V.V.VANNIAPERUMAL COLLEGE FOR WOMEN
(Belonging to Virudhunagar Hindu Nadars)
An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai
Re-accredited with 'A++' Grade (4th Cycle) by NAAC
VIRUDHUNAGAR
Quality Education with Wisdom and Values

OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM REGULATIONS AND SYLLABUS
(with effect from Academic Year 2024 - 2025)

V.V.Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 13 UG Programmes (Aided),15 UG Programmes (SF), 15 PG Programmes and 6 Ph.D. Programmes. The curricula for all these Programmes, except Ph.D. Programmes, have been framed as per the guidelines given by the University Grants Commission (UGC) &Tamil Nadu State Council for Higher Education (TANSCHE) under Choice Based Credit System (CBCS) and the guidelines for Outcome Based Education (OBE).

The Departments of Commerce, English, History, Mathematics, Biochemistry and Tamil upgraded as Research Centres offer Ph.D. Programmes as per the norms and regulations of Madurai Kamaraj University, Madurai and do not come under the purview of CBCS.

A. CHOICE BASED CREDIT SYSTEM (CBCS)

The CBCS provides an opportunity for the students to choose Courses from the prescribed Courses. The CBCS is followed as per the guidelines formulated by the UGC. The performance of students is evaluated based on the uniform grading system. Computation of the Cumulative Grade Point Average (CGPA) is made to ensure uniformity in evaluation system.

List of Programmes in which CBCS/Elective Course System is implemented

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UG PROGRAMMES

Arts & Humanities	:	History (E.M. & T.M.), English, Tamil
Physical & Life Sciences	:	Mathematics, Zoology, Chemistry, Physics, Biochemistry, Home Science - Nutrition and Dietetics, Costume Design and Fashion, Microbiology, Biotechnology, Computer Science, Information Technology, Data Science, Computer Applications and Computer Applications - Graphic Design
Commerce & Management	:	Commerce, Commerce (Computer Applications), Commerce (Professional Accounting), Business Administration

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PG PROGRAMMES

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Physics, Chemistry, Zoology, Biochemistry, Home Science - Nutrition and Dietetics, Biotechnology, Computer Science, Computer Science (Data Science) and Computer Applications (MCA) *
Commerce & Management	:	Commerce, Business Administration (MBA) *
		* AICTE approved Programmes

OUTLINE OF CHOICE BASED CREDIT SYSTEM – UG

1. Core Courses
2. Elective Courses
   - Generic Elective Courses
   - Discipline Specific Elective Courses (DSEC)
   - Non Major Elective Courses (NMEC)
3. Skill Enhancement Courses (SEC)
4. Environmental Studies (EVS)
5. Value Education
6. Self Study Courses (Online)
7. Extra Credit Courses (Self Study Courses) (Optional)

List of Non Major Elective Courses (NME)
(2024-2025 onwards)

UG PROGRAMMES

Name of the Course	Course Code	Semester	Department
Introduction to Tourism	24UHIN11	I	History (E.M)
Indian Constitution	24UHIN21	II	
சுற்றுலா ஓர் அறிமுகம்	24UHIN11	I	History (T.M)
இந்திய அரசியலமைப்பு	24UHIN21	II	
Popular Literature and Culture	24UENN11	I	English
Philosophy for Literature	24UENN21	II	
அடிப்படைத் தமிழ் இலக்கணம் – I எழுத்தறிதல்/ பேச்சுக்கலைத்திறன்	24UBTN11/ 24UTAN11	I	Tamil

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அடிப்படைத்தமிழ் – மொழித் திறனறிதல் / பயன்முறைத் தமிழ்	24UBTN21/ 24UTAN21	II	
Basic Hindi - I	24UBHN11	I	Hindi
Basic Hindi - II	24UBHN21	II	
Practical Banking/ Financial Literacy-I	24UCON11/ 24UCON12	I	Commerce
Basic Accounting Principles/ Financial Literacy-II	24UCON21/ 24UCON22	II	
Practical Banking / Self-Employment and Startup Business	24UCON11/ 24UCCN11	I	Commerce C.A.
Basic Accounting Principles / Fundamentals of Marketing	24UCON21/ 24UCCN21	II	
Women Protection Laws	24UCPN11	I	Commerce Professional Accounting
Basic Labour Laws	24UCPN21	II	
Basics of Event Management	24UBAN11	I	Business Administration
Managerial Skill Development	24UBAN21	II	
Quantitative Aptitude -I	24UMTN11	I	Mathematics
Quantitative Aptitude - II	24UMTN21	II	
Physics for EveryDay Life	24UPHN11	I	Physics
Astrophysics	24UPHN21	II	
Food Chemistry	24UCHN11	I	Chemistry
Dairy Chemistry	24UCHN21	II	
Ornamental fish farming and Management	24UZYN11	I	Zoology
Biocomposting for Entrepreneurship	24UZYN21	II	
Foundations of Baking and Confectionery	24UHSN11	I	Home Science – Nutrition and Dietetics
Women's Health and Wellness	24UHSN21	II	
Nutrition and Health	24UBCN11	I	Biochemistry
Life Style Diseases	24UBCN21	II	
Social and Preventive Medicine	24UMBN11	I	Microbiology
Nutrition & Health Hygiene	24UMBN21	II	
Herbal Medicine	24UBON11	I	Biotechnology
Organic Farming and Health Management	24UBON21	II	

Basics of Fashion	24UCFN11	I	Costume Design And Fashion
Interior Designing	24UCFN21	II	
Office Automation	24UCSN11	I	Computer Science
Introduction to HTML	24UCSN21	II	
Office Automation	24UITN11	I	Information Technology
Basics of Internet	24UITN21	II	
Fundamentals of Information Technology	24UDSN11	I	Data Science
Computer Fundamentals	24UDSN21	II	
Office Automation	24UCAN11	I	B.C.A.
Web Designing	24UCAN21	II	
OrganicFarming	24UBYN11	I	Botany
Nursery and Landscaping	24UBYN12	I	
Mushroom Cultivation	24UBYN21	II	Botany
MedicinalBotany	24UBYN22	II	
Library and Information Science - I	24ULSN11	I	Library Science
Library and Information Science - II	24ULSN21	II	
Cadet Corps for Career Development I	24UNCN11	I	National Cadet Corps
Cadet Corps for Career Development II	24UNCN21	II	

B. OUTCOME BASED EDUCATION (OBE) FRAMEWORK

The core philosophy of Outcome Based Education rests in employing a student - centric learning approach to measure the performance of students based on a set of pre-determined outcomes. The significant advantage of OBE is that it enables a revamp of the curriculum based on the learning outcomes, upgrade of academic resources, quality enhancement in research and integration of technology in the teaching –learning process. It also helps in bringing clarity among students as to what is expected of them after completion of the Programme in general and the Course in particular. The OBE directs the teachers to channelize their teaching methodologies and evaluation strategies to attain the PEOs and fulfil the Vision and Mission of the Institution.

Vision of the Institution

The founding vision of the Institution is to impart Quality Education to the rural womenfolk and to empower them with knowledge and leadership quality.

Mission of the Institution

The mission of the Institution is to impart liberal education committed to quality and excellence. Its quest is to mould learners into globally competent individuals instilling in them life-oriented skills, personal integrity, leadership qualities and service mindedness.

B.1 Programme Educational Objectives, Programme Outcomes and Programme Specific Outcomes

It is imperative for the institution to set the Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Course Outcomes (COs), consistent with its Vision and Mission statements. The PEOs and the POs should be driven by the mission of the institution and should provide distinctive paths to achieve the stated goals. The PEOs for each Programme have to fulfil the Vision and Mission of the Department offering the Programme.

Vision of the Department of Computer Science

The Department of Computer Science is envisioned to create industry ready Computer Science students with ardour for personal growth.

Mission of the Department of Computer Science

To create an environment conducive for transforming rural women students into eminent students prepared for a globalized technological era and to instil in them a passion to strive for perpetual personal uplift.

Programme Educational Objectives (PEOs) of B.Sc. Computer Science

Key Components of Mission Statement	Programme Educational Objectives (PEOs)		
	PEO1	**PEO2**	**PEO3**
transforming rural women students		√	
eminent students	√	√	√
prepared for a globalized technological era	√	√	
a passion to strive for perpetual personal uplift			√

B.1.2 Programme Outcomes (POs)

POs shall be based on Graduate Attributes (GAs) of the Programme. The GAs are the

PEO1	Students gain knowledge and expertise in advanced domains of Computer Science like website design, mobile apps development and data analytics.
PEO2	The rural women students will emerge as eminent software professionals with team building capacity and leadership quality to suit the modern software industry.
PEO3	The students imbibe moral values and professional ethics to shape themselves as skilled persons to work as an individual with topical updates and as a team to contribute towards the need of industry and society.

attributes expected of a graduate from a Programme in terms of knowledge, skills, attitude and values. The Graduate Attributes include Disciplinary Knowledge, Communication Skills, Critical Thinking, Problem Solving, Analytical Reasoning, Research Related Skills, Co-operation/Team Work, Scientific Reasoning, Reflective Thinking, Information/Digital Literacy, Multicultural Competence, Moral and Ethical Awareness/Reasoning, Leadership Qualities and Lifelong Learning.

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

1 apply effectively the acquired knowledge and skill in the field of Arts, Physical Science, Life Science, Computer Science, Commerce and Management for higher studies and employment. (*Disciplinary Knowledge*)

2 articulate innovative thoughts and ideas proficiently in both in spoken and written forms. (*Communication Skills)*

3 identify, formulate and solve problems in real life situations scientifically / systematically by adapting updated skills in using modern tools and techniques. (*Scientific Reasoning and Problem Solving)*

4 critically analyse, synthesize and evaluate data, theories and ideas to provide valid suggestions through assignments, case studies, Internship and projects for the fullfillment of the local, national and global developmental needs. (*Critical Thinking and Analytical Reasoning)*

5 use ICT in a variety of self-directed lifelong learning activities to face career challenges in the changing environment. (*Digital Literacy, Self - directed and Lifelong Learning)*

6 self-manage and function efficiently as a member or a leader in diverse teams in a multicultural society for nation building. (*Co-operation/Team Work and Multicultural Competence)*

7   uphold the imbibed ethical and moral values in personal, professional and social life for sustainable environment. (*Moral and Ethical Awareness)*

B.1.3 Programme Specific Outcomes (PSOs)

Based on the Programme Outcomes, Programme Specific Outcomes are framed for each UG Programme**.** Programme Specific Outcomes denote what the students would be able to do at the time of graduation. They are Programme specific. It is mandatory that each PO should be mapped to the respective PSO.

PROGRAMME SPECIFIC OUTCOMES

On completion of B.Sc. Computer Science programme, the students will be able to

PO1 - *Disciplinary Knowledge*

PSO 1.a: apply principles, methods and techniques of various domains of Computer Science and courses related to Computer Science to a wide range of applications.

PSO 1.b: use modern software development tools, packages and platforms.

PO2 – *Communication Skills*

PSO 2.a: give and receive clear instructions, write effectual reports, design documentation

and make remarkable presentations on concepts related to Computer Science.

PSO 2.b: express complex technical ideas effectively to peers, other assemblage like IT community and the entire society.

PO3 - *Scientific Reasoning and Problem Solving*

PSO 3: design and develop computer programs using programming languages efficiently, in the areas related to database management, mobile applications, operating systems and web design.

PO4 - *Critical Thinking and Analytical Reasoning*

PSO 4: analyse real world problems, identify and formulate the computing requirements appropriate to give efficient and constructive solutions in different research fields of Computer

Science and for environmental sustainability.

PO5 - *Digital Literacy, Self - directed and Lifelong Learning*

PSO 5.a: create high quality e-content for demonstrating complex concepts ; pursue the appropriate Massive Open Online Courses.

PSO 5.b: adapt to an ever-changing technological landscape either by pursuing higher studies and engaging in independent and life-long learning or use their potential in their career or entrepreneurial endeavours.

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PO6 - *Cooperation/Team Work and Multi-Cultural Competence*

>   **PSO 6:** demonstrate the knowledge of technological and management principles to work as a member or leader, with multicultural competence in diverse teams of software projects.

PO7 - *Moral and Ethical Awareness*

>   **PSO 7**: develop innovative applications as an employee of a company or an entrepreneur, employing contemporary technologies adhering to ethical, security and legal issues of Internet and Cyber systems.

PO-PEO Mapping Matrix

Attainment of PEOs can be measured by a PO-PEO matrix. PEOs should evolve through constant feedback from alumnae, students, industry, management, *etc*. It is mandatory that each PEO should be mapped to at least one of the POs.

PEOs POs/PSOs	PEO1	PEO2	PEO3
PO1/PSO1.a	-	✓	✓
PO1/PSO1.b	✓	✓	✓
PO2/PSO2.a	✓	✓	-
PO2/PSO2.b	✓	✓	-
PO3/PSO3	-	✓	✓
PO4/PSO4.a	-	✓	✓
PO4/PSO4.b	✓	✓	-
PO5/PSO5	✓	✓	-
PO6/PSO6	-	✓	✓
PO7/PSO7	-	-	✓

B.1.4 Course Outcomes (COs)

Course Outcomes are narrow statements restricted to the Course contents given in five units. Course Outcomes describe what students would be capable of, after learning the contents of the Course. They reflect the level of knowledge gained, skills acquired and attributes developed by the students after learning of Course contents. COs are measurable, attainable and manageable in number. COs contribute to attain POs in such a way that each CO addresses at least one of the POs and also each PO is reasonably addressed by adequate number of COs.
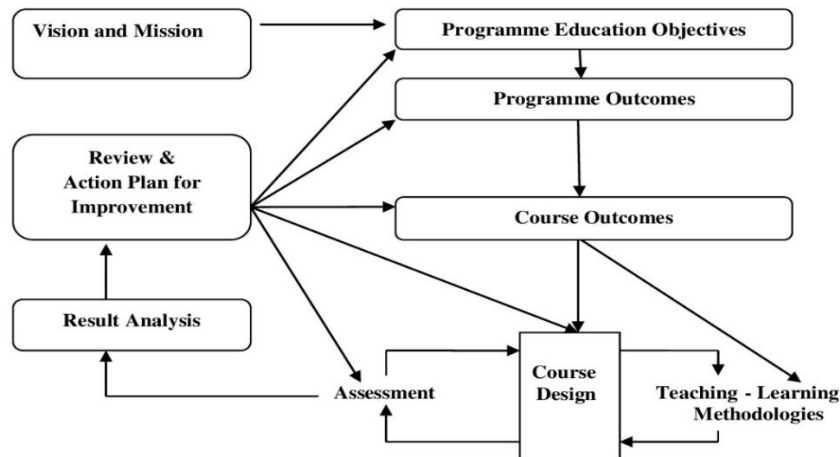
It is important to determine the methods of assessment. A comprehensive assessment strategy may be outlined using the revised Bloom's Taxonomy levels.

BLOOM'S TAXONOMY
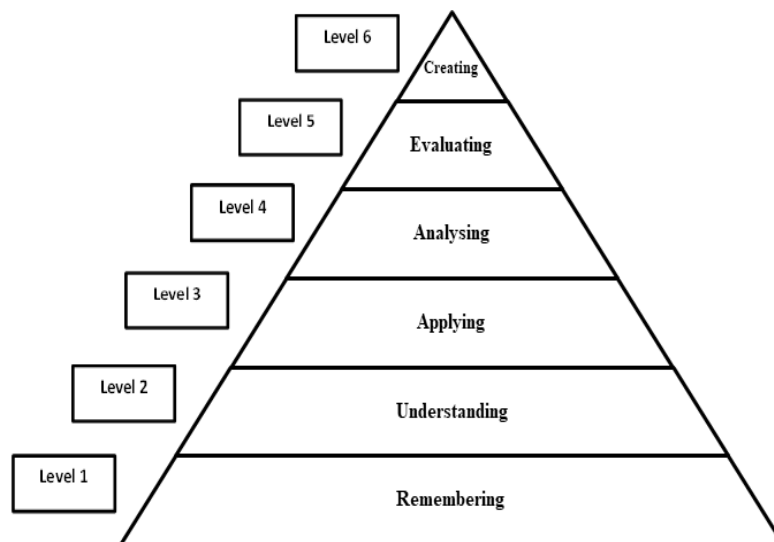
CO – PO Mapping of Courses

After framing the CO statements, the COs framed for each Course is mapped with POs based on the relationship that exists between them. The COs which are not related to any of the POs is indicated with (-), signifying Nil. Measurement Mapping is based on Four Points Scale [High (H), Medium (M), Low (L) and Nil (-)]. For calculating weighted percentage of contribution of each Course in the attainment of the respective POs, the weights assigned for H, M and L are 3, 2and 1 respectively.

CO-PO/PSO Mapping Table (Course Articulation Matrix)

PO/PSOs COs	PO1/ PSO1	PO2/ PSO2	PO3/ PSO3	PO4/ PSO4	PO5/ PSO5	PO6/ PSO6	PO7/ PSO7
CO1							
CO2							
CO3							
CO4							
CO5							

ELIGIBILITY FOR ADMISSION

The Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Tamil Nadu or any other examination accepted by Academic Council with Mathematics as one of the subjects.

DURATION OF THE PROGRAMME

The candidates shall undergo the prescribed Programme of study for a period of three academic years (six semesters).

MEDIUM OF INSTRUCTION

English

COURSES OFFERED

Part I	:	Tamil/Hindi Course
Part II	:	English
Part III	:	Core Courses
		Elective Courses • Generic Elective Courses • Discipline Specific Elective Courses
		Self Study Course - online
Part IV	:	Skill Enhancement Courses (SEC)
		Elective Course (NMEC)
		Environmental Studies Value Education
		Field Project/Internship
		Self Study Course - online
Part V	:	National Service Scheme/ Physical Education/ Youth Red Cross Society/ Red Ribbon Club/ Science Forum/ Eco Club/ Library and Information Science/ Consumer Club/ Health and Fitness Club/ National Cadet Corps/ Rotaract Club

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B.2 EVALUATION SCHEME

B.2.1.PART II

Components	Internal Assessment Marks	Summative Examination Marks	Total Marks
Theory	15	60	100
Practical	5	15	
Assignment	5	-	

Three Periodic Tests - Average of the best two will be considered

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B.2.2.Part I & PART III - Core Courses, Elective Courses (Generic, DSEC)

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Theory	25	75	**100**

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			Marks
Periodic Test		:	15
Assignment	K3 Level	:	5
Quiz	K1 Level	:	5
Total		**:**	**25**

Three Periodic Tests   - Average of the best two will be considered

Two Assignments   - Better of the two will be considered

Three Quiz Tests   - Best of the three will be considered

Practical

Mode of Evaluation		Marks
Model Test	:	30
Record & Performance	:	10
Total	**:**	**40**

Two Model Tests - Average of the two will be considered

Question Pattern for Internal Tests   **Duration: 2 Hours**

Section	Q. No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 4	Multiple Choice	4	4	1	4
B	5 -6	Internal Choice - Either … or Type	3	3	7	21
C	8 -9	Internal Choice - Either… or Type	2	2	10	20
					Total	**45***

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Question Pattern   **Duration: 3 Hours**

Section	Q. No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 -10	Multiple Choice	10	10	1	10
B	11 - 15	Internal Choice – Either …or Type	5	5	7	35
C	16 - 18	Internal Choice – Either… or Type	3	3	10	30
					Total	**75**

PROJECT

Assessment by Internal Examiner Only

Internal Assessment

Distribution of Marks

Mode of Evaluation	:	Marks
Project work and Report	:	60
Presentation and Viva –Voce	:	40
Total	**:**	**100**

B.2.3 PART IV - Skill Enhancement Courses, Non Major Elective Courses and Foundation Course

B.2.3.1 FOUNDATATION COURSE

INTERNAL ASSESSMENT
Distribution of Marks
Theory

Mode of Evaluation			Marks
Periodic Test		:	15
Assignment	K2 Level	:	5
Quiz	K1 Level	:	5
Total		**:**	**25**

Three Periodic Tests - Average of the best two will be considered

Two Assignments   - Better of the two will be considered

Three Quiz Tests   - Best of the three will be considered

Question Pattern for Periodic Tests   **Duration: 1 Hour**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 3	Internal Choice - Either …or Type	3	3	5	15
B	4	Internal Choice – Either …or Type	1	1	10	10
			Total			**25***

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Mode of Evaluation		Marks
Summative Examination	:	50
Online Quiz	:	25
(Multiple Choice Questions - K2 Level)		
Total	**:**	**75**

Question Pattern   **Duration: 2 Hours**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 5	Internal Choice - Either … or Type	5	5	6	30
B	6 - 7	Internal Choice – Either… or Type	2	2	10	20
	Total					50

B.2.3.2 Skill Enhancement Course - Entrepreneurial skills

INTERNAL ASSESSMENT ONLY
Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	15
Assignment	:	5
Quiz	:	5
Model Examinations	:	60
Online Quiz (Multiple Choice Questions - K2 Level)	:	15
Total	**:**	**100**

Question Pattern for Periodic Tests   **Duration: 1 Hour**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 3)	Internal Choice – Either Or Type	3	3	6	18
B Q. No.(4)	Internal Choice – Either Or Type	1	1	12	12
Total					**30**

Two Periodic Tests - Better of the two will be considered

Two Assignments   - Better of the two will be considered

Question Pattern for Model Examination   **Duration: 2 Hours**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1-5)	Internal Choice – Either Or Type	5	5	6	30
B Q. No.(6- 8)	Internal Choice – Either Or Type	3	3	10	30
Total					**60**

B.2.3.3 Skill Enhancement Courses/ Non Major Elective Courses

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			Marks
Periodic Test		:	15
Assignment	K3 Level	:	5
Quiz	K2 Level	:	5
Total		**:**	**25**

Three Periodic Tests - Average of the best two will be considered

Two Assignments   - Better of the two will be considered

Three Quiz Tests   - Best of the three will be considered

Question Pattern for Periodic Tests   **Duration: 1 Hour**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 3	Internal Choice - Either …or Type	3	3	5	15
B	4	Internal Choice – Either …or Type	1	1	10	10
	Total					**25***

*The total marks obtained in the Periodic Test will be calculated for 15 marks

SUMMATIVE EXAMINATION

Mode of Evaluation		Marks
Summative Examination	:	50
Online Quiz	:	25
(Multiple Choice Questions - K2 Level)		
Total	**:**	**75**

Question Pattern   **Duration: 2 Hours**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 5	Internal Choice - Either … or Type	5	5	6	30
B	6 - 7	Internal Choice – Either… or Type	2	2	10	20
	Total					**50**

B.2.4 PART IV- ENVIRONMENTAL STUDIES / VALUE EDUCATION
INTERNAL ASSESSMENT ONLY
Evaluation Pattern

Mode of Evaluation		Marks
Periodic Test	:	15
Assignment (Based on the Listed activities) - K3 Level	:	10
Online Quiz (Multiple Choice Questions - K2 Level)	:	25
Poster Presentation - K3 Level		10
Report on Student's Awareness creation on Environmental Protection / Ethical Values -- K3 Level		10
Model Examination	:	30
Total	**:**	**100**

Three Assignment   - Best of the three will be considered

Question Pattern for Periodic Tests   **Duration: 1 Hour**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 3)	Internal Choice – Either Or Type	3	3	6	18
B Q. No.(4)	Internal Choice – Either Or Type	1	1	12	12
Total					**30**

Two Periodic tests   - Better of the two will be considered

*The total marks obtained in the Periodic Test will be calculated for 15 marks

Question Pattern for Model Examination   **Duration: 2 ½ Hours**

Section	Q.No.	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A	1 - 5	Internal Choice - Either … or Type	5	5	6	30
B	6 - 8	Internal Choice – Either… or Type	3	3	10	30
	Total					**60***

*The total marks obtained in the Model Examination will be calculated for 30 marks

B.2.5 PART IV- Internship/ Field Project

Internship / Field Project is compulsory for II year UG Science Students

- **Internship:** A designated activity that carries one credit involving not less than 15 days of working in an organization under the guidance of an identified mentor

- **Field Project:** Students comprising of maximum 5 members in a team need to undertake project that involve conducting surveys inside/outside the college premises and collection of data from designated communities or natural places.

- Assessment by Internal Examiner only

Mode of Evaluation		Marks
Onsite Learning/Survey	:	50
Report	:	25
Viva-Voce	:	25
Total		**100**

B.2.6 SELF STUDY COURSE

B.2.6 .1 PART III - Core & Elective Courses Quiz – Online

- Assessment by Internal Examiner only

- Question Bank is prepared by the Faculty Members of the Departments for all the Core and Elective Courses offered in all the Semesters.

- No. of Questions to be taken 700.

- Multiple Choice Question pattern is followed.

- Online Test will be conducted in VI Semester for 100 Marks.

- Model Examination is conducted after two periodic tests.

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	25
Model Examination	:	75
Total	**:**	**100**

Two Periodic Tests   - Better of the two will be considered

B.2.6 .2 PART IV - Practice for Competitive Examinations – Online

Assessment by Internal Examiner only

- Question Bank prepared by the Faculty Members of the respective Departments will be followed.

- Multiple Choice Question pattern is followed.

- Online Test will be conducted in V Semester for 100 Marks.

- Model Examination is conducted after two periodic tests.

Subject wise Allotment of Marks

Subject		Marks
Tamil	:	10
English	:	10
History	:	10
Mathematics	:	10
Current affairs	:	10
Commerce, Law & Economics	:	10
Physical Sciences	:	10
Life Sciences	:	15
Computer Science	:	5
Food and Nutrition	:	5
Sports and Games	:	5
Total	**:**	**100**

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	25
Model Examination	:	75
Total	**:**	**100**

Two Periodic Tests - Better of the two will be considered

B.2.7. Part V – Extension Activities

INTERNAL ASSESSMENT ONLY

Distribution of Marks

Mode of Evaluation		Marks
Attendance	:	5
Performance	:	10
Report/Assignment/Project/Camp/Practical	:	10
Total	**:**	**25***

*The marks obtained will be calculated for 100 marks

B.2.8 EXTRA CREDIT COURSES (OPTIONAL)

2.8.1 Extra Credit Course offered by the Department.

Assessment by Internal Examiner Only (To be conducted along with the III Periodic Test)

Distribution of Marks

Mode of Evaluation		Marks
Quiz (Multiple Choice Questions)	:	25
Model Examination	:	75
Total	**:**	**100**

Question Pattern for Model Examination

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q.No.(1-5)	Internal Choice- Either or Type	5	5	7	35
B Q.No.(6-9)	Internal Choice- Either or Type	4	4	10	40
				Total	**75**

2.8.2 Extra credit Course offered by MOOC (Massive Open Online Course)

➢ The Courses shall be completed within the first V Semesters of the Programme.

➢ The allotment of credits is as follows **(Maximum of 10 credits)**

4weeks Course   - 1 credit

8 weeks Course   - 2 credits

12 weeks Course   - 3 credits

ELIGIBILITY FOR THE DEGREE

• The candidate will not be eligible for the Degree without completing the prescribed Courses of study, lab work, *etc.,* and a minimum Pass marks in all the Courses.

➢ No Pass minimum for Internal Assessment.

➢ Pass minimum for External Examination is 27 marks out of 75 marks for Core Courses, Elective Courses (Generic Elective, DSEC Courses)

➢ Pass minimum for External Examination is 18 marks out of 50 marks for Skill Enhancement Courses and Non Major Elective Courses (NMEC).

➢ The aggregate minimum pass percentage is 40.

➢ Pass minimum for External Practical Examination is 21 marks out of 60 marks.

➢ Pass minimum for Ability Enhancement Compulsory Courses is 40 marks.

➢ Pass minimum for Self Study Courses is 40 marks.

- Attendance

  ➢ For UG, PG Programmes,

  a) The students who have attended the classes for 76 days (85%) and above are permitted to appear for the Summative Examinations without any condition.

  b) The students who have only 60-75 days (66% - 84%) of attendance are permitted to appear for the Summative Examinations after paying the required fine amount and fulfilling other conditions according to the respective cases.

  c) The students who have attended the classes for 59 days and less – upto 45 days (50% - 65%) can appear for the Summative Examinations only after getting special permission from the Principal.

  d) The students who have attended the classes for 44 days or less (<50%) cannot appear for the Summative Examinations and have to repeat the whole semester.

    ➢ For Part V in UG Programmes, the students require 75 % of attendance to get a credit.

    ➢ For Certificate, Diploma, Advanced Diploma and Post Graduate Diploma Programmes, the students require 75% of attendance to appear for the Theory/Practical Examinations.

    These rules come into effect from 2023-2024 onwards.

B.3 ASSESSMENT MANAGEMENT PLAN

An Assessment Management Plan that details the assessment strategy both at the Programme and the Course levels is prepared. The continuous assessment is implemented using an assessment rubric to interpret and grade students.

B.3.1 Assessment Process for CO Attainment

Assessment is one or more processes carried out by the institution that identify, collect and prepare data to evaluate the achievement of Course Outcomes and Programme Outcomes. Course Outcome is evaluated based on the performance of students in the Continuous Internal Assessments and in End Semester Examination of a Course. Target levels of attainment shall be fixed by the Course teacher and Heads of the respective departments.

Direct Assessment (Rubric based) - Conventional assessment tools such as Term Test, Assignment, Quiz and End Semester Summative Examination are used.

Indirect Assessment – Done through Course Exit Survey.

CO Assessment Rubrics

For the evaluation and assessment of COs and POs, rubrics are used. Internal assessment contributes 40% and End Semester assessment contributes 60% to the total attainment of a CO for the theory Courses. For the practical Courses, internal assessment contributes 50% and Semester assessment contributes 50% to the total attainment of a CO. Once the Course Outcome is measured, the PO can be measured using a CO-PO matrix.

CO Attainment

Direct CO Attainment

Course Outcomes of all Courses are assessed and the CO – wise marks obtained by all the students are recorded for all the assessment tools. The respective CO attainment level is evaluated based on set attainment rubrics

Target Setting for Assessment Method

For setting up the target of internal assessment tools, 55% of the maximum mark is fixed as target. For setting up the target of End Semester Examination, the average mark of the class shall be set as target.

Formula for Attainment for each CO

Attainment = Percentage of students who have scored more than the target marks

$$\text{Percentage of Attainment} = \frac{\text{Number of Students who scored more than the Target}}{\text{Total Number of Students}} \times 100$$

Attainment Levels of COs

Assessment Methods	Attainment Levels	
Internal Assessment	Level 1	50% of students scoring more than set target marks in Internal Assessment tools
	Level 2	55% of students scoring more than set target marks in Internal Assessment tools
	Level 3	60% of students scoring more than set target marks in internal Assessment tools
End Semester Summative Examination	Level 1	50% of students scoring more than average marks in End Semester Summative Examination
	Level 2	55% of students scoring more than average marks in End Semester Summative Examination
	Level 3	60% of students scoring more than average marks in End Semester Summative Examination

Indirect CO Attainment

At the end of each Course, an exit survey is conducted to collect the opinion of the students on attainment of Course Outcomes. A questionnaire is designed to reflect the views of the students about the Course Outcomes.

Overall CO Attainment= 75% of Direct CO Attainment + 25 % of Indirect CO Attainment

In each course, the level of attainment of each CO is compared with the predefined targets. If the target is not reached, the Course teacher takes necessary steps for the improvement to reach the target.

For continuous improvement, if the target is reached, the Course teacher can set the target as a value greater than the CO attainment of the previous year.

B.3.2 Assessment Process for Overall PO Attainment

With the help of CO against PO mapping, the PO attainment is calculated. PO assessment is done by giving 75% weightage to direct assessment and 25% weightage to indirect assessment. Direct assessment is based on CO attainment, where 75% weightage is given to attainment through End Semester Examination and 25% weightage is given to attainment through Internal assessments. Indirect assessment is done through Graduate Exit Survey and participation of students in Co-curricular/ Extra curricular activities.

PO Assessment Tools

Mode of Assessment	Assessment Tool	Description
Direct Attainment (Weightage -75%)	CO Assessment	This is computed from the calculated CO Attainment value for each Course
Indirect Attainment (Weightage - 25%)	Graduate Exit Survey 10%	At the end of the Programme, Graduate Exit Survey is collected from the graduates and it gives the opinion of the graduates on attainment of Programme Outcomes
	Co-curricular/ Extra-curricular activities 15%	For participation in Co-curricular/Extra-curricular activities during the period of their study.

Programme Articulation Matrix (PAM)

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Average Direct PO Attainment								
Direct PO Attainment in percentage								

Indirect Attainment of POs for all Courses

Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Graduate Exit Survey							
Indirect PO Attainment							

Attainments of POs for all Courses

Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Direct Attainment (Weightage - 75%)							
Indirect Attainment (Weightage - 25%)							
Overall PO Attainment							

Overall PO Attainment= 75% of Direct PO Attainment +

25% of Indirect PO Attainment (Graduate Exit Survey

& Participation in Co- curricular and

Extra curricular Activities)

Expected Level of Attainment for each of the Programme Outcomes

POs	Level of Attainment
Attainment Value ≥70%	Excellent
60% ≤ Attainment Value < 70%	Very Good
50% ≤ Attainment Value < 60%	Good
40% ≤ Attainment Value < 50%	Satisfactory
Attainment Value <40%	Not Satisfactory

Level of PO Attainment

Graduation Batch	Overall PO Attainment (in percentage)	Whether Expected Level of PO is Achieved? (Yes/No)

B.3.3 Assessment Process for PEOs

The curriculum is designed so that all the Courses contribute to the achievement of PEOs. The attainment of PEOs is measured after 5 years of completion of the Programme only through indirect methods.

Target for PEO Attainment

Assessment Criteria	Target (UG)	Target (PG)
Record of Employment	15% of the class strength	30% of the class strength
Progression to Higher Education	50% of the class strength	5% of the class strength
Record of Entrepreneurship	2% of the class strength	5% of the class strength

Attainment of PEOs

Assessment Criteria & Tool	Weightage
Record of Employment	10
Progression to Higher Education	20
Record of Entrepreneurship	10
Feedback from Alumnae	30
Feedback from Parents	10
Feedback from Employers	20
Total Attainment	**100**

$$\text{Percentage of PEO Attainment from Employment} = \frac{\text{Number of Students who have got Employment}}{\text{Target}} \times 100$$

$$\text{Percentage of PEO Attainment from Higher Education} = \frac{\text{Number of Students who pursue Higher Education}}{\text{Target}} \times 100$$

$$\text{Percentage of PEO Attainment from Entrepreneurship} = \frac{\text{Number of Students who have become Entrepreneurs}}{\text{Target}} \times 100$$

Expected Level of Attainment for each of the Programme Educational Objectives

POs	Level of Attainment
Attainment Value ≥70%	Excellent
60% ≤ Attainment Value < 70%	Very Good
50% ≤ Attainment Value < 60%	Good
40% ≤ Attainment Value < 50%	Satisfactory
Attainment Value <40%	Not Satisfactory

Level of PEO Attainment

Graduation Batch	Overall PEO Attainment (in percentage)	Whether Expected Level of PEO is Achieved? (Yes/No)

C. PROCESS OF REDEFINING THE PROGRMME EDUCATIONAL OBJECTIVES

The college has always been involving the key stakeholders in collecting information and suggestions with regard to curriculum development and curriculum revision. Based on the information collected the objectives of the Programme are defined, refined and are inscribed in the form of PEOs. The level of attainment of PEOs defined earlier will be analysed and will identify the need for redefining PEOs. Based on identified changes in terms of curriculum, regulations and PEOs, the administrative system like Board of Studies, Academic Council and Governing Body may recommend appropriate actions. As per the Outcome Based Education Framework implemented from the Academic Year 2020 -2021, the following are the Programme Structure, the Programme Contents and the Course Contents of B.Sc. Computer Science Programme.

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BACHELOR OF SCIENCE
COMPUTER SCIENCE (UG) (2019)
Outcome Based Education with Choice Based Credit System
Programme Structure - Allotment of Hours and Credits
For those who joined in the Academic Year 2024-2025 and after

Components	Semester						Total Number of Hours
	I	II	III	IV	V	VI	
Part I : Tamil /Hindi	6 (3)	6 (3)	6 (3)	6 (3)	-	-	24 (12)
Part II : English	6 (3)	6(3)	6 (3)	6 (3)	-	-	24 (12)
Part III : Core Courses, Elective Courses & Self Study Course							
Core Course	5 (5)	5 (5)	5 (5)	5 (5)	5 (4)	5 (4)	30 (28)
Core Course	-	-	-	-	5 (4)	5 (4)	10 (8)
Core Course	-	-	-	-	5 (4)	5(4)	10(8)
Core Course Practical	5(3)	5 (3)	5(3)	4 (3)	4 (3)	5 (3)	28(18)
Core Course Project	-	-	-	-	1 (3)	-	1 (3)
Elective Course (DSEC)	-	-	-	-	5 (3)	5 (3)	10 (6)
Elective Course (DSEC Practical)	-	-	-	-	3(2)	3(2)	6(4)
Elective Course I (Allied)	4 (4)	4 (4)	4 (4)	4 (4)	-	-	16(16)
Elective Course I Practical I(Allied)	-	-	-	-	-	-	-
Elective Course II(Allied)	-	-			-	-	-
Elective Course II Practical II(Allied)	-	-			-	-	-
Self Study Course	-	-	-	-	-	0 (1)	0 (1)
Part IV : Skill Enhancement Courses, Elective Courses, Environmental Studies, Value Education, Self Study Course &Internship/ Field Project							
SEC	2 (2)	-	1 (1)	2 (2)	-	-	5(5)
SEC	-	2 (2)	2 (2)	2 (2)	-	2 (2)	8 (8)
Elective Course(NME)	2 (2)	2 (2)	-	-	-	-	4 (4)
AECC - Value Education	-	-	-	-	2 (2)	-	2 (2)
AECC - Environmental Studies	-	-	1 (0)	1 (2)	-	-	2 (2)
Self Study Course	-	-	-	-	0 (1)	-	0 (1)
Internship/ Field Project	-	-	-	-	0 (1)	-	0 (1)
Part V : Extension Activities	-	-	-		-	0 (1)	0 (1)
Total	**30 (22)**	**30 (22)**	**30(21)**	**30 (24)**	**30 (27)**	**30(24)**	**180 (140)**
Extra Credit Course (Self Study Course)	**-**	**-**	**-**	**-**	0(2)	**-**	0(2)

DSEC: Discipline Specific Elective Course   SEC: Skill Enhancement Course
NMEC: Non Major Elective Course

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B.Sc. COMPUTER SCIENCE -2019
PROGRAMME CONTENT

SEMESTER I

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1	**Part I**		Tamil/ Hindi	24UTAG11/ 24UHDG11	6	3	3	25	75	100
2	**Part II**		English	24UENG11	6	3	3	25	75	100
3	**Part III**	Core Course - 1	Python Programming	24UCSC11	5	5	3	25	75	100
4		Core Course - 2 Practical – I	Python Programming Practical	24UCSC11P	5	3	3	40	60	100
5		Elective Course - 1	Discrete Mathematics - I	24UCSA11	4	4	3	25	75	100
6	**Part IV**	Elective Course NME - 1	Office Automation	24UCSN11	2	2	2	25	75	100
7		SEC - 1 Foundation Course	Problem Solving Techniques	24UCSF11	2	2	2	25	75	100
				Total	**30**	**22**				**700**

SEMESTER II

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1	**Part I**		Tamil/ Hindi	24UTAG21/ 24UHDG21	6	3	3	25	75	100
2	**Part II**		English	24UENG21	6	3	3	25	75	100
3	**Part III**	Core Course - 3	Programming in C	24UCSC21	5	5	3	25	75	100
4		Core Course - 4 Practical – II	Programming using C Practical	24UCSC21P	5	3	3	40	60	100
5		Elective Course -3	Statistical Methods and its Applications	24UCSA21	4	4	3	25	75	100
6	**Part IV**	Elective Course NME - 2	Introduction to HTML	24UCSN21	2	2	2	25	75	100
7		SEC - 2	Digital Principles	24UCSS21	2	2	2	25	75	100
				Total	**30**	**22**				**700**

SEMESTER III

Sl. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	**Part I**		Tamil/ Hindi	24UTAG31/ 24UHDG31	6	3	3	25	75	100
2.	**Part II**		English	24UENG31	6	3	3	25	75	100
3.	**Part III**	Core Course – 5	Data Structures and Algorithms	24UCSC31	5	5	3	25	75	100
4.		Core Course – 6 Practical – III	Data Structures and Algorithms Practical	24UCSC31P	5	3	3	40	60	100
5.		Elective Course - 5	Numerical Methods	24UCSA31	4	4	3	25	75	100
6.	**Part IV**	SEC – 3 Practical - I	DTP Practical	24UCSS31P	1	1	2	100	-	100
7.		SEC – 4 Practical – II	Web Designing Practical	24UCSS32P	2	2	2	40	60	100
8.			Environmental Studies	24UGES41	1	-	-	-	-	-
			Total		**30**	**21**				**700**

SEMESTER IV

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	**Part I**		Tamil/ Hindi	24UTAG41/ 24UHDG41	6	3	3	25	75	100
2.	**Part II**		English	24UENG41	6	3	3	25	75	100
3.	**Part III**	Core Course – 7	Java Programming	24UCSC41	5	5	3	25	75	100
4.		Core Course – 8 Practical – IV	Java Programming Practical	24UCSC41P	4	3	3	40	60	100
5.		Elective Course - 6	Resource Management Techniques	24UCSA41	4	4	3	25	75	100
6.	**Part IV**	SEC – 5	Computer Organization	24UCSS41	2	2	2	25	75	100
7.		SEC – 6 Practical – III	PHP Programming Practical	24UCSS41P	2	2	2	40	60	100
8			Environmental Studies	24UGES41	1	2	2	100	-	100
			Total		**30**	**24**				**800**

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S.No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	**Part III**	Core Course – 9	Database Management Systems	24UCSC51	6	5	3	25	75	100
3.		Core Course – 10	Computer Networks	24UCSC52	6	5	3	25	75	100
4.		Core Course – 11 Practical – V	Database Management Systems Practical	24UCSC51P	5	3	3	40	60	100
5.		Core Course – 12	Project	24UCSC54PR	1	3	-	100	-	100
6.		Elective Course - 7	Operating System Concepts / Introduction to Data Science/ Artificial Intelligence	24UCSE51 24UCSE52 24UCSE53	5	4	3	25	75	100
7.		Elective Course – 8 DSEC Practical - 1	Artificial Intelligen using AI Tools Practical / Operating System Practical/ Data Science Practical	24UCSE51P 24UCSE52P 24UCSE53P	5	3	3	40	60	100
8.	**Part IV**		Value Education	24UGVE51	2	2	2	100	-	100
9.		Self Study Course	Practice for Competitive Examinations - Online	24UGCE51	-	1	-	100	-	100
10.			Internship/ Industrial Training	24UCSI51G	-	1	-	100	-	100
			Total		**30**	**27**				**1000**
		Extra Credit Course	C and C++ Aptitude	24UCSO51	-	2	-	100	-	100

SEMESTER V

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SEMESTER VI

S. No.	Components		Title of the Course	Course Code	Hours Per Week	Credits	Exam. Hours	Marks		
								Int.	Ext.	Total
1.	**Part III**	Core Course – 13	Mobile Applications Development	24UCSC61	6	5	3	25	75	100
3.		Core Course – 14	Data Analytics using R	24UCSC62	6	5	3	25	75	100
4.		Core Course – 15 (Practical – VI)	Mobile Applications Development Practical	24UCSC61P	6	3	3	40	60	100
5.		Elective Course - 9	Image Processing/ IoT and its Applications/ Multimedia	24UCSE61 24UCSE62 24UCSE63	5	4	3	25	75	100
6.		Elective Course – 10 DSEC Practical - II	Image Processing Practical/ IoT Practical/ Multimedia Practical	24UCSE61P 24UCSE62P 24UCSE63P	5	3	3	40	60	100
7.		Self Study Course	Core Courses Quiz- Online	24UCSQ61	-	1	-	100	-	100
8.	**Part IV**	SEC 7 Practical – IV Professional Competency Skill Enhancement Course	Advanced Excel Practical	24UCSS61P	2	2	2	40	60	100
9.	**Part V**		Extension Activities		-	1	-	100	-	100
				Total	**30**	**24**				**900**

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B.Sc. Computer Science
(for those who join in 2024 - 2025)

Semester I	**PYTHON PROGRAMMING**	Hours/Week: 5	
Core Course - 1		Credits: 5	
Course Code **24UCSC11**		Internal 25	External 75

Course Outcomes:

On completion of the course, students will be able to

CO1: describe fundamental concepts in Python programming. [K1]

CO2: interpret the concepts of basic Python, functions, operations on files and string manipulation. [K2]

CO3: infer looping, control statements and representation of complex data using lists, tuples and dictionaries. [K2]

CO4 apply the concepts of basic programming, functions, strings, modules and file handling in Python programs. [K3]

CO5: determine the methods to develop Python programs utilizing control statements, jump statements, list, tuples and dictionaries. [K3]

UNIT I

Basics of Python Programming: History of Python – Features of Python – Literal Constants - Variables and Identifiers - Data types – Input operations- Comments – Indentation – Operators and Expressions – Type conversions. (15 Hours)

UNIT II

Decision Control Statements: Selection / Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Basic Loop Structures/Iterative Statements: while loop, for loop - nested loops. (15 Hours)

UNIT III

Functions and Modules: Function Declaration and Definition – Function Call – Variable Scope and its Lifetime-Return Statement **-** More on Defining Function - Required arguments, Keyword

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Arguments, Default arguments and Variable length arguments- Recursion. Modules: The from import statement– Name of the modules – Making your own modules. **Python Strings Revisited :** Concatenating, appending and multiplying Strings - String are Immutable – Built-in String Methods and Functions –   Comparison Strings.

(15 Hours)

UNIT IV

Data Structures: Lists: Access values in List- Updating values in Lists- Nested lists –Cloning Lists - Basic list operations - List Methods. Tuples: Creating Tuples - Accessing values in a Tuples, Updating Tuples - Deleting Elements in Tuple – Nested Tuples– Advantages of Tuples over Lists. Dictionaries**:** Creating a Dictionaries, Adding and Modifying an item in a Dictionaries – Modifying an entry – Deleting items   – Built-in Dictionary Functions and Methods - Difference between Lists and Dictionaries.

(15 Hours)

UNIT V

 File Handling: Types of Files - Opening and Closing Files - Reading and Writing Files: write() and writelines() Methods- append() Method – read() and readlines() Methods – Opening Files with keyword – Splitting words – some other useful File Methods - File Positions- Renaming and deleting files.   (15 Hours)

SELF-STUDY: (Not included for Examination)

Jump Statements: break, continue and pass statements (Page Nos. 167 – 172)

TEXT BOOK

Reema Thareja. (2017). *Python Programming using problem solving approach*, 1st Edition, Oxford University Press.

Unit	Chapter	Sections
I	3	3.1, 3.2, 3.5-3.9, 3.11, 3.12, 3.16
II	4	4.2 – 4.4
III	5 6	5.2-5.6, 5.10, 5.11.1-5.11.3 6.1, 6.2, 6.4, 6.8
IV	8	8.2.1- 8.2.6, 8.4.1, 8.4.3-8.4.6, 8.4.9, 8.4.16, 8.6.1-8.6.4, 8.6.8, 8.6.9
V	7	7.3-7.7

REFERENCE BOOKS

1. Vamsi Kurama. *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.

WEB RESOURCES

1. https://www.programiz.com/python-programming

2. https://www.guru99.com/python-tutorials.html

3. https://www.w3schools.com/python/python_intro.asp

4. https://www.geeksforgeeks.org/python-programming-language/

5. https://en.wikipedia.org/wiki/Python_(programming_language)

Course Code 24UCSC11	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO 6	PSO 7
CO1	3	2	3	2	2	2	2	2	2	-
CO2	3	2	3	2	2	2	3	2	2	-
CO3	3	3	3	2	3	2	3	3	2	-
CO4	3	3	3	3	3	3	3	3	3	1
CO5	3	3	3	3	3	3	3	3	3	1

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi
Mrs. P. Aruna Devi   Mrs. P. Aruna Devi
Heads of the Departments   **Course Designer**

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Semester I		Hours/Week: 5	
Core Course - 2 Practical – I	**PYTHON PROGRAMMING PRACTICAL**	Credits: 3	
Course Code **24UCSC11P**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: write Python programs using I/O statements and various operators of Python. [K2]

CO2: draw flow chart and write programs with various program structures of Python, functions and modules. [K2]

CO3: demonstrate data representation using Arrays, Strings, List, Tuple, Dictionaries and Files in Python. [K3]

CO4: demonstrate various programs with different inputs and complete the record work. [K3]

CO5: explore the uses of Python compound data in real life. [K3]

Write Python Programs for the following concepts:

1. variables, constants, I/O statements.

2. Operators.

3. Conditional Statements.

4. Loops.

5. Jump Statements.

6. Arrays.

7. Strings.

8. Functions.

9. Recursion.

10. Modules.

11. Lists.

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12. Tuples.

13. Dictionaries.

14. File Handling.

Course Code 24UCSC11P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO 6	PSO 7
CO1	3	3	1	1	2	2	2	1	1	-
CO2	3	3	1	1	2	2	2	1	1	-
CO3	3	3	3	2	2	3	2	3	1	1
CO4	3	3	2	2	2	3	2	2	1	1
CO5	3	3	3	3	3	3	2	3	1	1

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi
Mrs. P. Aruna Devi   Mrs. P. Aruna Devi
Heads of the Departments   **Course Designer**

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B.Sc. Computer Science

(for those who join in 2024 - 2025)

Semester I		Hours/Week: 4	
Elective Course	**DISCRETE MATHEMATICS - I**	Credits: 4	
Course Code **24UCSA11**		Internal 25	External 75

COURSE OUTCOMES

On completion of the course the students will be able to

CO1: define the basic concepts in propositional logic, relations, counting, graph theory and Matrices. [K1]

CO2: understand the mathematical concepts in logic, relations, permutation and combinations, graphs and matrices. [K2]

CO3: explain the concepts in predicates and quantifiers, partial orderings, recurrence relations, graphs and matrices. [K2]

CO4: solve problems in discrete mathematics. [K3]

CO5: apply the knowledge gained in discrete mathematics to other fields [K3]

UNIT I

The Foundations: Logic and Proofs: Propositional logic − Applications of Propositional logic − Propositional equivalences − (Exclude Propositional satisfiability, Applications of satisfiability, Solving satisfiability problems, and its related problems) − Predicates and Quantifiers.

(12 hours)

UNIT II

Relations: Relations and their properties − Representing relations −Partial orderings (Theorems statement only; Exclude lexicographic ordering - Exclude Lattices and Topological sorting)

(12 hours)

UNIT III

Counting: The basic of counting - The pigeonhole principle (Exclude Generalized Pigeon hole principle, some elegant applications of the pigeonhole principle) – Permutation and Combinations – Applications of recurrence relations (Exclude algorithms and recurrence relations-solving linear recurrence relations (Exclude linear non-homogeneous recurrence relation with constant coefficients) (All theorems and Results statement only)   (12 hours)

UNIT IV

Graphs: Graphs and Graphs models, (Excluding Biological networks; Tournaments; all its related examples and problems) – Graph terminology and special types of graphs (Theorem statement only, exclude some applications of special types of graphs, new graphs from old) – Representing graphs and Graph isomorphism – Connectivity -Paths – connectedness in undirected graphs (Exclude how connected is a graph?, connectedness in directed graphs) – paths and isomorphism – counting paths between vertices – shortest path problems.   (12 hours)

UNIT V

Matrices: Introduction – operations – inverse – Rank of a matrix, solution of simultaneous linear equations – Eigen values and Eigen Vectors.   (12 hours)

TEXT BOOKS

1. Kenneth.H.Rosen (2012), *Discrete Mathematics and its applications*, Seventh Edition, McGraw-Hill Publishing Company.

2. Venkataraman.M, Sridharan.N and Chandrasekaran.N (2009) *Discrete Mathematics*, The National Publishing Company.

REFERENCE BOOKS:

1. Arumugam S & Thangapandi Isaac A. (2005). *Modern Algebra*, Scitech Publications.

2. Arumugam S & Ramchandran S. (2005). *Invitation to Graph Theory*, Scitech Publications, Chennai.

3. Trembley and Manuhar.(1997). *Discrete Mathematical Structures with Applications to Computer Science*, McGraw Hill.

WEB RESOURCES

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

Course Code 24UCSA11	PO1	PO2	PO3	PO4	PO5	PO 6	PO7
CO1	3	2	3	1	-	1	-
CO2	3	1	3	3	3	1	-
CO3	3	3	3	3	2	1	-
CO4	3	1	3	3	2	3	-
CO5	3	3	3	2	3	3	-

Strong(3)   Medium(2)   Low(1)

Dr.M.C. Maheswari   Dr.S.Kohila

Head of the Department   **Course Designer**

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

(Belonging to Virudhunagar Hindu Nadars)
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Re-accredited with 'A++' Grade (4th Cycle) by NAAC
VIRUDHUNAGAR
Quality Education with Wisdom and Values

B.Sc. Computer Science
(for those who join in 2024 - 2025)

Semester I		Hours/Week: 2	
Elective Course NME – I	**OFFICE AUTOMATION**	Credits: 2	
Course Code **24UCSN11**		Internal 25	External 75

Course Outcomes:
On completion of the course, students will be able to

CO1: outline the working of word processing, spreadsheet and power point presentation. [K1]

CO2: recognize the creation of tables in document, creation of charts in spreadsheet and animation effects in a presentation. [K1]

CO3: describe the basics elements of word, spread sheet, chart and power point slides. [K2]

CO4: illustrate the various formatting options in word document, spread sheet and inclusion of multimedia content in power point presentation. [K2]

CO5: experiment the usage of word processing, spreadsheet, and power point presentation in effective office automation. [K3]

UNIT I

   Getting Started with Microsoft Word 2013: Creating a New Word Document − Saving a Word Document – Apply Basic Formatting - Applying Bulleted and Numbered List – Using Cut, Copy and Paste Commands - Using Find, Replace and GoTo Commands.   (6 Hours)

UNIT II

   Working with Graphics and Tables: Working with Basic Graphic Objects – Inserting a Picture – Inserting Shape – Working with Tables.

   Designing and Reviewing a Word Document: Setting Paragraph Indent and Spacing – Inserting Headers and Footers – Changing page setup options.   (6 Hours)

UNIT III

      Getting Started with Microsoft Excel 2013: Creating a New Excel Workbook – Saving an Excel Workbook – Adding Data to Cells – Adding Data using the AutoFill Feature – Modifying Cells, Rows, Columns and Worksheet – Hiding and Unhiding Rows and Columns – Wrapping Text – Changing Number Formats – Adding Border to Cells.   (6 Hours)

UNIT IV

      Working with Tables and Charts: Working with Tables – Working with Charts.

      Getting Started with Microsoft Powerpoint 2013: Creating a Presentation – Saving a Presentation – Adding and Removing Slides – Adding a Title and Subtitle to a Slide – Adding Text to a Slide using Textboxes.   (6 Hours)

UNIT V

      Enhancing PowerPoint Presentations: Changing the Layout of a Slide – Applying Background to a Slide – Applying Themes to a Presentation – Working with Basic Graphic Object – Inserting a picture.

      Building Dynamic PowerPoint Presentations: Adding, Copying, and Removing Animation Effects - Adding and Removing a Built-In Animation Effect - Working with Transitions: Adding a Transition effect to a Slide – Removing a Transition effect from a Slide.

        (6 Hours)

TEXT BOOK

      Kogent Learning Solutions Inc. (2015). "Office 2013 in Simple Steps", Dreamtech Press.

UNIT	CHAPTER	PAGE NO.
I	2	26 – 41, 46 – 54
II	3	61 – 64 , 85 – 95
	4	98 – 100, 104 - 106
III	5	128 -151
IV	6	163 – 169, 179 – 191
	8	217 – 227
V	9	243 – 252
	10	279 – 284, 294 – 298

REFERENCE BOOKS

1. Vishnu Priya Singh, *Exploring MS Office 2013*, Asian Compu Tech Book, 2nd Revised Edition.

2. Michael Price (2013), *Office 2013*, 1st Edition, McGraw Hill Education.

WEB RESOURCES

1. https://www.udemy.com/course/office-automation-certificate-course/

2. https://www.javatpoint.com/automation-tools

Course Code 24UCSN11	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	2	2	-	-
CO2	3	2	2	2	2	-	-
CO3	3	3	2	2	3	1	-
CO4	3	1	1	2	3	2	-
CO5	3	3	1	2	3	2	-

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi   Dr. R. Barani
Mrs. P. Aruna Devi   Ms. M. Porkalai Selvi
Heads of the Departments   **Course Designers**

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VIRUDHUNAGAR

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B.Sc. COMPUTER SCIENCE
(for those who join in 2024 - 2025)

Semester I		Hours/Week: 2	
SEC - 1 Foundation Course	**PROBLEM SOLVING TECHNIQUES**	Credits: 2	
Course Code **24UCSF11**		Internal 25	External 75

Course Outcomes:

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

CO1 : familiarize with basics of computer, programming languages, flowchart and program. [K1]

CO2 : realize the hardware components, software, steps in programming, concepts of programming and data structures. [K1]

CO3 : explain the need for data, different programming languages, programming structures and modules for problem solving. [K2]

CO4 : identify the use of hardware, software and the relationship between the program steps and flow of data in the program. [K2]

CO5 : explore various programming languages, programming structures to manipulate data and the use of flowcharts to write programs for the solution of a problem. [K2]

UNIT I

Introduction to Digital Computer: Introduction – Von Neumann Concept – Storage – Programming Languages – Translators – Hardware and Software – Operating Systems.

(6 Hours)

UNIT II

An Introduction to Computers and Programming: Creating Computer Program the Program Development Cycle **-** Basic Programming Concepts - Data Processing and Output. **Developing a Program:** Coding, Documenting and Testing a Program – Structured Programming. (6 Hours)

44

UNIT III

Selection Structures: Making Decisions: Relational and Logical Operators – Selecting from Several Alternatives - Applications of Selection Structures. **Repetition Structures: Looping:** Types of Loop – The For Loop. (6 Hours)

UNIT IV

Arrays: List and Tables: One Dimensional Arrays: Array Basics - Strings as Arrays of Characters - Two Dimensional Arrays. **Program Modules and Subprograms and Functions:** Data Flow Diagrams, Arguments and Parameters. (6 Hours)

UNIT V

Program Modules and Subprograms and Functions: More about Subprograms – Functions – Recursion. **Sequential Data Files:** An Introduction to Data Files - Modifying Sequential files. (6 Hours)

TEXT BOOKS

1. E. Balagurusamy. *Introduction to Computing and Problem Solving using Python,* 1st Edition, McGraw Hill Education (India) Private Limited

2. Stewart Venit, Elizabeth Drake. (2014)**.** *Prelude to Programming: Concepts and Design*, 5th Edition, Pearson Publishers.

BOOK	UNIT	CHAPTERS	SECTIONS
I	I	1	1.1-1.7
II	II	1	1-3
		2	3,5
	III	3	2,4,5
		4	2,3
	IV	6	1,4,5
		7	1
	V	7	2,3,4
		8	1,2

REFERENCE BOOKS

1. Karl Beecher. (2017). *Computational Thinking: A Beginner's Guide to Problem-Solving and Programming,* BCS Learning & Development Ltd.

2. Johan Sannemo. (2018). *Principles of Algorithmic Problem Solving,* KTH Royal Institute of Technology.

WEB RESOURCES

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

Course Code 24UCSF11	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO 6	PSO7
CO1	3	2	1	3	2	2	1	2	2	2
CO2	2	2	-	1	2	2	1	2	2	1
CO3	3	1	-	1	3	3	2	2	1	3
CO4	2	1	2	2	1	2	1	3	2	1
CO5	3	3	2	2	3	3	1	2	2	3

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi
Mrs. P. Aruna Devi   Ms. M. Porkalai Selvi
Heads of the Departments   **Course Designer**

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B.Sc. Computer Science
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Semester II		Hours/Week: 5	
Core Course - 3	**PROGRAMMING IN C**	Credits: 5	
Course Code **24UCSC21**		Internal 25	External 75

Course Outcomes:

On completion of the course, students will be able to

CO1: identify the features of C language. [K1]

CO2: interpret the concepts of data types, homogeneous data structures, functional models and file manipulation. [K2]

CO3: describe control structures, pointers, input and output operations in C. [K2]

CO4 apply the concepts of user-defined functions, strings, arrays, pointers and file management in C programs. [K3]

CO5: implement control & data structures in C. [K3]

UNIT I

Overview of C: Basic structure of C Programs. **Constants, Variables and Data Types:** Introduction- Character set – C Tokens – Keywords and Identifiers – Constants – Variables – Data types – Declaration of Variables – Assigning Values to Variables – Defining Symbolic Constants. **Operators and Expressions:** Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions. **Managing Input and Output Operations:** Introduction – Reading a Character – Writing a Character – Formatted Input – Formatted Output. (15 Hours)

UNIT II

Decision Making and Branching: Introduction – Decision Making with IF Statements - Simple IF Statement – The If…Else Statement – Nesting of If…Else

47

Statements–The Else If Ladder –The Switch Statement – The ? : Operator – The Go to Statement. **Decision Making and Looping:** Introduction – The While Statement – The Do Statement – The For Statement– Jumps in Loops.   (15 Hours)

UNIT III

Arrays: Introduction – One-Dimensional Arrays – Declaration of One-Dimensional Arrays – Initialization of One-Dimensional Arrays – Two-Dimensional Arrays - Initializing Two-Dimensional Arrays – Multi-Dimensional Arrays – Dynamic-arrays. **Character Arrays and Strings:** Introduction – Declaring and Initializing of String Variables – Reading Strings from Terminals – Writing Strings to Screen – String-Handling Functions.

(15 Hours)

UNIT IV

User-defined Functions : Introduction- Need for User-Defined Functions– A Multi- Function Program – Elements of User-Defined Functions – Definition of Functions– Return Values and their Types – Function Calls - Function Declaration - Category of Functions – No Arguments and No Return Values- Arguments but no Return Values- Arguments with Return Values- No Arguments but Return a Value – The Scope, Visibility and Lifetime of Variables. **Structures and Unions:** Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Arrays of Structures - Unions.   (15 Hours)

UNIT V

Pointers: Introduction – Understanding Pointers – Accessing the Address of a Variable – Declaring Pointer Variables – Initialization of Pointer Variables – Accessing a Variable through its Pointer – Pointer Expressions – Pointer Increments and Scale Factor. **File Management in C:** Introduction – Defining and Opening a File – Closing a File – Input / Output Operations on Files – Error Handling during I/O Operations – Command Line Arguments.

(15 Hours)

SELF-STUDY: (Not included for Examination)

Some Computational Problems (Page Nos.: 66,67)

Bit Level Programming (Page Nos.: 480-484)

TEXT BOOK

E. Balagurusamy. (2012). *Programming in ANSI C*, 6th Edition, McGraw Hill Education (India) Ltd.

UNIT	CHAPTERS	SECTIONS
I	1	1.8
	2	2.1-2.8, 2.10, 2.11
	3	3.1- 3.12, 3.14
	4	4.1- 4.5
II	5	5.1 - 5.9
	6	6.1- 6.5
III	7	7.1-7.8
	8	8.1- 8.4, 8.8
IV	9	9.1-9.13, 9.19
	10	10.1-10.5, 10.8, 10.12
V	11	11.1-11.6, 11.8, 11.9
	12	12.1-12.5, 12.7

REFERENCE BOOKS

1. E. Balagurusamy. (2013). *Computing fundamentals and C programming*, Tata McGraw Hill Publishing Company.

2. Byron Gottfried. (2005). *Theory and Problems of Programming with C,* Tata McGraw Hill Publishing Company.

Course Code 24UCSC21	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO 6	PSO 7
CO1	2	2	2	3	2	2	2	2	1	-
CO2	3	2	2	3	2	2	2	2	1	-
CO3	3	2	2	2	2	2	2	3	1	-
CO4	3	2	2	3	3	3	3	3	1	-
CO5	3	2	3	3	3	3	3	3	1	-

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi   Dr. K. Annbuselvi
Mrs. P. Aruna Devi   Mrs. V. Subhasini
Heads of the Departments   **Course Designers**

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VIRUDHUNAGAR
Quality Education with Wisdom and Values

B.Sc. COMPUTER SCIENCE
(for those who join in 2024 - 2025)

Semester II		Hours/Week: 5	
Core Course - 4 Practical - II	**PROGRAMMING USING C PRACTICAL**	Credits: 3	
Course Code **24UCSC21P**		Internal 40	External 60

COURSE OUTCOMES

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

  CO1:   write C programs using various operators and control structures. [K2]

  CO2:   identify input-process-output model of a program. [K2]

  CO3:   implement homogeneous and heterogeneous data structures using C [K3]

  CO4:   develop C programs using functions and pointers[K3]

  CO5:   design C program to give solution to real world problems. [K3]

Develop programs in C language for the following concepts:

1. Operators
2. Control structures
3. Arrays
4. String manipulation
5. Formatted input and output
6. Built-in functions
7. User defined functions
8. Structures
9. Unions
10. Pointers
11. Text files
12. Data files

Course Code 24UCSC21P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO 6	PSO 7
CO1	1	1	2	1	1	1	2	1	1	-
CO2	1	1	2	1	1	2	2	1	1	-
CO3	3	3	3	2	2	3	2	3	2	-
CO4	3	2	2	2	2	3	2	2	1	1
CO5	3	3	3	3	3	3	2	3	1	1

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi   Dr. K. Annbuselvi
Mrs. P. Aruna Devi   Mrs. V. Subhasini
Heads of the Departments   **Course Designers**

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B.Sc. Computer Science

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Semester II	**STATISTICAL METHODS AND ITS APPLICATIONS**	Hours/Week: 4	
Allied Course		Credits: 4	
Course Code **24UCSA21**		Internal 25	External 75

COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Define fundamental concepts of statistical data, data collection, methods of sampling, sample space and related events. [K1]

CO2: Understand the different Statistical measures of data to establish the relationship between the variables by using graphs and other correlation methods. [K2]

CO3: Compute the measures of central tendency, dispersion, skewness and kurtosis. [K2]

CO4: Perform correlation, regression analysis to show the association between variables and determine its statistical significance. [K3]

CO5: Apply appropriate statistical test to validate the hypothesis in real life situations. [K3]

UNIT I

Introduction to statistics – primary and secondary data – classification, tabulation and Diagrammatic Representation of statistical data – Bar-charts, Pie-diagrams' – Graphical Representation of data – Histograms, Frequency polygon, Ogives.   (12 hours)

UNIT II

Introduction- Measures of dispersion – characteristics – coefficient of dispersion - Coefficient of variation – Moments – skewness and kurtosis – Pearson's coefficient of skewness - Bowley's coefficient of Skewness – Coefficient of skewness based upon moments.   (12 hours)

UNIT III

Simple correlation – Karl Pearson's coefficient of correlation – correlation coefficient for A bivariate frequency distribution – Rank correlation – Regression – lines of regression – Properties of regression coefficient.   (12 hours)

UNIT IV

Events and sets – sample space – concept of probability – addition and multiplications Theorem on probability – conditional probability and independence of events – Baye's Theorem – concept of random variable – Mathematical Expectation.   (12 hours)

UNIT V

Concept of sampling distributions – standard error – Tests of significance based on t, Chi-square distribution, F-Test.   (12 hours)

TEXT BOOKS:

Gupta S.P, *Statistical Methods*, Sultan Chand and sons Publications,45th Edition, Reprint 2019.

REFERENCE BOOKS

1. Arumugam.S, Thangapandi Issac.A, *Statistics*, New Gamma Publication house, 2002.

2. Kishor.S. Trivedi, *Probability and statistics with reliability queuing and Computer Science Applications*, Prentice Hall of India (P) Ltd., New Delhi -1997.

3. Seymour Lipschutz, Marc Lars Lipson, *Discrete Mathematics*, Schaum's Outlines 3rd Edition., Tata McGraw Hill, Education Pvt. Ltd., New Delhi. 5th Reprint, 2012.

WEB RESOURCES

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

Course Code 24UCSA21	PO1	PO2	PO3	PO4	PO5	PO 6	PO7
CO1	3	2	1	3	1	1	-
CO2	3	2	1	3	2	1	-
CO3	3	1	1	3	2	1	-
CO4	3	1	1	3	2	1	-
CO5	2	2	1	2	2	1	-

Strong(3)   Medium(2)   Low(1)

 Dr.M.C. Maheswari   Dr.S.Kohila

Head of the Department   **Course Designer**

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Semester II		Hours/Week: 2	
Elective Course NME – 2	**INTRODUCTION TO HTML**	Credits: 2	
Course Code **24UCSN21**		Internal 25	External 75

Course Outcomes:

On completion of the course, students will be able to

CO1: understand the features of the web, web browsers and HTML tags. [K1]

CO2: describe the basic concepts of Internet, web programming and HTML program. [K1]

CO3: associate the various HTML tags like paragraphs, lists, frames, tables, forms, images and hyperlinks in the creation of webpages and formatting of images in HTML. [K2]

CO4: exemplify the use of various HTML tags in developing web pages for personal and business applications. [K2]

CO5: examine the different formatting options in text, tables, images, frames and forms to improve the web pages look and feel. [K3]

UNIT I

Introduction to Internet: Internet. **Internet Technologies:** Modem – Internet Addressing – Physical Connections – Telephone Lines. **Internet Browsers:** Internet Explorer: Window – File Menu – Edit Menu – View Menu – Favorites Menu – Tool bar. (6 Hours)

UNIT II

Introduction to HTML: HTML Documents – Anchor Tag – Hyper Links. **Designing the Body Section:** Heading Printing – Aligning the Headings – Horizontal Rule – Paragraph –Tab Settings: Formatting Characters – Physical Styles Format – Font Tag. (5 Hours)

UNIT III

Designing the Body Section: Images and Pictures: Low resolution Images – Adding Space Around the Image – Border for an Image. **Ordered and Unordered Lists:** Lists – Unordered Lists – Ordered Lists – Nested Lists. (6 Hours)

UNIT IV

Table Handling: Tables – Table creation in HTML – Width of the Table and Cells – Cell Spanning Multiple Rows/Columns – Coloring Cells – Column Specification – Some Sample Tables.

(6 Hours)

UNIT V

Frames: Frameset Definition – Frame Definition. **Forms**: Action Attribute – Method Attribute – Enctype Attribute – Drop Down List – Sample Forms. (7 Hours)

TEXT BOOK

Xavier C, (2015). *World Wide Web design with HTML*, McGraw-Hill Education (India) Private Limited.

UNIT	CHAPTER	SECTION
I	1	1.3
	2	2.1-2.4
	3	3.1.1-3.1.4, 3.1.7, 3.1.8
II	4	4.4-4.6
	6	6.1-6.4, 6.5.1-6.5.3
III	6	6.6
	7	7.1, 7.2, 7.4, 7.5
IV	8	8.1-8.7
V	10	10.1, 10.2
	12	12.1-12.5

REFERENCE BOOKS

1. *Mastering HTML5 and CSS3 Made Easy*, TeachUComp Inc., 2014.

2. Thomas Michaud (2014), *Foundations of Web Design: Introduction to HTML & CSS*, New Riders, a division of Pearson Education.

3. Rohit Khurana. (2010). *Computer Fundamentals and Internet Basics*, APH Publishing Corporation.

PO/CO Course Code 24UCSN21	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	1	-	-	2	-	-
CO2	1	1	1	-	2	1	-
CO3	2	2	2	2	3	1	-
CO4	2	2	-	-	-	-	-
CO5	2	2	2	1	3	1	-

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi   Dr. R. Barani

Mrs. P. Aruna Devi   Mrs. M. Sangeetha Alias Sheeba

Heads of the Departments   **Course Designers**

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B.Sc. COMPUTER SCIENCE
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Semester II		Hours/Week: 2	
SEC - 2	**DIGITAL PRINCIPLES**	Credits: 2	
Course Code **24UCSS21**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: outline basics of Number System, Digital Logic, Arithmetic & Data Processing Circuits, Registers and Counters. [K1]

CO2: infer fundamentals of Combinational Logic Circuits and Flipflops. [K1]

CO3: describe Code Conversion, Logic Gates, Multiplexer, Demultiplexer, Decoders, Encoders, Arithmetic Logic Unit, Types of Registers and Counters. [K2]

CO4: discuss Boolean Laws and Theorems, Karnaugh Map, Gated and Edge-triggered Flipflops. [K2]

CO5: implement Number System Code Conversions, Universal Logic Gates, Boolean Laws, Karnaugh Simplification, Data Processing Circuits, Arithmetic Circuits, types of Flipflops, Registers, Asynchronous and Synchronous Counters for the problem. [K3]

UNIT I

Number Systems and Codes: Binary Number System - Binary-to-Decimal Conversion - Decimal-to-Binary Conversion - Octal Numbers - Hexadecimal Numbers - The ASCII Code - The Excess 3 Code - The Gray Code. **Digital Logic:** The Basic Gates - NOT, OR, AND Gates - Universal Logic Gates - NOR, NAND.   (4 Hours)

UNIT II

Combinational Logic Circuits: Boolean Laws and Theorems - Sum-of-Products Method - Truth Table to Karnaugh Map - Pairs, Quads and Octets - Karnaugh Simplifications – Don't Care Conditions - Product-of-sums Method - Product-of-sums Simplifications.

(5 Hours)

UNIT III

Data Processing Circuits: Multiplexers – Demultiplexers - 1-of-16 Decoders - BCD-to-decimal Decoders – Encoders - Exclusive-OR gates. **Arithmetic Circuits:** Binary Addition - Binary Subtraction – 2's Complement Representation – 2's Complement Arithmetic - Arithmetic Building Blocks - The Adder - Subtractor - Arithmetic Logic Unit.   (7 Hours)

UNIT IV

Flip-Flops: RS Flip-Flops - Basic Idea - NOR-Gate Latch - Gated Flip-Flops - Edge-triggered RS Flip-Flops - Edge-triggered JK Flip-Flops - JK Master-Slave Flip-Flops.

(7 Hours)

UNIT V

Registers: Types of Registers - Serial In-Serial Out - Serial In-Parallel Out. **Counters:** Asynchronous Counters - Synchronous Counters - Mod-8 binary counter with parallel clock input - Synchronous 4-bit up-down counter.   (7 Hours)

SELF-STUDY: (Not included for examination)

Parallel In-Serial Out - Parallel In-Parallel Out (Page Nos. : 316 – 324)

TEXT BOOK

Albert Paul Malvino, Donald P. Leach & Goutam Saha (2011). *Digital Principles and Applications,* 7th Edition, Tata McGraw-Hill, New Delhi.

UNIT	CHAPTER	SECTIONS
I	5	5.1 - 5.8
	2	2.1 - 2.2
II	3	3.1 – 3.8
III	4	4.1 - 4.4, 4.6 - 4.7
	6	6.1 - 6.2, 6.5 - 6.8, 6.10
IV	8	8.1 - 8.3, 8.5, 8.8
V	9	9.1 - 9.3
	10	10.1, 10.3

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Course Code 24UCSS21	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2.a	PSO 2.b	PSO 3	PSO 4	PSO 5.a	PSO 5.b	PSO 6	PSO 7
CO1	3	-	1	-	-	-	2	2	-	-
CO2	3	-	2	-	-	-	3	3	-	-
CO3	3	-	3	3	2	-	3	3	2	2
CO4	3	-	3	3	-	2	3	3	2	-
CO5	3	-	3	2	2	3	3	3	2	-

Strong (3)   Medium (2)   Low (1)

Dr. K. Annbuselvi

Mrs. P. Aruna Devi   Ms. A. Dhivya

Heads of the Departments   Course Designer