inventor, Miteen Press, Walker Books Limited.
Reference Books	1. Wei - Meng Lee, (2012), Beginning Android 4 Application Development, Wiley India Edition.
Website Link	1. https://ai2.appinventor.mit.edu/reference/
Self-Study Material	1.https://www.researchgate.net/publication/352490326_A_Study_and_Overview_of_the_Mobile_App_Development_Industry

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M5UCSC07	**Mobile Application Development**	**DSC THEORY-VII**	**V**	**4**	**4**	**-**	**-**	**4**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M5UCSP05	PRACTICAL: DATABASE MANAGEMENT SYSTEM	DSC PRACTICAL -V	V	3	-	-	3	2

Objective	Students able to learn the designing of data base systems, foundation on the relational model of data and normal forms.

Unit	Course Content	Knowledge Levels	Sessions
1	DDL Commands	K1	3
2	DML Commands	K2	3
3	TCL Commands	K2	3
4	Fibonacci Series	K2	3
5	Factorial	K3	3
6	String Reverse	K3	3
7	Sum Of Series	K3	3
8	Trigger	K4	3
9	Student Mark Analysis Using Cursor	K5	4
10	Library Management system	K5	4
11	Student Mark Analysis	K5	4
Course Outcome	**CO1:** Understand basic concepts of DBMS and different data models.	K1	
	CO2: Define integrity constraints and fundamental concepts of Relational Data Models.	K2	
	CO3: Design a database schema considering normalization, relationships, and utilising SQL and DML	K3	
	CO4: Classify various functions and join operations, and gain proficiency in handling multiple tables.	K4	
	CO5: Design database operations and implement PL/SQL programs	K4	

Learning Resources

Text Books	1. Coronel, Morris, Rob, "Database Systems, Design, Implementation and Management", Ninth Edition 2. Nilesh Shah, "Database Systems Using Oracle", 2nd edition, Pearson Education India, 2016			
Reference Books	1. Abraham Silberschatz, Henry F.Korth and S.Sudarshan,—Database System Concepts‖, McGraw Hill International Publication ,VI Edition 2. Shio Kumar Singh , —Database Systems —,Pearson publications ,II Edition			
Website Link	1. https://www.studytonight.com/dbms/introduction-to-sql.php 2. https://www.tutorialspoint.com/plsql/index.htm			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M5UCSP05	**PRACTICAL: DATABASE MANAGEMENT SYSTEM**	**DSC PRACTICAL - V**	**V**	**3**	**-**	**-**	**3**	**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
S.Manokarthick	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UCSP06	MOBILE APPLICATION DEVELOPMENT	DSC PRACTICAL-VI	V	3	-	-	3	2

Objective	Students can learn how to create mobile applications		
S.No.	**List of Experiments / Programs**	**Knowledge Levels**	**Sessions**
1	Develop an application for Simple Counter	K1	3
2	Develop an application to display your personal details using GUI Components.	K1	3
3	Develop a Simple Calculator that uses radio buttons and text view.	K2	3
4	Develop an application that uses Intent and Activity.	K2,K3	3
5	Develop an application that uses Dialog Boxes.	K3	3
6	Develop an application to display a Splash Screen.	K4	3
7	Develop an application that uses Layout Managers	K3	5
8	Develop an application that uses different types of Menus	K3,K4	5
9	Develop an application that uses to send messages from one mobile to another mobile.	K4	5
10	Develop an application that uses to send E-mail. Develop an application that plays Audio and Video	K4,K5	3
Course Outcome	CO1: Chart the requirements needed for developing android application	K1	
	CO2: Identify the results by executing the application in emulator or in android device	K2	
	CO3: Apply proper interface setup, styles & themes, storing and management	K3	
	CO4: Analyze the problem and add necessary user interface components, graphics and multimedia components into the application	K4	
	CO5: Evaluate the results by implementing the concept behind the problem with proper code.	K5	

Learning Resources	
Text Books	1. Karen Lang and Selim Tezel, (2022), Become an App Inventor The official guide from MIT App Inventor, Miteen Press, Walker Books Limited.
Reference Books	1. Wei – Meng Lee, (2012), Beginning Android 4 Application Development, Wiley India Edition.
Website Link	1.https://ai2.appinventor.mit.edu/reference/ 2.https://developer.android.com/

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UCSP06	MOBILE APPLICATION DEVELOPMENT	DSC PRACTICAL-VI	V	3	-	-	3	2

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M6UCSC08	Computer Networks	DSC THEORY-VIII	VI	5	5	-	-	5

Objective	Students able to learn the basic concepts Computer network, wireless Transmission, networking and data link layer, Network communication and concept of Transport layer.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Network Hardware – Software – Reference Models – OSI and TCP/IP Models – **Example Networks:** Internet, ATM, Ethernet and Wireless LANs - Physical Layer – Theoretical Basis for Data Communication - Guided Transmission Media	K1	12
II	**Wireless Transmission** - Communication Satellites – **Telephone System:** Structure, Local Loop, Trunks and Multiplexing and Switching. **Data Link Layer:** Design Issues – Error Detection and Correction.	K2	12
III	**Elementary Data Link Protocols** - Sliding Window Protocols – Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – Bluetooth.	K3	12
IV	**Network Layer** - Design Issues - Routing Algorithms - Congestion Control Algorithms – IP Protocol - IP Addresses – Internet Control Protocols	K4	12
V	**Transport Layer - Services** - Connection Management - Addressing, Establishing and Releasing a Connection – Simple Transport Protocol – Internet Transport Protocols (ITP) - **Network Security:** Cryptography **Current Trends-*IoT Networks***	K5	12
	..... Self Study		
Course Outcome	CO1: Remember the basics of Computer Network architecture, OSI and TCP/IP reference models	K1	
	CO2: Understand the knowledge on Telephone systems using wireless network	K2	
	CO3: Apply the concept of Medium Access Control	K3	
	CO4: Analyze the characteristics of Routing and Congestion control algorithms	K4	
	CO5: Evaluate the network security and define various protocols such as FTP,HTTP, Telnet, DNS	K5	

Learning Resources				
Text Books	1. A. S. Tanenbaum,Computer Networks, 4th Edition, Prentice-Hall of India, 2008.			
Reference Books	1. B. A. Forouzan, Data Communications and Networking, Tata McGraw Hill, 4th Edition, 2017 2. F.Halsall,Data Communications,Computer Networks and Open Systems, Pearson Education, 2008 3. D. Bertsekas and R. Gallagher, Data Networks, 2nd Edition, PHI, 2008			
Website Link	1. https://en.wikipedia.org/wiki/Computer_network 2. https://citationsy.com/styles/computer-networks			
Self-Study Material	1.https://euristiq.com/types-of-iot-networks/			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSC08	**Computer Networks**		**DSC THEORY-VIII**	**VI**	**5**	**5**	**-**	**-**	**5**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Quiz
Teaching and Learning Methods	Handling classes through chalk and talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
D.Vasanthi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M6UCSC09	.Net Programming	DSC THEORY-IX	VI	5	5	-	-	5

Objective	Students can learn about ASP.NET Web application using standard controls, file handling operations, SQL Server Database using ADO.NET and Grid view control and XML classes

Unit	Course Content	Knowledge Levels	Sessions
I	**Overview of .NET framework:** Common Language Runtime (CLR) - Framework Class Library - **C# Fundamentals:** Primitive types and Variables – Operators - Conditional statements - Looping statements – Creating and using Objects – Arrays – String operations.	K1	12
II	**Introduction to ASP.NET:** IDE - Languages supported Components - Working with Web Forms – **Web form standard controls:** Properties and its events – HTML controls - **List Controls:** Properties and its events.	K2	12
III	**Rich Controls:** Properties and its events – **Validation controls:** Properties and its events – File Stream classes - File Modes – File Share – Reading and Writing to files – Creating, Moving, Copying and Deleting files – File uploading	K3	12
IV	**ADO.NET:** Overview – Database Connections – Commands – Data Reader - Data Adapter - Data Sets - Data Controls and its Properties – DataBinding	K4	12
V	**Grid View control:** Deleting, editing, Sorting and Paging - XML classes – Web form to manipulate XML files - Website Security - Authentication - Authorization – Creating aWeb application. **Current Trends-*.NET for IoT Networks***	K5	12
	…… Self Study		
Course Outcome	CO1: Remember the knowledge of C# programming constructs and the .NET Framework	K1	
	CO2: Understand the ASP.NET framework to develop a software to solve real-world problems	K2	
	CO3: Apply the various Controls Files in a application development	K3	
	CO4: Analyze the MicrosoftADO.NET for create a web application	K4	
	CO5: Evaluate the XML to develop web applications	K5	

Learning Resources	
Text Books	1. SvetlinNakov,VeselinKolev& Co, Fundamentals of Computer Programming with C#, Faber publication, 2019. 2. Mathew, Mac Donald, The Complete Reference ASP.NET, Tata McGraw-Hill,2015
Reference Books	1. Herbert Schildt, The Complete Reference C#.NET, TataMcGraw-Hill,2017. 2. Kogent Learning Solutions, C# 2012 Programming Covers .NET 4.5 Black Book, Dreamtechpres,2013 3. Anne Boehm, Joel Murach, Murach's C# 2015, Mike Murach& Associates Inc.2016 4. DenielleOtey, Michael Otey, ADO.NET: The Complete reference, McGrawHill,2008 5. Matthew MacDonald, Beginning ASP.NET 4 in C# 2010,APRESS,2010
Website Link	1. https://www.geeksforgeeks.org/introduction-to-net-framework/ 2. https://www.javatpoint.com/net-framework
Self-Study Material	1. https://www.nist.gov/internet-things-iot

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSC09	.NET Programming	DSC THEORY-IX	VI	5	5	-	-	5

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
D.Vasanthi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSP07	**PRACTICAL: .NET PROGRAMMING**	**DSC PRACTICAL - VII**	**VI**	**5**	**-**	**-**	**5**	**3**
Objective	Students can develop ASP.NET Web application using standard controls							

S.No.	List of Experiments / Programs	Knowledge Levels	Sessions
1	Create an exposure of Web applications and tools	K1	4
2	Implement the Html Controls	K2	4
3	Implement the Server Controls	K2	4
4	Web application using Web controls.	K3	4
5	Web application using List controls.	K3	4
6	Web Page design using Rich control. Validate user input using Validation controls. Working with File concepts.	K3	4
7	Web application using Data Controls.	K4	4
8	Data binding with Web controls	K4	4
9	Data binding with Data Controls.	K4	4
10	Database application to perform insert, update and delete operations.	K4	4
11	Database application using Data Controls to perform insert, delete, edit, paging and sorting operation.	K5	4
12	Implement the Xml classes.	K5	4
13	Implement Authentication – Authorization.	K5	4
14	Ticket reservation using ASP.NET controls.	K5	4
15	Online examination using ASP.NET controls.	K5	4
Course Outcome	**CO1:** Remember web applications and implement various controls.	K1	
	CO2: Understand web pages in Rich control.	K2	
	CO3: Apply knowledge about file handling operations	K3	
	CO4: Analyze ability to design XML classes	K4	
	CO5: Develop a software to solve real-world problems using ASP.NET	K5	

Learning Resources	
Text Books	1. SvetlinNakov, VeselinKolev& Co, Fundamentals of Computer Programming with C#, Faber publication,2019. 2. Mathew, Mac Donald, The Complete Reference ASP.NET, Tata McGraw-Hill,2015.
Reference Books	1.Herbert Schildt, The Complete Reference C#.NET, TataMcGraw-Hill,2017. 2. Kogent Learning Solutions, C# 2012 Programming Covers .NET 4.5 Black Book, Dreamtech pres,2013. 3. Anne Boehm, Joel Murach, Murach's C# 2015, Mike Murach& Associates Inc.2016.
Website Link	1. https://www.geeksforgeeks.org/introduction-to-net-framework/ 2. https://www.javatpoint.com/net-framework

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSP07	PRACTICAL: NET PROGRAMMING	DSC PRACTICAL - VII	VI	5	-	-	5	3

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
V.Arbutharaj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

S.NO.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	V	23M5UCSE01	DATA MINING AND WAREHOUSING
2	V	23M5UCSE02	CRYPTOGRAPHY
3	V	23M5UCSE03	CLOUD COMPUTING
4	V	23M5UCSE04	OPERATING SYSTEMS
5	V	23M5UCSE05	INTERNET OF THINGS AND ITS APPLICATIONS
6	V	23M5UCSE06	SOFTWARE PROJECT MANAGEMENT
7	VI	23M6UCSE07	VIRTUAL REALITY
8	VI	23M6UCSE08	NATURAL LANGUAGE PROCESSING
9	VI	23M6UCSE09	IMAGE PROCESSING
10	VI	23M6UCSE10	ARTIFICIAL INTELLIGENCE
11	VI	23M6UCSE11	ROBOTICS AND ITS APPLICATIONS
12	VI	23M6UCSE12	DATA SCIENCE
13	VI	23M6UHME13	APPLICATION OF COMPUTER IN HOSPITALITY INDUSTRY
14	VI	23M6UHMEP1	APPLICATION OF COMPUTERS IN HOSPITALITY INDUSTRY PRACTICAL

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE01	**DATA MINING AND WAREHOUSING**	**DSE THEORY-I**	**V**	**4**	**2**	**2**	**-**	**3**
Objective	Students can learn basic concepts and techniques of Data Mining.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Data mining application – data mining techniques - Association rules mining: basics- a naive algorithm- Apriori algorithm – improve the efficient of the Apriori algorithm – mining frequent pattern without candidate generation (FP-growth)	K1	10
II	**Classification** : Introduction – decision tree – over fitting and pruning - DT rules- Naive bayes method- estimation predictive accuracy of classification methods - other evaluation criteria for classification methods	K2	08
III	**Cluster analysis:** cluster analysis – types of data – computing distances- partitioned methods – hierarchical methods – density based methods – dealing with large databases	K3	10
IV	**Web data mining**: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining - **Search engines**: Search engines functionality- search engines architecture – ranking of web pages	K4	10
V	**Data warehousing**: Introduction- Data warehousing design - Guidelines for data warehousing implementation - Data warehousing metadata - **Online analytical processing (OLAP):** Introduction – OLAP characteristics of OLAP system – Multidimensional view and data cube - Data cube operations. **current Trends:** Real-Time Data Streaming	K5	10
	..... Self Study		
Course Outcome	**CO1:** Remember the basic concepts of data mining.	K1	
	CO2: Understanding the data mining classification	K2	
	CO3: Apply mining with clustering	K3	
	CO4: Evaluate web content mining.	K4	
	CO5: Implement data cube operations	K5	

Learning Resources	
Text Books	1.G.K.Gupta,Introduction to data mining with case studies,2nd Edition,PHI Private limited,New Delhi,2011.
Reference Books	1.Arun k Pujari-Data Mining Techniques,10th impression,University Press,2008.
Website Link	1.https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing 2.https://www.tutorialspoint.com/Data-Warehousing-and-Data-Mining
Self-Study Material	1.https://www.xenonstack.com/insights/real-time-data-streaming

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UCSE01	**DATA MINING AND WAREHOUSING**	**DSE THEORY-I**	**V**	**4**	**3**	**1**	**-**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
P.Muthamilselvi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE02	**Cryptography**	**DSE THEORY-I**	**V**	**4**	**2**	**2**	**-**	**3**
Objective	Student able to understand the fundamentals of Cryptography.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** The OSI security Architecture – Security Attacks – Security Mechanisms – Security Services – A model for network Security.	K1	08
II	**Classical Encryption Techniques:** Symmetric cipher model – **Substitution Techniques:** Caesar Cipher – Mono alphabetic cipher – Playfair cipher – Polyalphabetic Cipher – Transposition techniques – Stenography	K2	10
III	**Block Cipher and DES:** Block Cipher Principles – DES – The Strength of **DES – RSA:** The RSA algorithm.	K3	10
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	10
V	Intruders – Malicious software – Firewalls. ***current trends: Blockchain, Digital signature.***	K5	10
	…… Self Study		
Course Outcome	CO1: Recall 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: Apply the various Authentication schemes to simulate different applications.	K4	
	CO5:Evaluate various Security practices and System security standards	K5	

Learning Resources	
Text Books	1. William Stallings, —"Cryptography and Network Security Principles and Practice".
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://www.sciencedirect.com/science/article/abs/pii/0167404894900310

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

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UCSE02	Cryptography	DSE THEORY-I	V	4	2	2	-	3

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	M	M	M	M	S	M	S	M	S
CO3	M	M	M	M	M	S	S	S	M	S
CO4	M	M	M	M	S	M	S	S	S	M
CO5	L	M	M	S	S	S	S	S	S	S

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
M.Kalaisevi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE03	**Cloud Computing**	**DSE THEORY-I**	**V**	**4**	**2**	**2**	**-**	**3**
Objective	Students can learn the fundamental concepts and Technologies of Cloud Computing and Cloud Architecture and Application design.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Cloud Computing:** Definition of Cloud Computing - Characteristics of Cloud Computing – Cloud Models – Cloud Service Examples – Cloud-based Services and Applications. **Cloud Concepts and Technologies:** Virtualization – Load balancing – Scalability and Elasticity – Deployment – Replication – Monitoring – Software Defined Networking – Network Function Virtualization – MapReduce – Identity and Access Management – Service Level Agreements – Billing.	K1	10
II	**Cloud Services Compute Services:** Amazon Elastic Computer Cloud - Google Compute Engine - Windows Azure Virtual Machines **Storage Services:** Amazon Simple Storage Service - Google Cloud Storage - Windows Azure. **Storage Database Services:** Amazon Relational Data Store - Amazon Dynamo DB - Google Cloud SQL Google Cloud Data Store - Windows Azure SQL Database – Windows Azure Table Service **Application Services:** Application Runtimes and Frameworks - Queuing Services - Email Services – Notification Services - Media Services. Content Delivery Services: Amazon CloudFront - Windows Azure Content Delivery Network. **Analytics Services:** Amazon Elastic MapReduce - Google MapReduce Service - Google BigQuery - Windows Azure HDInsight **Deployment and Management Services:** Amazon Elastic Beanstack - Amazon CloudFormation **Identity and Access Management Services:** Amazon Identity and Access Management - Windows Azure Active Directory Open Source Private Cloud Software: CloudStack – Eucalyptus -OpenStack	K2	10
III	**Cloud Application Design:** Introduction – Design Consideration for Cloud Applications – Scalability – Reliability and Availability – Security – Maintenance and Upgradation – Performance – Reference Architectures for Cloud Applications. **Cloud Application Design Methodologies:** Service Oriented Architecture (SOA), Cloud Component Model, IaaS, PaaS and SaaS Services for Cloud Applications, Model View Controller (MVC), RESTful Web Services **.Data Storage Approaches:** RelationalApproach (SQL), Non-RelationalApproach (NoSQL).	K3	10

IV	**Cloud Application Benchmarking and Tuning:** Introduction to Benchmarking – Steps in Benchmarking – Workload Characteristics – Application Performance Metrics – Design Consideration for Benchmarking Methodology – Benchmarking Tools and Types of Tests– Deployment Prototyping. **Cloud Security:** Introduction – CSA Cloud Security Architecture – Authentication (SSO) – Authorization – Identity and Access Management – Data Security: Securing data atrest, securing data in motion – Key Management – Auditing.	K4	10
V	**Case Studies**: Cloud Computing for Healthcare – Cloud Computing for Energy Systems – Cloud Computing for Transportation Systems – Cloud Computing for Manufacturing Industry–Cloud Computing for Education. **Current Trends: Cloud-based smart devices.**	K5	08
	…… Self Study		
Course Outcome	CO1: Remember the fundamental concepts and Technologies in Cloud Computing.	K1	
	CO2: Able to understand various cloud service types and their uses and pitfalls.	K2	
	CO3: Apply the Cloud Architecture and Application design.	K3	
	CO4: Analysis of the various aspects of application design, benchmarking and security in the Cloud.	K4	
	CO5: Analysis of the various Case Studies in Cloud Computing.	K4	

Learning Resources	
Text Books	1.ArshdeepBahga, Vijay Madisetti, Cloud Computing – A Hands On Approach, Universities Press (India) Pvt. Ltd., 2018.
Reference Books	1.Anthony T Velte, Toby J Velte, Robert Elsenpeter, Cloud Computing: A Practical Approach, Tata McGraw-Hill, 2013. 2. Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., 2013. 3. David Crookes, Cloud Computing in Easy Steps, Tata McGraw Hill, 2015. 4. Dr. Kumar Saurabh, Cloud Computing, Wiley India, Second Edition 2012.
Website Link	1.https://en.wikipedia.org/wiki/Cloud_computing 2.https://link.springer.com/chapter/10.1007/978-3-030-34957-8_7 3.https://webobjects.cdw.com/webobjects/media/pdf/solutions/cloud-computing/121838-CDW-Cloud-Computing-Reference-Guide.pdf
Self-Study Material	1.https://medium.com/@samruddha.kumbhar18/future-of-cloud-based-smart-devices-e9e1dd5fb320

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE03	**Cloud Computing**		**DSE THEORY-I**	**V**	**4**	**2**	**2**	**-**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
M.Kalaisevi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE04	**Operating System**	**DSE THEORY-II**	**V**	**4**	**2**	**2**	**-**	**3**
Objective	Students able to learn internal operation of modern operating systems							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Definition of Operating System - OS Structures: OS Services - System Calls - Virtual Machines - **Process Management**: Process Concept - Process Scheduling - Operation on Processes - Co-operating Processes - Inter-process Communication	K1	10
II	**CPU Scheduling**: Basic Concepts - Scheduling Criteria - Scheduling Algorithms - **Process Synchronization**: The Critical Section Problem - Semaphores - Classical Problems of Synchronization - Critical Regions	K2	10
III	**Deadlocks:** System Model - Deadlock characterization – Methods for Handling Deadlocks Deadlock Prevention - Deadlock avoidance- Deadlock Detection - Recovery from Deadlock	K3	08
IV	**Storage management**: Memory management - Swapping – Contiguous Memory allocation. Paging – Segmentation – Segmentation with Paging –**Virtual memory:** Demand paging Page replacement – Thrashing. Mass-Storage Structure: Disk Structure- Disk scheduling.	K4	10
V	**File-System Interface**: File Concept-File Attributes-File Operations – Access Methods: Sequential Access – Direct Access –Directory Structure: Single-Level Directory- Two – Level Directory-Tree-Structured Directories- Introducing Shell Programming – Linux General Purpose Commands-Process Oriented Commands – Communication Oriented Commands. **Current Trends *Cloud Operating Systems***	K5	10
	…… Self Study		
Course Outcome	CO1: Remember the Outline the fundamental concepts of an OS and their respective functionality	K1	
	CO2:Understand the importance of open source operating system commands	K2	
	CO3:Identify and stimulate management activities of operating system	K3	
	CO4: Analyze the various services provided by the operating system.	K4	
	CO5: Evaluate Interpret different problems related to Process, Scheduling, Deadlock, memory and Files	K5	

Learning Resources	
Text Books	1.Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2012), —Operating System Concepts‖, 9th edition, Wiley Student Edition
Reference Books	1.Milan Milenkovic (2003), —Operating System Concepts and Design‖, McGraw Hill. 2. Andrew S. Tanenbaum, (2001), —Modern Operating Systems‖, 2nd Edition, Prentice Hall of India. 3. Deital and Deital (1990), —Introduction to Operating System‖, Pearson Education. 4. William Stallings (1997), —Operating Systems‖, Prentice Hall of India.
Website Link	1.http://www.tutorialspoint.com/operating_system/ 2.http://www.reallylinux.com/docs/files.shtml
Self-Study Material	1.http://www.tutorialspoint.com/operating_system/os_linux.htm

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UCSE04	**Operating System**	**DSE THEORY-II**	**V**	**4**	**2**	**2**	**-**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
N.Ramya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE05	**Internet of Things and its applications**	**DSE THEORY-II**	**V**	**4**	**2**	**2**	**-**	**3**
Objective	Student can analyze their performance Implement IoT applications on embedded platform							

Unit	Course Content	Knowledge Levels	Sessions
I	**IoT& Web Technology-**The Internet of Things Today-Time for Convergence- Towards the IoT Universe-Internet of Things Vision,-IoT Strategic Research and Innovation Directions-IoT Applications-Future Internet Technologies-Infrastructure-Networks and Communication-Processes-Data Management-Security-Privacy & Trust-Device Level Energy Issues-IoT Related Standardization-Recommendations on Research Topics.	K1	9
II	**M2M to IoT** – A Basic Perspective- Introduction-Some Definitions-M2M Value Chains-IoT Value Chains-An emerging industrial structure for IoT-The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview- Building an architecture-Main design principles and needed capabilities- An IoT architecture outline- standards considerations.	K2	9
III	**IoT Architecture** -State of the Art – Introduction, State of the art,-Architecture. Reference Model- Introduction-Reference Model and architecture-IoT reference Model-IoT Reference Architecture-Introduction-Functional View- Information View-Deployment and Operational View-Other Relevant architectural views.	K3	10
IV	**IoT Applications for Value Creations-** Introduction- IoT applications for industry- Future Factory Concepts-Brownfield IoT-Smart Objects- Smart Applications-Four Aspects in your Business to Master IoT-Value Creation from Big Data and Serialization- IoT for Retailing Industry- IoT For Oil and GasIndustry-Opinions on IoT Application and Value for Industry- Home Management	K4	10
V	**Internet of Things Privacy, Security and Governance -**Introduction-Overview of Governance-Privacy and Security Issues-Contribution from FP7 Projects-Security-Privacy and Trust in IoT-Data-Platforms for Smart Cities- First Steps Towards a Secure Platform-Smartie Approach.Data Aggregation for the IoT in Smart Cities-Security. **Current Trends: 5G and IoT.**	K5	10
	…… Self Study		

Course Outcome	**CO1:** Remember big data tools and its analysis techniques.				K1
	CO2: Understanding data by utilizing clustering and classification algorithms.				K2
	CO3: Apply the different mining algorithms and recommendation systems for large volumes of data.				K3
	CO4: Analyze to Perform analytics on data streams.				K4
	CO5: Evaluate NoSQL databases and management				K5
Learning Resources					
Text Books	1.Vijay Madisetti and ArshdeepBahga, ―Internet of Things: (A Hands-on Approach)‖, Universities Press (INDIA) Private Limited 2014, 1st Edition.				
Reference Books	1.Michael Miller, ―The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World‖, kindle version. 2. Francis daCosta, ―Rethinking the Internet of Things: A Scalable Approach to Connecting Everything‖, Apress Publications 2013, 1st Edition.				
Website Link	1. https://www.simplilearn.com 2. https://www.javatpoint.com 3. https://www.w3schools.com				
Self-Study Material	1.https://www.iotnewsportal.com/emerging/5g-and-iot-trends				
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**	

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE05	**Internet of Things and its Applications**		**DSE THEORY-II**	**V**	**4**	**2**	**2**	**-**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
P.Muthamilselvi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSE06	**Software Project Management**	**DSE THEORY-II**	**V**	**4**	**2**	**2**	**-**	**3**
Objective	Students able to learn importance of software project management.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Competencies** - Product Development Techniques – Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM.	K1	08
II	**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	10
III	**Tasks and Activities** - Software Size and Reuse Estimating - The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures - COCOMO: A Regression Model - COCOMO II - **SLIM:** A Mathematical Model - Organizational Planning - Project Roles and Skills Needed.	K3	10
IV	**Project Management Resource Activities** - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar.	K4	10
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. ***current trends: Software Development Lifecycle ***	K5	10
	…… Self Study		
Course Outcome	CO1: Remember the principles and concepts of project management	K1	
	CO2: Understand the train software project managers	K2	
	CO3: Apply software project management methodologies.	K3	
	CO4: Analyze the create comprehensive project plans	K4	
	CO5: Evaluate and mitigate risks associated with software development process	K5	

Learning Resources	
Text Books	1. Robert T. Futrell, Donald F. Shafer, Linda I. 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", Tata McGraw Hill 2004, 3rd Edition.
Website Link	1. Software Project Management e-resources from Digital libraries 2. www.smartworld.com/notes/software-project-management
Self-Study Material	1.https://commons.emich.edu/cgi/viewcontent.cgi?article=1588&context=honors

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

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UCSE06	Software Project Management	DSE THEORY-II	V	4	2	2	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
M.Kalaisevi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE07	**Virtual Reality**	**DSE THEORY-III**	**VI**	**5**	**3**	**2**	**-**	**3**
Objective	Students able to use its technology as a platform for real-world applications							

Unit	Course Content	Knowledge Levels	Sessions
I	**Virtual Reality:** The Three I's of VR – History – Early commercial VR Technology – Components of a VR System – **Input Devices:** Trackers – Navigation and Manipulation Interfaces – Gesture Interfaces	K1	12
II	**Output Devices:** Graphics Displays – Sound Displays – Haptic Feedback - **Computer Architecture for VR:** The Rendering Pipeline - PC Graphics Architecture - **VR Programming:** Toolkits and Scene Graphs – Traditional and Emerging Applications of VR	K2	12
III	**Augmented Reality:** Introduction – **Augmented Reality Concepts:** Working Principle of AR – Concepts related to AR - Ingredients of an Augmented Reality Experience	K3	12
IV	Augmented Reality Hardware – Augmented Reality Software – Software to create content for AR Application – Tools and Technologies	K4	12
V	**Augmented Reality Content:** Introduction - Creating Content for Visual, Audio, and other senses – Interaction in AR - **Mobile Augmented Reality:** Introduction – Augmented Reality Applications Areas - Collaborative Augmented Reality. **Current Trends-*Virtual reality in Industry***	K4	12
	…… Self Study		
Course Outcome	CO1: Remember the basic terminologies, techniques and applications of VR and AR	K1	
	CO2: Understand the different architectures and principles of VR and AR systems	K2	
	CO3: Apply the hardware and software technologies for different varieties of virtual and augmented reality applications	K3	
	CO4: Analyze and explain the behavior of VR and AR technology relates to human perception and cognition	K4	
	CO5: Evaluate the importance of VR/AR content and interactions to implement for the real-world problem	K5	

Learning Resources	
Text Books	1. Grigore C. Burdea and Philippe Coiffet, Virtual Reality Technology, Wiley Student Edition , Second Edition (Unit I: Chapter 1,2 & Unit II: Chapter 3,4,6,8 & 9) 2. Alan B. Craig(2013), Understanding Augmented Reality: Concepts and Applications(Unit III: Chapter 1, 2, Unit IV : Chapter 3, 4 & Unit V: Chapter 5,6,8) 3. Jon Peddie (2017), Augmented Reality: Where We Will All Live‖, Springer, Ist Edition(Unit IV: Chapter 7 (Tools & Technologies)
Reference Books	1. Alan Craig & William R. Sherman & Jeffrey D. Will, Morgan Kaufmann(2009), Developing Virtual Reality Applications: Foundations of Effective Design‖, Elsevier(Morgan Kaufmann Publishers) 2. Paul Mealy (2018), ―Virtual and Augmented Reality‖, Wiley
Website Link	1. http://msl.cs.uiuc.edu/vr/ 2. http://www.britannica.com/technology/virtual-reality/Living-in -virtual-worlds 3. https://mobidev.biz/blog/augmented-reality-development-guide
Self-Study Material	1.https://nlist.inflibnet.ac.in/search/Record/978-3-642-17376-9 (N-List)

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSE07	Virtual Reality	DSE THEORY-III	VI	5	3	2	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Questionnaire session
Teaching and Learning Methods	Handling classes through chalk and talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
D.Vasanthi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M6UCSE08	Natural Language Processing	DSE THEORY-III	VI	5	3	2	-	3

Objective	Students can understand approaches to syntax and semantics in NLP and learn natural language processing

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction :** Natural Language Processing tasks in syntax, semantics, and pragmatics – Issue- Applications – The role of machine learning – Probability Basics –Information theory – Collocations -N-gram Language Models – Estimating parameters and smoothing – Evaluating language models.	K1	12
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 Behaviors in Action: Establishing Agile roles – Establishing new values – Changing team philosophy.	K2	12
III	**Semantic analysis and Discourse Processing:** Semantic Analysis: Meaning Representation-Lexical Semantics- Ambiguity-Word Sense Disambiguation. **Discourse Processing:** cohesion-Reference Resolution- Discourse Coherence and Structure.	K3	12
IV	**Natural Language Generation:** Architecture of NLG Systems-Generation Tasks and Representations- Application of NLG. **Machine Translation:** Problems in Machine Translation. Characteristics of Indian Languages- Machine Translation Approaches-Translation involving Indian Languages	K4	12
V	**Information retrieval and lexical resources:** Information Retrieval: Design features of Information Retrieval Systems-Classical, Non-classical, Alternative Models of Information Retrieval – valuation Lexical Resources: WorldNet-Frame NetStemmers- POS Tagger-Research Corpora SSAS.**Current Trends: The Power of Natural Language Processing**	K5	12
	…… Self Study		
Course Outcome	CO1: Recall the fundamental concepts and techniques of natural language processing.	K1	
	CO2: Outline among the various techniques, taking into account the assumptions, strengths, and weaknesses of each	K2	
	CO3: Organize NLP methods to analyse sentiment of a text document	K3	
	CO4: Analyze large volume text data generated from a range of real-world applications.	K4	
	CO5: Develop robotic process automation to manage business processes and to increase and monitor their efficiency and effectiveness	K5	

Learning Resources	
Text Books	1. Daniel Jurafsky, James H. Martin, —Speech & language processing‖, Pearson publications. 2. Allen, James. Natural language understanding. Pearson, 1995
Reference Books	1.Pierre M. Nugues, —An Introduction to Language Processing with Perl and Prolog‖,Springer
Website Link	1.https://www.geeksforgeeks.org/natural-language-processing-overview/ 2.https://www.deeplearning.ai/resources/natural-language-processing/
Self-Study Material	3.https://hbr.org/2022/04/the-power-of-natural-language-processing

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSE08	Natural Language Processing	DSE THEORY-III	VI	5	3	2	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
N.Ramya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE09	**IMAGE PROCESSING**	**DSE THEORY -III**	**VI**	**5**	**3**	**2**	**-**	**3**
Objective	Students can learn fundamentals, of digital image processing, 2D Image transformations and various image compression techniques							

Unit	Course Content	Knowledge Levels	Sessions
I	**Digital Image Fundamentals:** Image representation - Basic relationship between pixels, Elements of DIP system -Applications of Digital Image Processing - 2D Systems - Classification of 2D Systems - Mathematical Morphology- Structuring Elements- Morphological Image Processing - 2D Convolution - 2D Convolution Through Graphical Method -2D Convolution Through Matrix Analysis	K1	12
II	**2D Image transforms:** Properties of 2D-DFT - Walsh transform - Hadamard transform- Haar transform- Discrete Cosine Transform - Karhunen- Loeve Transform -Singular Value Decomposition	K2	12
III	**Image Enhancement:** Spatial domain methods- Point processing- Intensity transformations - Histogram processing- Spatial filtering- smoothing filter- Sharpening filters - Frequency domain methods: low pass filtering, high pass Filtering- Homomorphic filter.	K3	12
IV	**Image segmentation**: Classification of Image segmentation techniques - Region approach – Clustering techniques - Segmentation based on thresholding - Edge based segmentation - Classification of edges- Edge Detection - Hough transform- Active contour.	K4	12
V	**Image Compression**: Need for compression -Redundancy- Classification of image- Compression schemes- Huffman coding- Arithmetic coding- Dictionary based compression -Transform based compression. **Current Trends**:Virtual Reality, Augmented Reality	K5	12
	…… Self Study.		
Course Outcome	**CO1:** Remember the fundamental concepts of digital image processing.	K1	
	CO2: Understand various 2D Image transformations	K2	
	CO3: Apply image enhancement processing techniques and filters	K3	
	CO4: Analyze the classification of Image segmentation techniques	K4	
	CO5: Evaluate image compression techniques	K5	

Learning Resources	
Text Books	1. S Jayaraman, S Esakkirajan, T Veerakumar, Digital image processing ,Tata McGraw Hill, 2015 2. Gonzalez Rafel C, Digital Image Processing, Pearson Education, 2009
Reference Books	1. Pratt William K , Digital Image Processing: , John Wiley,4/e,2007
Website Link	1. https://www.ijert.org/image-processing-using-web-2-0-2 2. https://dl.acm.org/doi/10.5555/559707
Self-Study Material	1.https://www.geeksforgeeks.org/virtual-reality-augmented-reality-and-mixed-reality/

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSE09	IMAGE PROCESSING	DSE THEORY –III	VI	5	3	2	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
V.Arbutharaj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE10	**Artificial Intelligence**	**DSE THEORY-IV**	**VI**	**5**	**3**	**2**	**-**	**3**

Objective	Students can learn various concepts of AI Techniques.

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and Search tree	K1	12
II	**Search Algorithms** : Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A* algorithm, Game Search	K2	12
III	**Probabilistic Reasoning** : Probability, conditional probability, Bayes Rule, Bayesian Networks- representation, construction and inference, Temporal model, hidden Markov model.	K3	12
IV	**Markov Decision process** : MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs.	K4	12
V	**Reinforcement Learning** : Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning- Q learning. **Current Trends: Automated machine learning**	K5	12
	…… Self Study		
Course Outcome	**CO1:** Understand the various concepts of AI Techniques	K1	
	CO2: Understand various Search Algorithms in AI.	K2	
	CO3: Understand probabilistic reasoning and models in AI.	K3	
	CO4: Understand Markov Decision Process.	K4	
	CO5: Understand various type of Reinforcement learning Techniques	K5	

Learning Resources	
Text Books	1.Stuart Russell and Peter Norvig, ―Artificial Intelligence: A Modern Approach‖ , 3rd Edition, Prentice Hall. 2.Elaine Rich and Kevin Knight, ―Artificial Intelligence‖, Tata McGraw Hill
Reference Books	1.Trivedi, M.C., ―A Classical Approach to Artifical Intelligence‖, Khanna Publishing House, Delhi. 2. SarojKaushik, ―Artificial Intelligence‖, Cengage Learning India, 2011 3.David Poole and Alan Mackworth, ―Artificial Intelligence: Foundations for Computational Agents‖, Cambridge University Press 2010
Website Link	1.https://github.com/dair-ai/ML-Course-Notes 2. https://web.cs.hacettepe.edu.tr/~erkut/ain311.f21/index.html
Self-Study Material	1.https://en.wikipedia.org/wiki/Automated_machine_learning

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE10	**Artificial Intelligence**		**DSE THEORY-IV**	**VI**	**5**	**3**	**2**	**-**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
P.MuthamilSelvi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M6UCSE11	Robotics and its Applications	DSE THEORY-IV	VI	5	3	2	-	3

Objective	Students can understand the robotics fundamentals and learn, students will study the concept of Path Planning, Vision systems.		
Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Introduction:** Introduction, brief history – components of robotics, classification – workspace- work-envelope – motion of robotic arm – end-effectors and its types – service robot and its application – Artificial Intelligence in Robotics.	K1	12
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 – strain gauge based force torque sensor-proximity and distance measuring sensors Kinematics of robots:Representation of joints and frames, frames transformation-homogeneous matrix- D-Hmatrix –**Forward And Inverse Kinematics:**two link planar (RR) and spherical robot (RRP). **Mobile robot Kinematics:**Differential Wheel Mobile Robot	K2	12
III	**Localization:**Self- localization and mapping-Challenges in localizations – IR based localizations –vision based localizations-Ultrasonic based localizations -GPS localization systems.	K3	12
IV	**PathPlanning:** Introduction- path planning- overview- roadmap path planning-cell decomposition path planning potential field path planning-obstacle avoidance-case studies **Vision system:** Robotic vision systems-image representation- object recognition –and categorization – depth measurement – image data compression- visual inspection – software considerations	K4	12
V	**Application:** Ariel robots – collision avoidance robots for agriculture-mining-exploration-underwater – civilian – and military applications – nuclear applications – space Applications – Industrial robots-artificial intelligence in robots – application of robots in material handling – continuous arc welding – spot welding – spray painting – assembly operation – cleaning etc. **Current Trends: Soft Robotics.**	K5	12
	…… Self Study		
Course Outcome	CO1: Learn the different physical forms of robot Architectures.	K1	
	CO2: Understand Kinematically model simple manipulator and mobile robots.	K2	
	CO3: Apply Mathematically kinematic robot system	K3	
	CO4: Analyze manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.	K4	
	CO5: Evaluate the robotics algorithms related to kinematics, control, optimization, and uncertainty.	K5	

Learning Resources	
Text Books	1. Richared D.Klafter. Thomas Achmielewski and Mickael Negin, Robotic Engineering and Integrated Approach, Prentice Hall India- New delhi -2001.
Reference Books	1. Industrial robotic technology-programming and application by M.P.Groover et.al, McGrawhill2008. 2. Robotics technology and flexible automation by S.R.Deb, THH-2009 3. Saeed B.Nikku, Introduction to robotics, analysis, control and applications, Wiley-India, 2 nd edition 2011
Website Link	1.https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_robotics.htm 2. https://www.geeksforgeeks.org/robotics-introduction/
Self-Study Material	1.https://www.bristolroboticslab.com/soft-robotics

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSE11	Robotics and its Applications	DSE THEORY-IV	VI	5	3	2	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
P.Muthamilselvi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science- Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE12	**Data Science**	**DSE THEORY-IV**	**VI**	**5**	**3**	**2**	**-**	**3**
Objective	Students can learn about the basics of Data Science, various Algorithms in Data Science and Hadoop Framework.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Introduction:** Benefits and uses – Facts of data – Data science process –Big data ecosystem and data science	K1	12
II	**The Data science Process:**Overview – research goals - retrieving data - Transformation – Exploratory Data Analysis – Model building.	K2	12
III	**Algorithms** :Machine learning algorithms – Modeling process – Types – Supervised – Unsupervised - Semi-supervised	K3	12
IV	**Introduction to Hadoop** :Hadoop framework – Spark – replacing MapReduce- NoSQL – ACID – CAP – BASE – types	K4	12
V	**Case Study:** Prediction of Disease - Setting research goals - Data retrieval – preparation - exploration - Disease profiling - presentation and automation. **Current Trends:**Auto ML	K5	12
	…… Self Study		
Course Outcome	**CO1**:Remember the basics in Data Science and Big data.	K1	
	CO2:Understand overview and building process in Data Science.	K2	
	CO3: Apply the various Algorithms in Data Science.	K3	
	CO4: Analyze Hadoop Framework in Data Science.	K4	
	CO5: Evaluate in Data Science.	K5	

Learning Resources	
Text Books	1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, ―Introducing Data Science‖, Manning Publications 2016
Reference Books	1. Roger Peng, ―The Art of Data Science‖, lulu.com 2016. 2. MurtazaHaider, ―Getting Started with Data Science – Making Sense of Data with Analytics‖, IBM press, E-book. 3. Annalyn Ng, Kenneth Soo, ―Numsense! Data Science for the Layman: No Math Added‖, 2017,1st Edition.
Website Link	1. https://www.w3schools.com/datascience 2. https://en.wikipedia.org/wiki/Data_science 3. http://www.cmap.polytechnique.fr/~lepennec/en/post/references/refs
Self-Study Material	1.https://www.automl.org/automl

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE12	**Data Science**		**DSE THEORY-IV**	**VI**	**5**	**3**	**2**	**-**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
N.Ramya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSE13	**Application of Computer in Hospitality Industry**	**DSE THEORY**	**VI**	**5**	**5**	**-**	**-**	**3**
Objective	Students able to know the Basics Computer Skills and enhance skills in Office Automation							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Computers:** Introduction to Computer: Classification, Generations, Organization, Capabilities Characteristics & Limitations, Application of Computer in Hotels, Familiarisation with Components of Computers - Hardware: Hardware elements - input, storage, processing & output devices. Block diagram of computer,.	K1	12
II	**Introduction to Computers Software:** Types of Software, System Software, Application Software, Utility Software's, Use of MS- Office.	K2	12
III	**MS Word:** Introduction to word-Formatting text and documents-Working with header and footers, foot notes-Tabs-Tables and Sorting-Menus-Mail Merge. **MS Excel:** Introduction to Excel-Rearranging worksheets-Formatting work sheets-Functions Excel chart Features-Working with Functions-Statistical-Math-Financial functions. **MS Power Point**: power point basics - editing text-Deleting slides-Working in outlines view-Using Design Templates-Adding Graphics-Adding organization Charts- Running Slide Show-Adding Special Effects.	K3	12
IV	**Internet & Applications:** Introduction to Internet: Definition of networks, concepts of web page, website and web searching (browsing). Benefits, Application, Working, Hardware and Software requirements, World Wide Web, Web Browser, URL, Search Engines, Email	K4	12
V	**Social Media Applications and Hospitality:** Introduction to Social Media, Its Role in Hospitality Promotion, Facebook - Creating Pages and Profiles, Merits/Demerits of Social Media, Linked In, Twitter and Other Social Media Applications of e-Commerce, e-Tourism, e-Business. **Current Trends:Advanced MS Excel.**	K5	12
	..... Self Study		
Course Outcome	CO1: Recall the Basic concept in computer	K1	
	CO2: Understand the concept of Software	K2	
	CO3: Apply the different options in MS Word	K3	
	CO4: Analyze the concept of Internet	K4	
	CO5: Evaluate the social media applications	K5	

Learning Resources	
Text Books	1. MS Office 2000 for every one Vikas Publishing House Pvt.Ltd.,Sanjay Saxena
Reference Books	1.Leon & Lion, Introduction to Computers, Vikas Publishing New Delhi 2. June Jamrich Parsons, Computers Concepts of7th Edition, Thomson Learning, Bombay. 3. Corner 4e, Computer Networks and Internet, Pearson Education.
Website Link	1. http://www.javapoint.com/ms%20word%20tutorial
Self-Study Material	1.https://ptgmedia.pearsoncmg.com/images/9780137544769/samplepages/9780137544769_Sample.pdf

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSE13	Application of Computer in Hospitality Industry	DSE THEORY	VI	5	5	-	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
K.Shunmugapriya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSEP1	**APPLICATION OF COMPUTERS IN HOSPITALITY INDUSTRY PRACTICAL**	**DSE PRACTICAL**	**VI**	**5**	**-**		**5**	**3**
Objective	To train the students in preparation of MS Office – Documents, Sheets & Presentations							

S.No.	List of Programs	Knowledge Levels	Sessions
1	Creating Table in MSWORD	K2	6
2	Formatting Documents and Mail merge	K2	6
3	Creating Organization Chart for a Hotel Industry.	K4	6
4	KOT, Logo, Students' Resumes in WORD	K4	6
5	KOT, Report Card, Pass / Fail Result, Bills, Hotel Rooms, Charts, Database of Employees, Guests - MS EXCEL	K3	6
6	To download information from the internet as a topic, To surf the internet and look for images or information on any relevant topic - INTERNET	K4	6
7	To download information from the internet as a topic, To surf the internet and look for images or information on any relevant topic - INTERNET. To present the above information as a presentation	K4	6
8	Updating HMS (Hotel management software) Room Occupancy, Vacant.	K5	6
9	Creating Room Occupancy Report, Reservation, Registration and Cancellation Report in HMS	K5	6
10	Creation & Updating of Social Media Pages – Safe Surfing	K5	6
Course Outcome	**CO1:** Identify the various tools used in MS Office	K1	
	CO2: Discuss different types of Excel Formulas	K2	
	CO3: Perform different types of HMS Software update	K3	
	CO4: Prepare and present various reports used in Hotel	K4	
	CO5: Analyze the different types Social media surfing safely	K5	

Learning Resources	
Text Books	1.MS office 2000 for every one- Vikas publishing House Pvt. Ltd., Sanjay Saxena
Reference Books	1.Leon & Lion, Introduction to Computers, Vikas Publishing House, New Delhi
Website Link	1.https://www.microsoft.com/en/microsoft-365/word

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

B.Sc., Computer Science Syllabus LOCF-CBCS with effective from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UCSEP1	APPLICATION OF COMPUTERS IN HOSPITALITY INDUSTRY PRACTICAL	PRACTICAL	VI	5	-	-	5	3

CO-PO Mapping

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

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

Tutorial Schedule	To give more sample programs to related topic
Teaching and Learning Methods	Handling practical session through projector
Assessment Methods	Attendance, Observation, Model practical's

Designed By	Verified By	Approved By
K.Shunmugapriya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

S.NO.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	III	23M3UCSA01	PROGRAMMING IN C
2	III	23M3UCSA02	OBJECT ORIENTED PROGRAMMING USING C++
3	III	23M3UCSAP1	PRACTICAL:PROGRAMMING IN C
4	III	23M3UCSA03	DIGITAL FASHION DESIGINING
5	IV	23M4UCSAP1	PRACTICAL:DIGITAL FASHION DESIGINING
6	IV	23M4UCSA04	PYTHON PROGRAMMING
7	IV	23M4UCSA05	MACHINE LEARNING
8	IV	23M4UCSAP2	PRACTICAL:PYTHON PROGRAMMING

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSA01	**PROGRAMMING IN C**	**GEC THEORY**	**III**	**4**	**3**	**1**	**-**	**3**
Objective	Students can learn the basic concepts of C Programming language.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Overview of C:** History of C - Importance of C - Basic structure of C programs. Constants, variables and data types: Character set - C Tokens - Keywords and identifiers - Constants - Variables - Data types - Declaration of Variables- Declaration of storage classes - Assigning values to variables - Defining symbolic constants. Operators and expression: Types of Operators - Arithmetic Expressions- Evaluation of expressions - Precedence of arithmetic operators - Type conversions in expressions - Operator precedence and associativity. Managing input and output operations: Reading and writing a character - Formatted input and output.	K1	10
II	**Decision making and branching:** Simple IF, IF-ELSE, Nesting of IF ELSE, ELSE-IF ladder, Switch statements- GOTO statements. Decision making and looping: WHILE statement - DO statement - FOR statement - Jumps in loops. Arrays: Definition & Detection - One dimensional - Two dimensional - Multi dimensional arrays - Dynamic arrays.	K2	12
III	**Character arrays and strings**: Introduction - Declaring and initializing string variables- Reading strings from terminal - Writing strings to screen - String handling functions - Table of strings. User - Defined functions: Introduction - Need for user - defined function - A Multi - function program - Elements of user - defined function - Definition of functions - Return values and their types - Function calls - Function declaration - All category of functions - Nesting of functions - Recursion - Passing arrays to functions - Passing strings to function.	K3	10
IV	**Structures and Unions:** Introduction - Defining a structure - Declaring structure variables - Accessing structure members - Structure initialization - Copying and comparing structure variables Arrays of structures - Arrays within structures -Structure within structures - Structures and functions - Unions - Size of structures - Bits fields.	K4	8
V	**Pointers:** Introduction - Understanding pointers - Accessing the address of a variable - Initializing of pointer variables. Chain of pointers - Pointer expression - Pointers and arrays - Pointers and character strings - Arrays of pointers - Pointers as function arguments - Functions returning pointers - Pointers to functions - Pointer and structures. File Management: Introduction - Defining and opening a file - Closing a file – Input/Output operation on files – Error handling during I/O operations – Random access files – Command line arguments. ***CURRENT TENDS - POINTERS***	K5	8

	..... Self Study		
Course Outcome	CO1: Recognize the Basic Terminologies of C Programming	K1	
	CO2: Understanding the statement structure and apply simple problems	K2	
	CO3: Understand and apply the pre-defined functions and user defined functions and then apply in simple problems	K3	
	CO4: Demonstrate the operation of Structures and unions.	K3	
	CO5: Recognize the operation of Files	K4	

Learning Resources	
Text Books	1. Programming in ANSI C, E. Balgurusamy Tata McGraw Hall, New Delhi, 5th Edition.
Reference Book	1. Schaum's outlines, programming with C, Byron S Gottfried, 2nd Edition. 2. Let Us C.Yashavant Kanetkar.
Website Link	1. http://www.learn-c.org/
Self-Study Material	1.https://dl.acm.org/doi/10.1145/3290380

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M3UCSA01	PROGRAMMING IN C	GEC THEORY	III	4	3	1	-	3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.P.Nandhini	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSAP1	**PROGRAMMING IN C**	**GEC PRACTICAL**	**III**	**2**		**-**	**2**	**2**

Objective	Students can create own c programs		
Unit	**Course Content**	**Knowledge Levels**	**Sessions**
1	Create a program to find the Simple Interest.	K1	3
2	Create a program to find the Arithmetic Mean and Standard Deviation.	K2	3
3	Create a program to find the Biggest value among given 3 number.	K3	3
4	Create a program to calculate the Area of perimeter of square and rectangle.	K4	3
5	Create a program to convert Binary to Decimal conversion.	K4	4
6	Create a program to convert Decimal to Binary conversion.	K5	4
7	Create a program to print the Fibonacci series using Recursion.	K5	4
8	Create a program to swap the given two integers.	K5	4
9	Create a program to print the factorial of a number.	K5	4
10	Create a program to display the multiplication table.	K5	4
	..... Self Study		
Course Outcome	CO1: Recall all the Basic Statements in C Programming	K1	
	CO2: Outline the usage of branching and looping statements.	K2	
	CO3:Apply string functions and arrays usage.	K3	
	CO4: Analysis the use of pointers and files.	K3	
	CO5: Develop programs in C	K4	

Learning Resources				
Text Books	1.Programming in ANSI C, E. Balgurusamy Tata McGraw Hall, New Delhi, 5th Edition.			
Reference Book	1. Schaum's outlines, programming with C, Byron S Gottfried, 2nd Edition. 2. Let Us C.Yashavant Kanetkar.			
Website Link	1.http://www.learn-c.org/			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M3UCSAP1	**PROGRAMMING IN C**	**GEC PRACTICAL**	**III**	**2**		**-**	**2**	**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.P.Nandhini	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. COMPUTER SCIENCE - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSA02	**Object Oriented Programming Using C++**	**GCE THEORY- I**	**III**	**4**	**4**	**-**	**-**	**4**
Objectives	Students can learn the use of various OOPs concepts							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction** to C++ - key concepts of Object-Oriented Programming - Advantages - ObjectOriented Languages - I/O in C++ - C++ Declarations. Control Structures : - Decision Makingand Statements : If ..else, jump, goto, break, continue, Switch case statements - Loops in C++ :for, while, do - functions in C++ - inline functions - Function Overloading.	K1	12
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, Hierarchal, Hybrid, Multi path inheritance - Virtual base Classes - Abstract Classes.	K3	12
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. Current Trends: OOPs concepts	K5	12
	..... Self Study		
Course Outcome	CO1:Remember the program structure of C with its syntax	K1	
	C02:Understand the programming principles in C	K2	
	CO3:Apply the programming principles learnt in real-time problems.	K3	
	CO4:Analyze the various methods of solving a problem	K4	
	CO5:Code, debug and test the programs	K5	

Learning Resources				
Text Books	1. E. Balagurusamy, ―Object-Oriented Programming with C++‖, TMH 2013, 7th Edition.			
Reference Books	1.Ashok N Kamthane, ―Object-Oriented Programming with ANSI and Turbo C++‖, Pearson Education 2003. 2.Maria Litvin& Gray Litvin, ―C++ for you‖, Vikas publication 2002.			
Website Link	1.https://alison.com/course/introduction-to-c-plus-plus-programming.			
Self-Study Material	1.https://beginnersbook.com/2017/08/cpp-oops-concepts.			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. COMPUTER SCIENCE- Syllabus LOCF – CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**		**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSA02	**Object Oriented Programming Using C++**			**GCE THEORY- I**		**III**	**4**	**4**	**-**	**-**	**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	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	M	M	M	S	M	S	S	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	M	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO				L-LOW		M- MEDIUM			S-STRONG	
Tutorial Schedule	Conducting Group Discussion, Class test									
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation									
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE									

Designed By	**Verified By**	**Approved By**
Dr.P.Nandhini	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSA03	**DIGITAL FASHION DESIGNING**	**GEC THEORY**	**III**	**3**	**3**			**3**
Objective	Students can impart skill in designing software's by means of different tools techniques							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction of digital fashion design**- Digital technology- Visual representation- Design-Demonstrate- Designing and modeling- Software and equipment.	K1	10
II	**Introduction of color management**-color combination-color theory in fashion design-primary colors - secondary colors-palettes of colors-composition.	K2	10
III	**Introduction to Adobe Illustrator**-Working with Documents-Drawing and Transforming Objects-Making and Saving Selections-Working with Shapes and Objects-Working with Color-Gradients, Pattern Fills, and Blends-Points and Paths-Working with Paths-Working with Layers-Working with Type-Drawing and Painting-Illustrator Effects-Symbols-Outputting Your Work.	K3	13
IV	**Getting Acquainted with Photoshop**- The Photoshop Environment-Basic Image Manipulation- Bitmap Images-Color Basics-Color Modes and Models-Painting Tools-Painting Tools-Brush Settings-Using the Brushes Palette-Making Selections-Selection Basics Filling and Stroking-Layers. Typographic design-vector drawing Techniques-creating roll over visuals-portfolio assignment	K4	13
V	**Adobe In Design** - Introduction to the workspace – Getting to know in Design – Setting up Document and working with pages – Working with objects – Flowing text – Editing text – Working the Typography – Working with color – Working with styles – Importing and modifying graphics – Creating Tables – Working with Transparency – Printing and Exporting – Creating Adobe PDF document with form field – Exporting for e-readers – Working with long documents. **Current Trends*3D Clothing Design***	K5	14
	…… Self Study		
Course Outcome	**CO1:** Remember Fashion Accessories and Illustrate	K1	
	CO2: Understand the color categories and color palettes	K2	
	CO3: Apply the fashion illustration using designing software	K3	
	CO4: Apply the techniques of digital image capture	K3	
	CO5: Evaluate the page creation and working with type	K3	

Learning Resources	
Text Books	1. Harriet Posner, "Marketing Fashion", Strategy, Branding and Promotion, Laurence King Publishing; 2nd edition, 2015 2. Clare Harris, "The Fundamentals of Digital Fashion Marketing", Bloomsbury Publishing Plc, 2017
Reference Books	1. Susan Lazear, "Adobe Illustrator for Fashion Design", Pearson, 2011. 2. Susan Lazear, "Adobe Photoshop for Fashion Design", Pearson, 2007.

Website Link	1.https://onlinecourses.nptel.ac.in/noc20_de01/preview
Self-Study Material	1.https://www.upwork.com/services/fashion-design/3d-clothing-design 2. https://www.adobe.com/uk/products/substance3d/discover/3d-in-fashion.html

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

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M3UCSA03	DIGITAL FASHION DESIGNING	GEC THEORY	III	3	3			3

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Mrs.E.Jamuna	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSAP1	**PRACTICAL - DIGITAL FASHION DESIGNING**	**GEC PRACTICAL**	**IV**	**4**	**_**	**_**	**4**	**3**
Objective	students can improve skill in designing software's by means of different tools techniques							

S.No.	List of Experiments / Programs	Knowledge Levels	Sessions
1	Write a program to Develop the Dress Modeling	K1	5
2	Write a program to Develop the Jewelry Modeling	K2	5
3	Write a program to develop the texturing and coloring	K2	5
4	Write a program to Develop the Making portfolio	K3	5
5	Write a program to Develop the Making typography	K4	5
6	Write a program to Develop the Create magazines	K5	5
Course Outcome	**CO1:** Remember the suitable designing software	K1	
	CO2: Understand the Fashion Accessories and Illustrate	K2	
	CO3: Apply the illustration styles	K3	
	CO4: Analyze the model that have been generated	K4	
	CO5: Evaluate the woven and printed patterns	K5	

Text Books	1. Harriet Posner," Marketing Fashion", Strategy, Branding and Promotion, Laurence King Publishing; 2nd edition, 2015 2. Clare Harris, "The Fundamentals of Digital Fashion Marketing", Bloomsbury Publishing Plc, 2017
Reference Books	1. Susan Lazear, "Adobe Illustrator for Fashion Design", Pearson, 2011. 2. Susan Lazear, "Adobe Photoshop for Fashion Design", Pearson, 2007
Website Link	1.https://onlinecourses.nptel.ac.in/noc20_de01/preview

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSAP1	**PRACTICAL - DIGITAL FASHION DESIGNING**	**GEC PRACTICAL**	**IV**	**4**	**–**	**–**	**4**	**3**

CO-PO Mapping

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

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

Tutorial Schedule	To give more sample programs to related topic
Teaching and Learning Methods	Handling practical session through projector
Assessment Methods	Attendance, Observation, Model practical's

Designed By	**Verified By**	**Approved By**
E.Jamuna	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. COMPUTER SCIENCE - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSA04	**Python Programming**	**GCE THEORY-IV**	**IV**	**4**	**4**	**-**	**-**	**3**
Objective	Students can understand the concepts of python programming and apply the OOPs concept							

Unit	Course Content	Knowledge Levels	Sessions
I	**Basics of Python Programming**: History of Python-Features of Python-Literal Constants-Variables - Identifiers-Keywords-Built-in Data Types-Output Statements – Input Statements-Comments – Indentation- Operators-ExpressionsType conversions. **Python Arrays:** Defining and Processing Arrays – Array methods.	K1	12
II	**Control Statements:** Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements.	K2	12
III	**Functions:** Function Definition – Function Call – Variable Scope and its LifetimeReturn Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments-Recursion. Python Strings: String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules.	K3	12
IV	**Lists:** Creating a list -Access values in List-Updating values in Lists-Nested lists - Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples- Difference between lists and tuples.-Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.	K4	12
V	**Python File Handling:** Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods – File Positions- Renaming and deleting files	K5	12
	…… Self Study		
Course Outcome	CO1:Learn the basics of python, Do simple programs on python, Learn how to use an array.	K1	
	CO2:Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	K2	
	CO3:Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	K3	
	CO4:Work with List, tuples and dictionary, Write program using list, tuples anddictionary.	K4	
	CO5:Usage of File handlings in python, Concept of reading and writing files, Do programs using files.	K5	

Learning Resources				
Text Books	1. ReemaThareja, ―Python Programming using problem solving approach‖, First Edition, 2017, Oxford University Press. 2 Dr. R. NageswaraRao, ―Core Python Programming‖, First Edition, 2017, Dream tech Publishers.			
Reference Books	1. VamsiKurama, ―Python Programming: A Modern Approach‖, Pearson Education. 2. Mark Lutz, ‖Learning Python‖, Orielly. 3. Adam Stewarts, ―Python Programming‖, Online. 4. Fabio Nelli, ―Python Data Analytics‖, APress. 5. Kenneth A. Lambert, ―Fundamentals of Python – First Programs‖, CENGAGE Publication			
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/			
Self-Study Material	1.https://www.programiz.com/python-programming 2.https://www.guru99.com/python-tutorials.html			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. COMPUTER SCIENCE- Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M4UCSA04	**Python Programming**	**GCE THEORY-II**	**IV**	**4**	**4**	**-**	**-**	**3**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.P.Nandhini	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. COMPUTER SCIENCE - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSA05	**Machine Learning**	**GCE THEORY-II**	**IV**	**4**	**4**	**-**	**-**	**3**

Objective	Students can learn about Machine Intelligence and Machine Learning applications.		
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-Knearest neighbour, support vector machines.	K1	10
II	**Neural networks and genetic algorithms** Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.	K2	10
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	10
IV	**Instant based learning** : K- Nearest Neighbour Learning – Locally weighted Regression – Radial Basis Functions – Case Based Learning.	K4	10
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: Machine Learning**	K5	08
	…… Self Study		
Course Outcome	CO1:Remember the importance of visualization in the data analytics solution.	K1	
	CO2:Understand structured thinking to unstructured problems.	K2	
	CO3:Apply a very broad collection of machine learning algorithms and Problems.	K3	
	CO4:Analyze algorithmic topics of machine learning and mathematically deep enough to introduce the required theory.	K4	
	CO5:Evaluate 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. Goodfellow, and Aaron Courville. "Deep learning" 2015, MIT Press		

Reference Books	1. EthemAlpaydin, —Introduction to Machine Learning (Adaptive Computation and MachineLearning), The MIT Press 2004. 2. Stephen Marsland, —Machine Learning: An Algorithmic Perspective, CRC Press, 2009.
Website Link	1.https://faculty.ucmerced.edu/mcarreira-perpinan/teaching/CSE176/lecturenotes.pdf 2.https://www.geeksforgeeks.org/machine-learning/
Self-Study Material	1.https://www.aec.edu.in/aec/Instruction_Material/ML%20UNIT-1%20NOTES.pdf

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

B.Sc. COMPUTER SCIENCE- Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M4UCSA05	Machine Learning	GCE THEORY-II	IV	4	4	-	-	5

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
Dr.P.Nandhini	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSAP2	**PRACTICAL: Python Programming**	**GEC PRACTICAL - III**	**IV**	**2**	**-**	**-**	**2**	**2**
Objective	Students able to design and program Python applications.							

S.No.	List of Experiments / Programs	Knowledge Levels	Sessions
1	Program using variables, constants, I/O statements in Python.	K1	3
2	Program using Operators in Python.	K1	3
3	Program using Conditional Statements.	K1	3
4	Program using Loops.	K1	3
5	Program using Jump Statements.	K2	3
6	Program using Functions.	K2	3
7	Program using Recursion.	K2	3
8	Program using Arrays.	K3	3
9	Program using Strings.	K3	3
10	Program using Modules.	K3	3
11	Program using Lists.	K3	3
12	Program using Tuples.	K3	3
13	Program using Dictionaries.	K3	3
14	Program for File Handling.	K3	6
Course Outcome	CO1:Remember the syntax and semantics of PYTHON language.	K1	
	CO2:Identify the problem and solve using PYTHON programming techniques.	K2	
	CO3:Apply suitable programming constructs for problem solving.	K3	
	CO4:Analyze various concepts of PYTHON language to solve the problem in an efficient way.	K4	
	CO5:Develop a PYTHON program for a given problem and test for its correctness.	K5	

Learning Resources	
Text Books	1. ReemaThareja, ―Python Programming using problem solving approach‖, First Edition, 2017, Oxford University Press. 2 Dr. R. NageswaraRao, ―Core Python Programming‖, First Edition, 2017, Dream tech Publishers.
Reference Books	1. VamsiKurama, ―Python Programming: A Modern Approach‖, Pearson Education. 2. Mark Lutz, ‖Learning Python‖, Orielly. 3. Adam Stewarts, ―Python Programming‖, Online. 4. Fabio Nelli, ―Python Data Analytics‖, APress. 5. Kenneth A. Lambert, ―Fundamentals of Python – First Programs‖, CENGAGE Publication.
Website Link	1.https://www.programiz.com/python-programming 2.https://www.guru99.com/python-tutorials.html

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

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M4UCSAP2	PRACTICAL: Python Programming	GEC PRACTICAL - III	IV	2	-	-	2	2

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
Mrs.E.Jamuna	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

S.NO.	COURSE_CODE	TITLE OF THE COURSE
1	23M2UCSSP1	HTML PROGRAMMING(SEC PRACTICAL)
2	23M3UCSSP2	PHP PROGRAMMING(SEC PRACTICAL)
3	23M4UCSSP3	MULTIMEDIA SYSTEMS(SEC PRACTICAL)
4	23M_UCSS01/ 23M_UCSN01	FUNDAMENTALS OF INFORMATION TECHNOLOGY
5	23M_UCSS02/ 23M_UCSN04	ADVANCED EXCEL
6	23M_UCSN02	INTRODUCTION TO HTML
7	23M_UCSS03/ 23M_UCSN03	OFFICE AUTOMATION
8	23M_UCSS04/ 23M_UCSN08	SOFTWARE TESTING
9	23M_UCSN05	PHP PROGRAMMING
10	23M_UCSN06	WEB DESIGNING
11	23M_UCSN07	MULTIMEDIA SYSTEMS
12	23M_UCSS05/ 23M_UCSN13	UNDERSTANDING INTERNET
13	23M_UCSS06/ 23M_UCSN09	BIOMETRICS
14	23M_UCSS07/ 23M_UCSN10	CYBER FORENSICS
15	23M_UCSS08/ 23M_UCSN11	PATTERN RECOGNITION
16	23M_UCSS09/ 23M_UCSN12	SIMULATION AND MODELLING
17	23M3UCSS10	DATABASE MANAGEMENT SYSTEMS
18	23M3UCSS11	INTERNET AND WEB TECHNOLOGY
19	23M3UCSS12	LINUX ESSENTIALS

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UCSSP1	**HTML PROGRAMMING**	**SEC PRACTICAL- I**	**II**	**2**	**-**		**2**	**2**
Objective	Students can understand the concepts of html							

S.No.	List of Programs	Knowledge Levels	Sessions
1	Write HTML code to develop a web page that contains the different background and foreground color, with various styles.	K2	3
2	Write HTML code to create a Webpage that contains an Image at its left hand side of the page when user clicks on the image; it should open another web page that displays the details of that image.	K2	3
3	Create a web Page using HREF tag having the attribute ALINK, VLINK etc.	K4	3
4	Create a web page, when user clicks on the link it should go to the bottom of the page	K4	3
5	Write a HTML code to create a web page of pink color and display moving message in red color	K3	3
6	Create a web page, showing an ordered list of name of your five friends and unordered list of any five your hobbies.	K4	3
7	Create a HTML document containing a nested list showing the content page of any book.	K4	3
8	Create a student mark list in HTML using Tables.	K4	3
Course Outcome	**CO1:** Understand the real time datasets for analysis	K1	
	CO2: Remember suitable preprocessing for data mining task	K2	
	CO3: Applu data-mining techniques based on the different applications	K3	
	CO4: Analyze the performance evaluation of various data mining algorithms	K4	
	CO5: Evaluate appropriate data models for data mining techniques to solve real world problems	K5	

Learning Resources	
Text Books	1.C Xavier, "World Wide Web with HTML", Tata McGraw Hill Education, 2000.
Reference Books	2.Raj Kamal, "Internet and Web Technologies", 7th Reprint, Tata McGraw Hill Education, 2007.
Website Link	1.https://www.w3schools.com/html/html_examples.asp

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

B.Sc., Computer Science Syllabus LOCF-CBCS with effective from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M2UCSSP1	HTML PROGRAMMING	SEC PRACTICAL I	II	2	-	-	2	2

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
M.Sudha	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF-CBCS with effect from 2023-2024 onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSSP2	PHP PROGRAMMING	SEC PRACTICAL - II	III	2	-	-	2	2
Objective	Students can design and develop dynamic web applications and learn the necessary concepts for working with the files using PHP.							

S. No.	**List of Experiments / Programs**	**Knowledge Levels**	**Sessions**
1	Write a PHP program to Get name of the user from a form and show greeting text	K1	2
2	Write a PHP program to check whether given number is palindrome or not using control structure	K2	2
3	Construct a PHP program using looping statements	K3	2
4	Construct a PHP program to Array manipulation	K3	2
5	Write a PHP program using display factorial value using Recursive Function	K2	2
6	Write a PHP program to sorts the elements of a numerical array in Ascending order and Descending order	K3	3
7	Write a PHP program to perform various string manipulation operations	K3	2
8	Create a PHP program to Write a file and Read from existing file	K4	3
9	Create a PHP program Hit Counter using Cookies	K4	3
10	Design the Curriculum Vitae using PHP program	K5	3
Course Outcome	CO1: Remember all the basic HTML and PHP tags	K1	
	CO2: Understand the problem and construct the code	K2	
	CO3: Apply the Program using the concept of array	K3	
	CO4: Analyze PHP programs that use various library functions	K4	
	CO5: Evaluate the Manipulation of files and directories	K5	

Learning Resources	
Text Books	1. Lynn mighley 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
Website Link	1. https://www.w3schools.com/php/default.asp 2. https://www.freecodecamp.org/news/the-best-php-examples/

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSSP2	**PHP Programming**	**SEC PRACTICAL - II**	**III**	**2**	**-**	**-**	**2**	**2**

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
M.Sudha	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSSP3	**Multimedia Systems**	**SEC Practical III**	**IV**	**2**	**-**	**-**	**2**	**2**
Objective	Student can acquire knowledge about the basics of multimedia, image editing and animation techniques, Apply multimedia concepts to real world projects							

S.NO	List of Experiments / Programs	Knowledge Levels	Sessions
I	GIMP's Tools- Taking Advantage of Paths - Working with Layers and masks - Using Channels Exercises: 1. Enlarge a Logo using path 2. Create an ink drawing using path 3. Replace Background of image using Channels	K1	4
II	Manipulating Images: Transforming Images - Using The Image Tools - Adjusting Colors - Working with Text - Painting in Gimp: Creating new brushes - Enhancing Photos - Exploring Filters and Effects. Exercises: 1. Design Front Cover for a Book. 2. Create a Customized logo 3. Use clone tool to remove text from an image 4. Remove Red eye using Filter.	K2	5
III	Using GIMP animation package - Managing the Frames of Image Sequence with GAP - Morphing - onion skinning - Creating a Storyboard. Exercises: 1. Morphing - Create smooth transitions from one image to another. 2. Create a Story board for your project	K3	5
IV	Flash: Introduction - Creating and Editing Objects - Color and Text. Animations: Frame- by- frame animation-Motion Tweening- Motion Guides 1. Creating Frame-by-frame Animation 2. Create a Motion Tween for Graphic and Text Object 3. Create a Motion guide Layer	K4	5
V	Shape Tweening - Masking - Interactivity: Adding Script to Buttons - Testing and Publishing. Exercises: 1. Create a Shape Tween for Graphic Object 2. Create a Mask Layer 3. Adding buttons with Action Script	K5	5

Course Outcome	**CO1:** Demonstrate understanding and use of multimedia fundamentals				K1
	CO2: Implement appropriate techniques required for editing images and designing animated system				K2
	CO3: Solve various design and implementation issues materialize on the development of multimedia systems				K3
	CO4: Assess different Photo Editing, Video Editing and animation tools and select the appropriate tool based on the requirements				K4
	CO5: Design and develop Multimedia Projects				K5
Learning Resources					
Text Books	1. Jason Van Gumster& Robert Shimonski (2010), —GIMP Bible‖, Wiley, 2nd edition. 2. Chris Gover, 2010, —Flash CS5: The missing Manual‖, 1st Edition, O" Reilly India.				
Reference Books	1.Juan Manuel Ferreyra (2011), —GIMP 2.6 Cookbook‖, PACK publishing Ltd. 2. Robert Reinhard (2003), —Macromedia Flash MX Bible‖, Wiley Dreamtech India Pvt Ltd.				
Website Link	1. https://www.youtube.com/watch?v=T8NIK3RdoIc (Unit IV: Gimp Video Editing) 2. https://www.youtube.com/watch?v=Jz9WrbELGYA				
	L-Lecture	T-Tutorial	P-Practical	C-Credit	

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSSP3	**Practical: Multimedia Systems**	**SEC Practical III**	**IV**	**2**	**-**	**-**	**2**	**2**

CO-PO Mapping

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

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

Tutorial Schedule	Give more sample programs to related topic
Teaching and Learning Methods	Handling Practical Session through projector
Assessment Methods	Attendance, Observation, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
Dr.A.Anusha Priya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS01/ 23M_UCSN01	**Fundamentals of Information Technology**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students able to learn the Understand basic concepts and terminology of information technology.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to Computers:** Introduction, Definition, .Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer	K1	4
II	**Basic Computer Organization:** Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers.	K2	5
III	**Storage Fundamentals:** Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives	K3	5
IV	**Software:** Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spreadsheet Presentation, Graphics, DBMS s/w	K4	5
V	**Operating System:** Functions, Measuring System Performance, Assemblers, Compilers and Interpreters.Batch Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux. **Current Trends-*Internet of Thing (IoT)***	K5	5
	…… Self Study.		
Course Outcome	**CO1:** Learn computer basics and essential components	K1	
	CO2: Describe an organizational structure for current input and output devices.	K2	
	CO3: Relate data storage in computers, focusing on RAM and ROM, including various types of ROM and storage advancements.	K3	
	CO4: Analyze with various software and applications.	K4	
	CO5: Apply the role of operating systems in information technology, acting as intermediaries between software and hardware.	K5	

Learning Resources				
Text Books	1. Anoop Mathew, S. KavithaMurugeshan (2009), — Fundamental of Information Technology‖, Majestic Books. 2. Alexis Leon, Mathews Leon,‖ Fundamental of Information Technology‖, 2nd Edition 3.S. K Bansal, —Fundamental of Information Technology.			
Reference Books	1. BhardwajSushilPuneet Kumar, —Fundamental of Information Technology 2. GG WILKINSON, —Fundamentals of Information Technology, Wiley-Blackwell 3. A Ravichandran , —Fundamentals of Information Technology‖, Khanna Book Publishing			
Website Link	1. https://testbook.com/computer-awareness/computer-fundamentals 2. https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html 3. https://www.tutorialspoint.com/computer_fundamentals/index.htm			
Self-Study Material	1. https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/ 2. https://www.techtarget.com/iotagenda/definition/Internet-of-Things-IoT			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS01/ 23M_UCSN01	**Fundamentals of Information Technology**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

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

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

Tutorial Schedule	To give more sample programs to related topic
Teaching and Learning Methods	Handling practical session through projector
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
S.Manokarthick	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS02/ 23M_UCSN04	**Advanced Excel**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students learn about how to Handle large amounts of data by aggregating numeric data into categories and subcategories, filtering, sorting, grouping data, and creating pivot tables to consolidate data							

Unit	Course Content	Knowledge Levels	Sessions
I	**Basics of Excel** - Customizing common options- Absolute and relative cells- Protecting and unprotecting 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	4
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 a template- templates for standardization of worksheets - Sorting and Filtering Data - Sorting tables- multiple-level sorting- custom sortingFiltering data for selected view - advanced filter optionsWorking with Reports Creating subtotals- Multiple-level subtotal	K1-K2	5
III	**Creating Pivot tables Formatting and customizing** Pivot tables- advanced options of Pivot tables- Pivot chartsConsolidating 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 FieldViewing Subtotal under Pivot- Creating Slicers.	K2-K3	5
IV	**More Functions Date and time functions-** Text functionsDatabase 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	K3	5
V	**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 TENDS - Macros In Excel **	K3	5
	..... Self Study		

Course Outcome		
	CO1: Work with big data tools and its analysis techniques.	K1
	CO2: Analyze data by utilizing clustering and classification algorithms.	K2
	CO3: Learn and apply different mining algorithms and recommendation systems for large volumes of data.	K3
	CO4: Perform analytics on data streams	K3
	CO5: Learn No-SQL databases and management.	K3

Learning Resources				
Text Books	1. Excel 2019 All 2. TMicrosoft Excel 2019 Pivot Table Data Crunching			
Reference Books	1.Excel 2019 All-in-One for Dummies, Greg Harvey, 1st edition			
Website Link	1. https://www.tutorialspoint.com/advanced_excel/index.htm			
Self-Study Material	1. https://www.geeksforgeeks.org/macros-in-excel/ 2. https://www.tutorialspoint.com/excel_macros/index.htm			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS02/ 23M_UCSN04	**Advanced Excel**			**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
CO-PO Mapping										
CO Number	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	M	M	M	M	S	S	M	S	S
CO2	S	S	M	M	M	S	M	M	S	S
CO3	M	M	M	S	S	S	S	M	S	S
CO4	M	M	S	S	S	S	M	M	S	S
CO5	M	S	S	M	S	S	S	M	S	S
Level of Correlation between CO and PO				L-LOW		M- MEDIUM			S-STRONG	
Tutorial Schedule				Conducting Group Discussion, Class test						
Teaching and Learning Methods				Handling classes through chalk & talk method, PPT presentation						
Assessment Methods				Attendance, Assignment, CIA I, CIA II and ESE						
Designed By				**Verified By**			**Approved By**			
S.Manokarthick				HOD Mr.P.Subramaniam			Member Secretary Dr.S.Shahitha			

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSN02	**Introduction to HTML**	**NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students able to learn the web page layout by incorporating a graphic, hyperlink, table, and an ordered list.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Introduction :**Web Basics: What is Internet - Web browsers - What is Web page - HTML Basics: Understanding tags.	K1	4
II	**Tags 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	5
III	**Lists:** Types of lists: Ordered, Unordered - Nesting Lists - Other tags: Marquee, HR, BR- Using Images - Creating Hyperlinks.	K3	5
IV	**Tables:** Creating basic Table, Table elements, Caption - Table and cell Alignment - Row span, Colspan - Cell padding.	K4	5
V	**Frames:** Frameset - Targeted Links - No frame - Forms : Input, Textarea, Select, Option .***CURRENT TENDS - BOOTSTRAP****	K5	5
	…… Self Study		
Course Outcome	CO1: Recognize the basic concept in HTML.	K1	
	CO2: Discuss the design concept	K2	
	CO3: Apply page formatting.	K3	
	CO4: Analyze the concept of creating links to email addresses.	K4	
	CO5: Design a customized table layout to display data effectively.	K5	

Learning Resources	
Text Books	1. Mastering HTML5 and CSS3 Made Easyll, TeachUComp Inc., 2014. 2. Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS"
Website Link	1. https://www.w3schools.com/html/default.asp 2. https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
Self-Study Material	1. https://getbootstrap.com/ 2. https://www.w3schools.com/bootstrap/default.asp

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

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M_UCSN02	**Introduction to HTML**	**NMEC**		**2**	**2**	**-**	**-**	**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
S.Manokarthick	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS03/ 23M_UCSN03	OFFICE AUTOMATION	SEC/NMEC		2	2			2
Objective	Students can understand the basics of office automation.							

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 text and 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 datafiles; Understanding Programming environment in DBMS; Developing menu drive applications inquery language(MS-Access).	K4	6
V	**Power point:** Introduction to Power point - Features - Understanding slide type casting &viewing slides - creating slide shows. Applying special object - including objects & pictures - Slide transition - Animation effects,audio inclusion,timers. current Trends: Mobile-First Approach to Office Automation	K5	6
	…… Self Study		
Course Outcome	CO1:Possess the knowledge on the basics of computers and its components	K1	
	CO2:Gain knowledge on Creating Documents, spreadsheet and presentation	K2	
	CO3: Learn the concepts of Database and implement the Query in Database.	K3	
	CO4: Demonstrate the understanding of different automation tools.	K4	
	CO5: Utilize the automation tools for documentation, calculation and presentation purpose.	K5	

Learning Resources				
Text Books	1. PeterNorton,—IntroductiontoComputers‖-TataMcGraw-Hill.			
Reference Books	1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, —Microsoft 2003‖, Tata McGrawHill.			
Website Link	1.https://www.udemy.com/course/office-automation-certificate-course/			
Self-Study Material	1.https://www.verifiedmarketreports.com/blog/top-7-trends-in-office-automation/			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M_UCSS03/ 23M_UCSN03	**OFFICE AUTOMATION**	**SEC/NMEC**		**2**	**2**			**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS04/ 23M_UCSN08	**SOFTWARE TESTING**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students able to 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:** Machine Learning	k5	6
	…… Self Study	k2	6
Course Outcome	CO1: Students learn to apply software testing knowledge and engineering methods	K1	
	CO2: Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automationL	K2	
	CO3: Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.	K3	
	CO4: Have basic understanding and knowledge of contemporary issues in software testing, such as component-based software testing problems	K4	
	CO5: Have an ability to use software testing methods and modern software testing tools for their testing projects.	K5	

Learning Resources	
Text Books	1.B.Beizer,—SoftwareTestingTechniques‖,IIEdn.,DreamTechIndia,NewDelhi, 2003 2.K.V.K.Prasad,—SoftwareTestingTools‖,DreamTech.India,NewDelhi,2005
Reference Books	1.I.Burnstein,2003,—PracticalSoftwareTesting‖,SpringerInternationalEdn. 2.R. Rajani,andP.P.Oak,2004,—SoftwareTesting‖,TataMcgrawHill,New Delhi.
Website Link	1. https://www.javatpoint.com/software-testing-tutorial 2. https://www.guru99.com/software-testing.html
Self-Study Material	1. https://www.javatpoint.com/machine-learning

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M_UCSS04/ 23M_UCSN08	Software Testing	SEC/NMEC		2	2	-	-	2

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSN05	**PHP Programming**	**NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students can learn the fundamental knowledge of PHP, design and construct dynamic, database-driven web applications							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to PHP** - Basic Knowledge of websites -Introduction of Dynamic Website -Introduction to PHP -Scope of PHP -XAMPP and WAMP Installation.	K1	4
II	**PHP Programming Basics** -Syntax of PHP -Embedding PHP in HTML - Embedding HTML in PHP. Introduction to PHP Variable -Understanding Data Types -Using Operators - Using Conditional Statements -If(), else if() and else if condition Statement.	K2	5
III	**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	5
IV	**PHP Advanced Concepts** -Reading and Writing Files -Reading Data from a File.	K4	5
V	**Managing Sessions and Using Session Variables** -Destroying a Session -Storing Data in Cookies -Setting Cookies. **Current Trends *Zend Framework ***	K5	5
	..... Self Study		
Course Outcome	CO1: Recall PHP syntax for handling HTML forms	K1	
	CO2: Interpret regular expression modifiers, operators	K2	
	CO3: Apply array concepts to create PHP programs that manipulate data effectively.	K3	
	CO4: Implement PHP programs using various PHP library functions to achieve specific tasks.	K4	
	CO5: Develop PHP scripts to manipulate files and directories, such as reading, writing, and managing file system operations.	K5	

Learning Resources				
Text Books	1. Head First PHP & MySQL: A Brain-Friendly Guide- 2009-Lynn mighley and Michael Morrison. 2. The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL- Alan Forbes.			
Reference Books	1. PHP: The Complete Reference-Steven Holzner. 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/php/default.asp 2.https://www.javatpoint.com/php-tutorial			
Self-Study Material	1.https://www.tutorialspoint.com/zend_framework/zend_framework_introduction.htm 2.https://framework.zend.com/manual/1.12/en/learning.quickstart.intro.html			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M_UCSN05	**PHP Programming**	**NMEC**		**2**	**2**	**-**	**-**	**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
S.Manokarthick	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSN06	**WEB DESIGNING**	**NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students can understand and apply XML and DHTML concepts							

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	4
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	5
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	5
IV	**MDynamic HTML:** Document object model (DCOM)- Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding. JavaScript: Client-side scripting, What is JavaScript, How to develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition,	K4	5
V	Advance script, JavaScript and objects, JavaScript own objects, the DOM and web browser environments, forms and validations. ***CURRENT TENDS - React JS***	K5	5
	..... Self Study		
Course Outcome	CO1: Recall HTML syntax and tags.	K1	
	CO2: Understanding the web pages with HTML that meet specified requirements.	K2	
	CO3:Optimize page styles and layout using CSS	K3	
	CO4: Develop JavaScript code to add interactivity and dynamic behavior to web pages.	K4	
	CO5: Analyze requirements and design web applications using Ajax.	K5	

Learning Resources	
Text Books	1. Pankaj Sharma —Web Technology, SkKataria& Sons Bangalore 2011. 2. Mike Mcgrath —Java Script, Dream Tech Press 2006, 1st Edition. 3. Achyut S Godbole&AtulKahate, —Web Technologies, 2002, 2nd Edition.
Reference Books	1. Laura Lemay, RafeColburn , 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, 2nd Edition.
Website Link	1. https://www.w3schools.com/tutorials/ 2. https://www.geeksforgeeks.org/web-development/
Self-Study Material	1. https://legacy.reactjs.org/tutorial/tutorial.html

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M_UCSN06	WEB DESIGNING	NMEC		2	2	-	-	2

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
S.Manokarthick	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science- Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSN07	**MULTIMEDIA SYSTEMS**	**NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students can understand the basics of Multimedia, Animation and Digital Video Containers							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction**: 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	4
II	**Images**: Plan Approach - Organize Tools - Configure Computer Workspace -Making Still Images - Color - Image File Formats. Sound: The Power of Sound -DigitalAudio-MidiAudioMidivs.DigitalAudio-MultimediaSystemSounds Audio File Formats -Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project	K2	5
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	5
IV	**Making Multimedia**: The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs - The Software Needs - An Authoring Systems Needs Multimedia ProductionTeam.	K4	5
V	**Planning and Costing**: The Process 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: Immersive experiences with AR and VR	K5	5
	…… Self Study		
Course Outcome	CO1:Remember the concepts, importance, application and the process of developing multimedia	K1	
	CO2: Understand have basic knowledge and understanding about image related processings	K2	
	CO3:To Apply the framework of frames and bit images to animations	K3	
	CO4: Analyse about the multimedia projects and stages of requirement in phases of project.	K4	
	CO5:Evaluate the concept of cost involved in multimedia planning, designing, and producing	K5	

Learning Resources	
Text Books	1.TayVaughan,"Multimedia:MakingItWork",8thEdition,Osborne/McGrawHill,2001.
Reference Books	1.Ralf Steinmetz & Klara Nahrstedt "Multimedia Computing, Communication & Applications", Pearson Education,2012
Website Link	1. https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/
Self-Study Material	1.https://www.thinkwithgoogle.com/intl/en-emea/future-of-marketing/emerging-technology/vr-ar-mr-and-what-does-immersion-actually-mean/

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

B.Sc. Computer Science- Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M_UCSN07	Multimedia Systems	NMEC		2	2	-	-	2

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS05/ 23M_UCSN13	**UNDERSTANDING INTERNET**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students can get knowledge of Internet							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**The Emergence Of Internet** as a mass medium-the world of world wide web'.	K1	5
II	**Features** Of Internet Technology.	K2	5
III	**Internet as a source of infotainment** – classification based on content and style.	K3	5
IV	**Demographic and psychographic** descriptions of internet audiences' – effect of internet on the values and life-styles	K4	5
V	**Present issues** such as cybercrime and future possibilities **Current Trends:** Cloud Computing	k5	4
	…… Self Study	k2	
Course Outcome	CO1: Remember the basic concept in internet Concept of mass medium and world wide web	K1	
	CO2: Understand the concept of internet as a technology.	K2	
	CO3:Apply the concept of infotainment and classification based on content and style	K3	
	CO4: Analyze the Can be able to know about Demographic and psychographic description of internet	K4	
	CO5:Evaluate the concept of cyber crime and future possibilities	K5	

Learning Resources	
Text Books	1. Barnouw, E and Krishnaswamy S [1990] Indian Film. New York, OUP. 2.Kumar, Keval [1999] Mass Communication in India. Mumbai, Jaico. 3.Srivastava, K M [1992] Media Issues. Sterling Publishers Pvt Ltd
Reference Books	1.Acharya, R N [1987] Television in India. Manas Publications, New Delhi. 2.Barnouw, E [1974] Documentary – A History of Nonfiction. Oxford, OUP 3.Luthra, H R [1986] Indian Broadcasting. Ministry of I& B, New Delhi. 4.Vasudev, Aruna [1986] The New Indian Cinema. Macmillan India, New Delhi.
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.w3schools.in/cloud-computing

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M_UCSS05/ 23M_UCSN13	**UNDERSTANDING INTERNET**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS06/ 23M_UCSN09	**Biometrics**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students can Identify the various biometric technologies and Design of biometric recognition.							

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, Biometric system error and performance measures, Design of biometric system, Applications of biometrics, Biometrics versus traditional authentication methods. Face Biometrics: Introduction, Background of Face Recognition, Design of Face Recognition System, Neural Network for Face Recognition, Face Detection in Video Sequences, Challenges in Face Biometrics, .7 Face Recognition Methods, Advantages and Disadvantages.	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, Applications of Iris Biometrics, Advantages and Disadvantages Vein and Fingerprint Biometrics: Introduction, Biometrics Using Vein Pattern of Palm, Fingerprint Biometrics, Fingerprint Recognition System, Minutiae Extraction, Fingerprint Indexing, Experimental Results, Advantages and Disadvantages.	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. Multimodal Biometrics: Introduction to Multimodal Biometrics , Basic Architecture of Multimodal Biometrics, Multimodal Biometrics Using Face and Ear, Characteristics and Advantages of Multimodal Biometrics, Characteristics and Advantages of Multimodal Biometrics.	K3	6
IV	**WatermarkingTechniques:** 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, Image Watermarking 6 CO4 Techniques, Watermarking Algorithm, Experimental Results, Effect of Attacks on Watermarking Techniques, Attacks on Spatial Domain Watermarking.	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, Radio Frequency Identification (RFID) Biometrics, DNA Biometrics, Comparative Study of Various Biometric Techniques. Biometric Standards: Introduction, Standard Development Organizations, Application Programming Interface (API), Information Security and Biometric Standards, Biometric Template Interoperability.	k5	6

	Current Trends: Face recognition			
	…… Self Study		K2	
Course Outcome	CO1: Remember the basic concepts and the functionality of the Biometrics, Face Biometrics, Types, Architecture and Applications.		K1	
	CO2: Understand the concepts Retina and Iris Biometrics and Vein and Fingerprint Biometrics.		K2	
	CO3: Apply the Privacy Enhancement and Multimodal Biometrics.		K3	
	CO4:Analyze get analytical idea on Watermarking Techniques		K4	
	CO5: Evaluate Gain knowledge on Future scope of Biometrics,and Study of various Biometric Techniques.		K5	
Learning Resources				
Text Books	1.Biometrics: Concepts and Applications by G.R Sinha and SandeepB.Patil , Wiley, 2013			
Reference Books	1.Guide to Biometrics by Ruud M. Bolle , SharathPankanti, Nalinik.Ratha, Andrew W.Senior, Jonathan H. Connell , Springer 2009 2.Introduction to Biometrics by Anil k. Jain, Arun A. Ross, KarthikNandakumar 3.Hand book of Biometrics by Anil K. Jain, Patrick Flynn, ArunA.Ross.			
Website Link	1. https://www.tutorialspoint.com/biometrics/index.html 2. https://www.javatpoint.com/biometrics-tutorial 3. https://www.thalesgroup.com/en/markets/dig			
Self-Study Material	1.https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/biometrics/facial-recognition			
	L-Lecture	**T-Tutorial**	**P-Practical**	**C-Credit**

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M_UCSS06A 23M_UCSN09	**Biometrics**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**	

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
R.Mohanraj	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS07/ 23M_UCSN10	Cyber Forensics	SEC/NMEC		2	2	-	-	2
Objective	Students able to Understand the definition of computer forensics fundamentals and study about the Types of Computer Forensics Evidence							

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 of Military Computer Forensic Technology - Types of Law Enforcement - Computer Forensic. Technology - Types of Business Computer Forensic Technology.	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-*Digital Forensics***	K5	6
	..... Self Study		
Course Outcome	CO1: Define the definition of computer forensics fundamentals.	K1	
	CO2: Understand the different types of computer forensics technology.	K2	
	CO3: Apply various computer forensics systems.	K3	
	CO4: Analyze the methods for data recovery, evidence collection and data seizure.	K4	
	CO5: Evaluate your Gain 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.
Website Link	1. https://www.vskills.in 2. https://www.hackingarticles.in/best-of-computer-forensics-tutorials/
Self-Study Material	1.https://icssindia.in/blog/future-trends-in-cyber-security-and-digital-forensics/

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

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M_UCSS07/ 23M_UCSN10	Cyber Forensics	SEC/NMEC		2	2	-	-	2

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
N.Ramya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS08/ 23M_UCSN11	**Pattern Recognition**	**SEC/NMEC**	**IV**	**2**	**2**	**-**	**-**	**2**
Objective	Students able to understand the fundamentals of Pattern Recognition							

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	4
II	**Statistical Pattern Recognition** :Introduction to Statistical PatternRecognition - supervised Learning using Parametric and Non - Parametric Approaches.	K2	4
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	6
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-* Face recognition and visual search ***	K5	4
	..... Self Study		
Course Outcome	CO1: Have a Basic knowledge and Remembering the parametric and non-parametric related concepts.	K1	
	CO2: Understand the concepts, importance, application and the process of developing Pattern recognition overview.	K2	
	CO3: Apply the framework of frames and bit images to Animations.	K3	
	CO4: Analysis the Speaks about the multimedia projects and stages of requirement in phases of project.	K4	
	CO5: Analysis the concept of cost involved in multimedia planning, designing, and producing	K4	

Learning Resources	
Text Books	1.Duda R.O., P.E.Hart& D.G Stork, — Pattern Classification‖, 2nd Edition, J.Wiley.
Reference Books	1. Earl Gose, Richard johnsonbaugh, Steve Jost, —Pattern Recognition and Image Analysis‖, Prentice Hall of India, Pvt Ltd, New Delhi. 2. Duda R.O.& Hart P.E., —Pattern Classification and Scene Analysis‖, J.wiley
Website Link	1. https://www.geeksforgeeks.org/pattern-recognition-introduction/ 2. https://www.mygreatlearning.com/blog/pattern-recognition-machine-learning/
Self-Study Material	1.https://usa.kaspersky.com/resource-center/definitions/what-is-facial-recognition#:~:text=Your%20faceprint%20is%20then%20compared,be%20used%20for%20facial%20recognition.

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M_UCSS08/ 23M_UCSN11	Pattern Recognition	SEC/NMEC		2	2	-	-	2

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
N.Ramya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS09/ 23M_UCSN12	**Simulation and Modeling**	**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**
Objective	Students can create tools for viewing and controlling simulations							

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 Variate 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 - Discrete - Event Modeling Approaches - Event- Scheduling Approach - Process Interaction Approach.	K3	4
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	4
V	**Optimization Algorithms - Genetic Algorithms - Simulated Annealing Examples:** Sensor Systems Modeling - Human Eye Modeling - Optical Sensor Modeling - Radar Modeling. **Current Trends-* Elevating the metaverse ***	K5	4
	..... Self Study		

Course Outcome	CO1: Remember Introduction To Modeling & Simulation, Input Data Analysis and Modeling.				K1
	CO2: Understand Random Variate and Number Generation. Analysis of Simulations and methods.				K2
	CO3: Analysis Comparing Systems via Simulation				K3
	CO4: Apply Entity Body Modeling, Visualization, and Animation.				K4
	CO5: Evaluate the Algorithms and Sensor Modeling.				K5
Learning Resources					
Text Books	1. Jerry Banks, ―Handbook of Simulation: Principles, Methodology Advances, Applications, and Practice‖, John Wiley & Sons, Inc., 1998.				
Reference Books	1. Andrew F. Seila, Vlatko Ceric, PanduTadikamalla, ―Applied Simulation Modeling‖, Thomson Learning Inc., 2003. 2. George S. Fishman, ―Discrete-Event Simulation: Modeling, Programming and Analysis‖, Springer-Verlag New York, Inc., 2001.				
Website Link	1. https://www.tutorialspoint.com/modelling_and_simulation/index.htm 2. https://www.javatpoint.com/verilog-simulation-basics				
Self-Study Material	1.https://www.tutorialspoint.com/modelling_and_simulation/modelling_and_simulation_quick_guide.htm#:~:text=Modelling%20%26%20Simulation%20can%20be%20applied,%2C%20and%20E%2Dbusiness%20models.				
	L-Lecture	**T-Tutorial**	**P-Practical**		**C-Credit**

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M_UCSS09/ 23M_UCSN12	**Simulation and Modeling**		**SEC/NMEC**		**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	**Verified By**	**Approved By**
N.Ramya	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSS10	**DATABASE MANAGEMENT SYSTEMS**	**SEC**	**III**	**2**	**2**	**-**	**-**	**2**
Objective	Students can understand the basic concepts and applications of database systems.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction** - Database System Application - Purpose of Database Systems - View of Data - Database Languages - Transaction Management - Database Architecture.	K1	4
II	**Relational Model :** Structure of Relational Database - Database Design - ER Model - SQL : Background - Data definition - Basic Structure of SQL - Queries - Set Operations - Aggregate Functions - Null Values - Nested Sub Queries.	K2	6
III	**Intermediate SQL :** Join Expressions - View - Transactions - Authorization - Advance SQL : Functions and Procedures - Triggers	K3	6
IV	**PL/SQL :** Programming Language: Fundamentals - Block Structure - Comments - Data Types - Declaration - Assignment operation - Bind Variables - Printing Operators.	K4	4
V	**PL/SQL Composite Data types:** Records - Tables - V Arrays. Named Blocks : Procedures - Functions - Packages - Triggers - Data Dictionary Views. *__Current Trends:__ Database Languages*	K5	4
	..... Self Study		
Course Outcome	CO1: Demonstrate the basic elements of a relational database management system	K1	
	CO2: Identify the data models for relevant problems.	K2	
	CO3: Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries	K3	
	CO4: Demonstrate their understanding of key notions of query evaluation and optimization techniques.	K4	
	CO5: Extend normalization for the development of application software	K5	

Learning Resources	
Text Books	1. Fundamentals of Database Management Systes‖, Alexis Leon, Mathews Leon,Vijay Nicole Imprints Private Limited 2.Database Systems Using Oracle‖, Nilesh Shah, 2 nd Edition, PHI .
Reference Book	1. Database System Concepts‖, Abraham Silberschatz, Henry F. Korth, S.Sudharshan, TMH - 5 th Edition
Website Link	1. http://www.learn-c.org/
Self-Study Material	1.https://link.springer.com/chapter/10.1007/978-3-662-03526-9_5

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSS10	**DATABASE MANAGEMENT SYSTEMS**			**SEC-I**	**III**	**2**	**2**	**-**	**-**	**2**
CO-PO Mapping										
CO Number	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	M	S	M	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	L	S	S	S	S	M	S	S	S	S
Level of Correlation between CO and PO				L-LOW		M- MEDIUM			S-STRONG	
Tutorial Schedule	Conducting Group Discussion, Class test									
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation									
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE									

Designed By	**Verified By**	**Approved By**
M.Kalaiselvi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc- Computer Science Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSS11	INTERNET AND WEB TECHNOLOGY	SEC	III	2	2	-	-	2
Objective	Students can acquire the basic knowledge in Internet and accessing the web essentials							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Web Essentials:** Clients, Servers, and Communication. The Internet-Basic Internet Protocols The World Wide Web- HTTP request message-response message-Web Clients Web Servers-Case Study. Markup Languages: XHTML.An Introduction to HTML History-Versions-Basic XHTML Syntax and SemanticsSome Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents	K1	8
II	**Style Sheets:** CSS-Introduction to Cascading Style Sheets- Features-Core Syntax-Stylesheet and HTML Style Rle Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-Other Properties-Case Study.	K2	8
III	**Client- Side Programming:** The JavaScript Language- History and Versions Introduction JavaScript in Perspective- Syntax Variables and Data Types-StatementsOperators- Literals-Functions-Objects-Arrays-Built-in Objects- JavaScript Debuggers.	K3	10
IV	**Host Objects :** Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling Accommodating Non Compliant Browsers Properties of window-Case Study.	K3	11
V	**Server-Side Programming**: Java Servlets- Architecture - Overview-A Servlet-Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies- URL Rewriting- Other Capabilities-Data Storage Servlets and Concurrency- Case Study- Related Technologies. ***Current Trend : Web3***	K4-K5	8
Course Outcome	**CO1:** Remember the web essentails	K1	
	CO2: Understand web pages using XHTML and CSS.	K2	
	CO3: Apply dynamic web pages using Client side programming	K3	
	CO4: Analyze XML documents and Schemes	K4	
	CO5: Evaluate dynamic web pages using server side programming	K5	

Learning Resources				
Text Books	1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006. 2. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.			
Reference Books	1. Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006. 2. Marty Hall and Larry Brown,"Core Web Programming" Second Edition, Volume I and II, Pearson Education, 2001.			
Website Link	1.https://www.edx.org/course/			
Self-Study Material	1. https://www.freecodecamp.org/news/learn-web3js-basics//			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UCSS11	**INTERNET AND WEB TECHNOLOGY**			**SEC**	**III**	**2**	**2**	**-**	**-**	**2**
CO-PO Mapping										
CO Number	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	M	S	M	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	L	S	S	S	S	M	S	S	S	S
Level of Correlation between CO and PO				L-LOW		M- MEDIUM			S-STRONG	
Tutorial Schedule	Conducting Group Discussion, Class test									
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation									
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE									
Designed By		**Verified By**			**Approved By**					
M.Kalaiselvi		HOD Mr.P.Subramaniam			Member Secretary Dr.S.Shahitha					

B.Sc. Computer Science Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSS12	**LINUX ESSENTIALS**	**SEC**	**IV**	**2**	**2**	**-**	**-**	**2**
Objective	Students can get theoretical foundation, systematic and professional knowledge							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction To Linux And Linux Utilities:** History of LINUX - Architecture of LINUX - Features of LINUX - Introduction to vi editor - Linux commands - File handling utilities - Security by file permissions - process utilities - disk utilities – networking commands – Text Processing utilities and backup utilities.	K1	5
II	**Introduction to Shells:** Linux Session - Standard Streams - Redirection – Pipes - Tee Command - Command Execution - Command Line Editing – Quotes - Command Substitution -Job Control – Aliases – Variables - Predefined Variables -Options - Shell/Environment Customization – Filters and Pipes - Concatenating files - Display Beginning and End of files - Cut and Paste – Sorting - Translating Characters - Files with Duplicate Lines - Count Characters, Words or Lines, Comparing Files.	K2	4
III	**File Structure And Management:** Grep Operation grep Family - Searching for File Content – Sed Script – Operation – Addresses - commands – Applications - Grep and sed.	K3	5
IV	**Process And Signals:** Process - process identifiers - process structure - process table,- viewing processes - system processes - process scheduling - starting new processes – waiting - zombie processes - orphan process - signals functions - unreliable signals - interrupted system calls - File locking - creating lock files - locking regions - use of read and write with locking - competing locks, other lock commands, dea dlocks.	K4	5
V	**Inter Process Communication And Sockets:** Pipe - process pipes - pipe call - parent and child processes - named pipes – FIFOS - semaphores –message queues - shared memory- Socket - socket connections – socket attributes, socket addresses - socket communications. **Current Trends: Red Hat Linux**	K5	5
Course Outcome	**CO1**: Remember the fundamentals of operating systems, functions and their structure and functions.		K1
	CO2: Understand concept of process management policies, CPU Scheduling		K2
	CO3: Apply and implement the requirement of process synchronization		K3
	CO4: Analyze and implement the requirement of process synchronization		K4
	CO5: Evaluate the disk scheduling and real time application.		K5

Learning Resources			
Text Books	1. N. Matthew, R.Stones, Wrox, Begining Linux Programming, 4th Edition, Wiley India Edition. 2. S. Parker – "Shell Scripting", Wiley India Pvt. Ltd.		
Reference Books	1. Richard Petersen –" Linux" The Complete Reference, TMH		
Website Link	1. https://nptel.ac.in/courses/117106113 2. https://www.geeksforgeeks.org/linux-tutorial/		
Self-Study Material	1.https://www.educative.io/answers/what-is-the-red-hat-enterprise-linux-operating-system		
L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. Computer Science Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UCSS12	LINUX ESSENTIALS	SEC	IV	2	2	-	-	2

CO-PO Mapping:

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

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

Tutorial Schedule	Group discussion, Lab Visit, Problem Solving, Quiz
Teaching and Learning Methods	Chalk and Talk, Visualization and Smart Class
Assessment Methods	Assignments, CIA1 and CIA 2, End Semester Examination

Designed By	Verified By	Approved By
M.Kalaiselvi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

S.NO.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	I	24M1UCSS01	PROBLEM SOLVING TECHNIQUES

B.Sc., Computer Science Syllabus LOCF-CBCS with effective from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UCSFC1	PROBLEM SOLVING TECHNIQUES	FC THEORY-I	I	2	2	-	-	2
Objective	Students can familiarize with writing of algorithms, fundamentals of C.							

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 Selection Structures. **Repetition Structures:** Counter Controlled Loops –Nested Loops– Applications of Repetition Structures.	K3	6
IV	**Data:** Numeric Data and Character Based Data. **Arrays:** One Dimensional Array - Two Dimensional Arrays – Strings as Arrays ofCharacters.	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.	K5	6
Course Outcome	**CO1:** Remember the programming languages.	K1	
	CO2: Understand about the algorithms.	K2	
	CO3: Apply the selection and repetition structure.	K3	
	CO4: Analyze about Arrays.	K4	
	CO5: Evaluate program modules. Creating and reading Files	K5	

Learning Resources	
Text Books	1.Stewart Venit, ―Introduction to Programming: Concepts and Design‖, Fourth Edition, 2010,Dream Tech Publishers.
Reference Books	1.Harold Abelson, Gerald Jay Sussman, Julie sussen, Structure and interpretation of computer programs, MIT Press
Website Link	1.https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm 2.http://www.nptel.iitm.ac.in/video.php?subjectId=106102067 3.http://utubersity.com/?page_id=876
L-Lecture	T- Tutorial P-Practical C-Credit

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**		**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UCSFC1	PROBLEM SOLVING TECHNIQUES			FC THEORY-I		I	2	2	-		2
CO-PO Mapping										
CO Number	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	M	M	S	S	S	M	L	M	L
CO2	M	S	M	M	S	S	S	M	M	S
CO3	M	M	S	S	M	M	S	M	S	S
CO4	S	S	S	M	S	M	M	S	M	M
CO5	S	M	S	S	S	S	M	M	M	S
Level of Correlation between CO and PO				L-LOW		M- MEDIUM			S-STRONG	
Tutorial Schedule	Conducting Group Discussion, Class test									
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation									
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE									

Designed By	**Verified By**	**Approved By**
S.Jothivel	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc., Computer Science Syllabus LOCF-CBCS with effective from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UCSFC1	**PROBLEM SOLVING TECHNIQUES**	**FC THEORY-I**	**I**	**2**	**2**	**-**		**2**
Objective	Students can familiarize with writing of algorithms, fundamentals of C .							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction to the C Language** – Algorithm, Pseudo code, Flow chart, Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output, Operators(Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associatively, Expression Evaluation, Type conversions.	K1	4
II	**Statements**- Selection Statements(making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to Statement.	K2	4
III	**Functions**- Introduction to Structured Programming, Functions-basics, user defined functions, inter function communication(call by value, call by reference), Standard functions. Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions.	K3	4
IV	**Arrays**- Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, Introduction to pointers, Arrays and Pointers, Pointer Arithmetic, memory allocation functions, array of pointers, pointers to void, pointers to functions, command -line arguments, Introduction to structures and unions.	K4	6
V	**Strings** – Concepts, C Strings, String Input / Output functions, string manipulation functions, string/data conversion. Input and Output – Concept of a file, streams, text files and binary files. . ***CURRENT TENDS - POINTERS***	K5	6
	/Self Study/		
Course Outcome	**CO1:** Remember the programming languages.	K1	
	CO2: Understand about the algorithms.	K2	
	CO3: Apply the selection and repetition structure.	K3	
	CO4: Analyze about Arrays.	K4	
	CO5: Evaluate the stings in programs	K5	

Learning Resources	
Text Books	1.A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning. 2.The C Programming Language by Brian Kernighan and Dennis Ritchie 2nd edition
Reference Books	1. Let Us C Yashavant kanetkar BPB. 2. Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994. 3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.
Website Link	1.http://www.learn-c.org/
Self-Study Material	1.https://dl.acm.org/doi/10.1145/3290380
L-Lecture	T- Tutorial P-Practical C-Credit

B.Sc. Computer Science - Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
24M1UCSFC1	PROBLEM SOLVING TECHNIQUES		FC THEORY-I	I	2	2	-		2

CO-PO Mapping

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

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

Tutorial Schedule	Conducting Group Discussion, Class test
Teaching and Learning Methods	Handling classes through chalk & talk method, PPT presentation
Assessment Methods	Attendance, Assignment, CIA I, CIA II and ESE

Designed By	Verified By	Approved By
S.Jothivel	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc.-Computer Science Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UCSIS1	INTERNSHIP TRAINING	INTERNSHIP	V	-	-	-	-	2
Objective	Students can get exposure on the practical aspects of Computer Science in Industries							

Guidelines for Internship Programme	**Knowledge Levels**	**Sessions**
1. Duration of the internship training is 15 days during the Vacation which falls at the end of the 5th Semester. 2. The departments concerned will prepare on exhaustive panel of Institutions, Industries and practitioners. 3. The individual student has to identify the institution / industry / practitioners of their choice and inform the same to the HOD / Staff-in-Charge. 4. The students hereafter will be called Trainees should maintain a work diary in which the daily work done should be entered and the same should be Attested by the Section in-charge. 5. The departments should prepare an outline of the job to be done, Sections in which they have to be attached both in the office as well as in the field. 6. The trainees should strictly adhere to the rules and regulations and office Timings of the institutions to which they are attached. 7. The trainees have to obtain a certificate on successful completion of the Internship from the Chief Executive of the organization. 8. A Staff member of a Department (Guide) will be monitoring the Performance of the Candidate. 9. Schedule of visit to be made by the staff is to be prepared by the HOD / Staff-in-charge. 10. Report writing manual and format should be prepared by the respective Departments. 11. All model forms are to be attached wherever it is necessary. 12. Report evaluation: External Viva-Voce examination will be conducted and the maximum mark is 100. 13. Report should be properly submitted after the completion of internship Training.	K4,K5	
Course Outcome — **CO1:** Analyze and Evaluate to test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.	K5	

Learning Resources				
Website Link	https://www.tutorialspoint.com/r/index.htm https://www.javatpoint.com/net-framework			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc.-Computer Science Syllabus LOCF-CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M5UCSIS1	INTERNSHIP TRAINING	INTERNSHIP	V	-	-	-	-	2	

CO Number	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	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	-
Teaching and Learning Methods	Working with programming languages such as C++, Python and Java
Assessment Methods	CIA -100 %
	Work Diary – 25% and Training Report and Viva-voce – 75%

M.Kalaisevi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha

B.Sc. Computer Science Syllabus LOCF-CBCS with effective from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSPR1	PROJECT WORK	PROJECT	VI	5	5			4
Objective	Students has to understand the real time software development environment. The student should gain a thorough knowledge in the problem and language / software which he/she has selected for their project work.							

Unit	Course Content	Knowledge Levels	Sessions

Project Planning:

B.Sc. (Computer Science)/ Project is an involved exercise, which has to be plannedwell in advance. The topic should be chosen in the beginning of final year itself. Relatedreading training and discussions of project should be completed in the first term of finalyear.

I Selection of Team

To meet the stated objectives, it is imperative that mini project is done through a teameffort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with Two members. A team leader shall beselected. Team shall maintain the minutes of meeting of the team members and ensurethat tasks have been assigned to every team member in writing. Team meeting minutesshall form a part of the project report. Even if students are doing project as groups, each one must independently take different modules of the work and must submit the report.

II Selection of Tools

No restrictions shall be placed on the students in the choice of platform/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of toolsin the evaluation of the project.

III 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: CHAPTERHEADINGS 16 pt, Arial

- Bold, All caps, Centered Section Headings 14 pt Bookman old style, Bold, Left adjusted. Section Sub-heading 12pt, Bookman old style.
- Title of figures tables etc are done in 12 point, Times New Roman, Italics,
- centered. Only 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 magazinefor detail) While
- doing the project keep note of all books you refer, in the correct format and includethem 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 projectshould be reviewed A Sample format is enclosed in Annexure-II.
  - Format of the Title page and Certificate are enclosed in Annexure III.

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

Course Outcome	CO1:Understand of research idea	K2	
	CO2:Analyze of problem solving skills	K3	
	CO3:Apply sources for conduct of Research	K4	
	CO4:Evaluate the research report	K5	
	CO5:Create the research report	K6	
Learning Resources			
Text Books	1.Bert Bates, Karthy Sierra , Eric Freeman, Elisabeth Robson, "Head First Design Patterns", O'REILLY Media Publishers. 2. Mathew Mac Donald, "ASP.NET Complete Reference", TMH 2005.		
Reference Books	1. Jan Graba, "An Introduction to Network Programming with Java- Java 7 Compatible", 3rd Edition,Springer. 2. Crouch Matt J, "ASP.NET and VB.NET Web Programming", Addison Wesley		
Website Link	1.https://www.tutorialspoint.com/r/index.htm 2.https://www.javatpoint.com/net-framework		
L-Lecture	T- Tutorial	P-Practical	C-Credit

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**		**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M6UCSPR1	**PROJECT WORK**		**PROJECT**	**VI**	**5**	**5**			**4**	
CO-PO Mapping										
CO Number	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	M	M	S	S	S	M	L	M	L
CO2	M	S	M	M	S	S	S	M	M	S
CO3	M	M	S	S	S	S	S	M	S	S
CO4	M	S	S	M	S	S	M	S	M	M
CO5	S	M	S	S	S	S	M	M	M	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 and .Net.									
Assessment Methods	Attendance, Review / Work Diary, Final Report andViva Voce									
Designed By		**Verified By**			**Approved By**					
M.Kalaisevi		HOD Mr.P.Subramaniam			Member Secretary Dr.S.Shahitha					

B.Sc. Computer Science Syllabus LOCF-CBCS with effective from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UCSOE1	**Computer Science for Competitive Examination**	**Self-study Online - Competitive Examination**	**6**			**2**		**2**
Objective	Students can Impart knowledge about the appearing for Competitive Examination and it impacts and developing an attitude of appearing for such exams.							

Unit	Course Content	Knowledge Levels	Sessions
	This course deals with the question related to Software Engineering, Internet of Things, Operating System, Computer Architecture, Database Management System, Computer Networks, Programming Languages, Java, Algorithms, Artificial Intelligence, and Mobile Computing. Major emphasis has been put forth to include recent developments in the subjects. This course aims to give a holistic view of all the topics which comprised of some factual text points, multiple choice questions (MCQ), it is extremely suitable for students pursuing their higher degree in University/institute for their entrance exams, students preparing for various national and state level competitive entrance exams such as TANCET, IBPS, SSC for creating MCQ pattern.		
	1. Objective type online examination will be conducted at the end of 4th semester. 2. Questions must be taken from all previous question papers of TANCET,IBPS And SSC. 3. Test critical thinking. Multiple choice questions to test the superficial knowledge. Learners to interpret facts, evaluate situations, explain cause and effect, make inferences, and predict results. Emphasize Higher-Level Thinking. Use memory-plus application oriented questions. These questions require students to recall principles, rules or facts in a real life context.		
	Eg.1 One Tera byte (1 TB) is equal to? (a)1028 gb (b)1012 gb (c)1000 gb (d)1024 gb Eg.2 URL stands for: (a)Uniform Resource Locator (b)Uniform Resource Library (c)United Resource Locators (d)None of these 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 and Understand the basic language implementation techniques	K1	
	CO2: Apply the problem and develop problem solving skills in competitive exams	K2	
	CO3: Apply on Computational problems	K3	
	CO4: Analyze computer science theory and software development fundamentals to produce computing- based solutions	K4	
	CO5: Evaluate complex computing problem and to apply principles of computing	K5	
Learning Resources			
Reference Books	1.Objective Computer Science and Information Technology by Jushta Jaiswal, Jushta Jaiswal publications.		
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		

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

B.Sc. Computer Science – Syllabus LOCF – CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M6UCSOE1	**Computer Science for Competitive Examination**	**Self-study Online - Competitive Examination**	**6**			**2**		**2**	

CO-PO Mapping

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

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

Tutorial Schedule	TNPSC, IBPS, UPSC, RRB, SSC, GATE, TRB Old question papers – solutions – online mock test
Teaching and Learning Methods	Self-study
Assessment Methods	100 multiple choice questions through computer based online examinations passing minimum is 50%

Designed By	**Verified By**	**Approved By**
M.Kalaisevi	HOD Mr.P.Subramaniam	Member Secretary Dr.S.Shahitha