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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM

REGULATIONS AND SYLLABUS

(with effect from Academic Year 2023 - 2024)

V.V.Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 13 UG Programmes(Aided), 14 UG Programmes(SF), 13 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

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, Computer Applications and Computer Applications - Graphic Design
Commerce & Management	:	Commerce, Commerce (Computer Applications), Commerce (Professional Accounting), Business Administration

PG PROGRAMMES

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Physics, Chemistry, Zoology, Biochemistry, Home Science - Nutrition and Dietetics, Computer 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. Discipline Specific Elective Courses (DSEC)
3. Elective Courses
4. Skill Enhancement Courses (SEC)
5. Non Major Elective Courses (NMEC)
6. Ability Enhancement Compulsory Courses (AECC)
7. Generic Elective Courses (GEC)
8. Self Study Courses
9. Extra Credit Courses (Self Study Courses) (Optional)

List of Non Major Elective Courses (NME)
(2023-2024 onwards)

UG PROGRAMMES

Name of the Course	Course Code	Semester	Department
Introduction to Tourism	23UHIN11	I	History(EM)
Indian Constitution	23UHIN21	II	History(EM)
சுற்றுலா ஓர் அறிமுகம்	23UHIN11	I	History (TM)
இந்திய அரசியலமைப்பு	23UHIN21	II	History(TM)
Popular Literature and Culture	23UENN11	I	English
English for Professions	23UENN21	II	
பேச்சுக்கலைத்திறன்	23UTAN11	I	Tamil
பயன்முறைத் தமிழ்	23UTAN21	II	
Practical Banking Basic Accounting Principles	23UCON11 23UCON22	I II	Commerce (Aided)
Financial Literacy-I Financial Literacy -II	23UCON12 23UCON21	I II	Commerce (SF)
Self-Employment and Startup Business Fundamentals of Marketing	23UCCN11 23UCCN21	I II	Commerce CA (SF)
Women Protection Laws	23UCPN11	I	Commerce (Professional Accounting)
Basic Labour Laws	23UCPN21	II	
Basics of Event Management	23UBAN11	I	Business Administration
Business Management	23UBAN21	II	

Quantitative Aptitude I	23UMTN11	I	Mathematics
Quantitative Aptitude II	23UMTN21	II	
Physics for Everyday life -I	23UPHN11	I	Physics
Physics for Everyday life -II	23UPHN21	II	
Food Chemistry	23UCHN11	I	Chemistry
Drugs and Natural Products	23UCHN21	II	
Ornamental fish farming and Management	23UZYN11	I	Zoology
Biocomposting for Entrepreneurship	23UZYN21	II	
Foundations of Baking and Confectionery	23UHSN11	I	Home Science – Nutrition and Dietetics
Basic Nutrition and Dietetics	23UHSN21	II	
Nutrition and Health	23UBCN11	I	Biochemistry
Life Style Diseases	23UBCN21	II	
Social and Preventive Medicine	23UMBN11	I	Microbiology
Nutrition & Health Hygiene	23UMBN21	II	
Herbal Medicine	23UBON11	I	Biotechnology
Organic farming and Health Management	23UBON21	II	
Basics of Fashion	23UCFN11	I	Costume Design And Fashion
Interior Designing	23UCFN21	II	
Office Automation	23UCSN11	I	Computer Science
Introduction to Internet and HTML 5	23UCSN21	II	
Office Automation	23UITN11	I	Information Technology
Introduction to HTML	23UITN21	II	
Introduction to HTML	23UCAN11	I	Computer Applications
Fundamentals of Computers	23UCAN21	II	
Introduction to HTML	23UGDN11	I	Computer Applications - Graphic Design
Fundamentals of Computers	23UGDN21	II	
Organic Farming	23UBYN11	I	Botany
Nursery and Landscaping	23UBYN12		
Mushroom Cultivation	23UBYN21	II	
Medicinal Botany	23UBYN22		
Cadet Corps for Career Development I	23UNCN11	I	National Cadet Corps
Cadet Corps for Career Development II	23UNCN21	II	

List of Ability Enhancement Compulsory Courses (AECC) & Generic Elective Courses (GEC) Offered

ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)

1. Value Education
2. Environmental Studies

GENERIC ELECTIVE COURSES 1

1. Human Rights
2. Women Studies

GENERIC ELECTIVE COURSES 2

1. Constitution of India
2. Modern Economics
3. Adolescent Psychology
4. Disaster Management

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 fulfill 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 Information Technology

To Promote Academic Excellence and create groomed, technically competent and skilled intellectual IT Professionals

Mission of the Department of Information Technology

- To uplift rural students through advanced quality education in Information Technology.

- To enhance Employability opportunity due to knowledge
- To provide Moral values to turn out to be a responsible citizen
- To develop graduates to meet the challenges of the rapidly changing world.

Programme Educational Objectives (PEOs) of B.Sc. Information Technology Programme
The students will be able

PEO1	to be prepared to gain employment as an IT Professional
PEO2	to function effectively as individuals in the workplace, growing into highly technical or project management and leadership roles.
PEO3	to develop graduates to meet the challenges of the rapidly changing world.

Key Components of the Mission Statement	**P**rogramme **E**ducational **O**bjectives (**PEO**s)		
	PEO1	PEO2	PEO3
Uplift Rural Students	✓		✓
Enhance employability opportunity	✓	✓	✓
provide moral values to turn out to be a responsible citizen		✓	
develop graduates to meet the challenges of the rapidly changing world		✓	✓

B.1.2 Programme Outcomes (POs)

POs shall be based on Graduate Attributes (GAs) of the Programme. The GAs are the 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 the B.Sc. Information Technology programme, the students will be able to

PO1 - *Disciplinary Knowledge*

PSO 1.a. apply the principles and working of the hardware and software aspects of computer systems incorporated with the knowledge of related courses to pursue higher studies.

PSO 1.b. identify and solve Technical problems by applying mathematical foundations and algorithmic principles in IT environment to meet industrial challenges and get better placement.

PO2 - *Communication Skills*

PSO 2. a. design and implement a secure and reliable information communication system by using concepts of computer networks, network security and information theory.

PSO 2. b. develop technical project reports and present them orally among the users.

PO3 - *Scientific Reasoning and Problem Solving*

PSO 3. characterize, illustrate and analyze a computer system, component, or algorithm to meet desired needs and to solve computational problems in real world based on their research career pursuits.

PO4 - ***Critical Thinking and Analytical Reasoning***

PSO 4. critically analyze the techniques in IT to provide technology based onclusions to transform innovative ideas into reality.

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

PSO 5.a: use and apply current technical concepts and practices in the core Information Technologies of human computer interaction, programming and networking for higher studies, research activities and to become successful career, entrepreneurship..

PSO 5.b: be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas by self-directed and lifelong learning.

PO6 - Cooperation/Team Work and Multi-Cultural Competence

PSO 6: work effectively as a member or leader of a team to achieve project target.

PO7 - Moral and Ethical awareness

PSO 7: demonstrate a sense of societal and ethical responsibility in their professional endeavours.

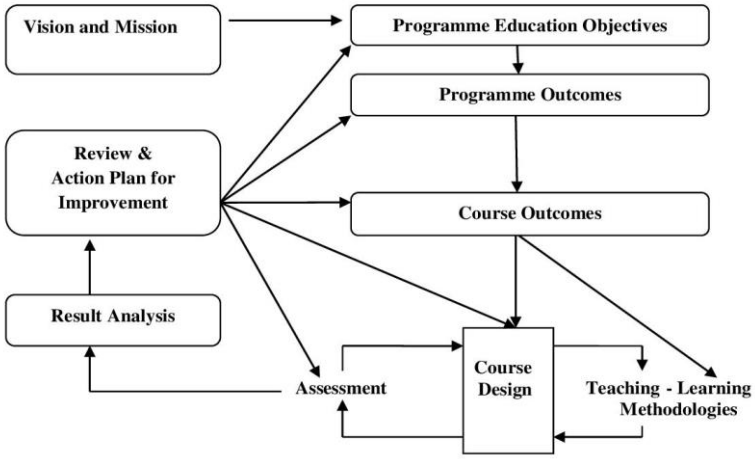
PO-PEO Mapping Matrix

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	-	-	✓

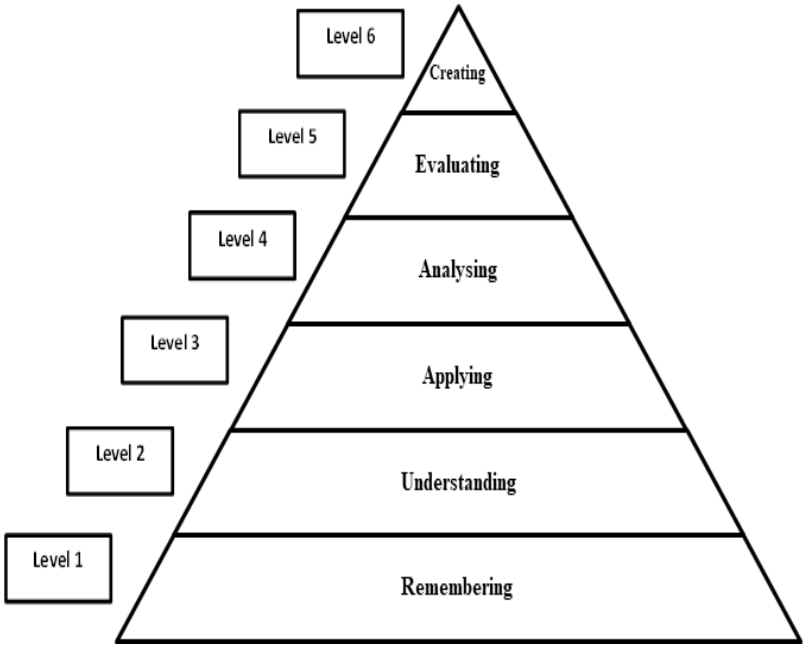
B.1.4 Course Outcomes (COs)

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

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 course of study for a period of three academic years (six semesters).

MEDIUM OF INSTRUCTION

English

COURSES OFFERED

Part I	:	Tamil/Hindi/Alternate Course
Part II	:	English
Part III	:	Core Courses
	:	Discipline Specific Elective Courses
	:	Elective Courses
	:	Self-Study Course
Part IV	:	Skill Enhancement Courses (SEC)
	:	Field Project/Internship
	:	Non-Major Elective Courses (NMEC)
	:	Ability Enhancement Compulsory Courses (AECC)
	:	Generic Elective Courses (GEC)
	:	Self-Study Course
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 and National Cadet Corps/ Rotaract Club

B.2 EVALUATION SCHEME

B.2.1.PART II

Components	Internal Assessment Marks	Summative Examination Marks	Total Marks
Theory	15	75	100
Practical	5+5	-	

INTERNAL ASSESSMENT
Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	15
Practical	:	5+5
Total	**:**	**25**

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

B.2.2.Part I & PART III - Core Courses, Discipline Specific Elective Courses & Elective Courses

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

INTERNAL ASSESSMENT
Distribution of Marks
Theory

Mode of Evaluation			Marks
Internal 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

Practical

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

Internal Test- Average of the best 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 Internal 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**

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

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			**Marks**
Internal Test		:	15
Assignment	K2 Level	:	5
Quiz	K2 Level	:	5
	Total	**:**	**40**

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 Internal 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**

Summative Examination

Mode of Evaluation		Marks
Summative Examination	:	50
Multiple Choice Questions (K2 Level)	:	25
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**

.2.6 Part V – Extension Activities

Assessment by Internal examiner 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.2.7 EXTRA CREDIT COURSES (OPTIONAL)

*For theory course, the mode of evaluation is only internal for a maximum of 100 Marks.

Question Pattern **Duration: 3 Hours**

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 10)	Multiple Choice	10	10	1	10
B Q. No.(11 -15)	Internal Choice – Either or Type	5	5	9	45
C Q. No.(16-20)	Open Choice	5	3	15	45
				Total	**100**

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 Theory Assessment.
- Pass minimum for External Examination is 27 marks out of 75 for Core Courses, Discipline Specific Elective Courses and Allied Courses.
- Pass minimum for External Examination is 21 marks out of 60 for Skill Enhancement Courses and Non Major Elective Courses.
- 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 Course and Generic Elective Course is 40.
- Pass minimum for Self Study Courses is 40.

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.

- These rules are applicable to UG, PG and M.Phil. Programmes and come into effect from 2020-2021 onwards.
- For Certificate, Diploma, Advanced Diploma and Post Graduate Diploma Programmes,the students require 75% of attendance to appear for the Theory/Practical Examinations.

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 - 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 students and it gives the opinion of the students on attainment of Programme Outcomes
	Co-curricular / Extracurricular activities 15%	For participation in Co-curricular / Extracurricular activities during the period of their study.

Programme Articulation Matrix (PAM)

Course Code	**Course Title**	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO7**	**PO8**
Average Direct PO Attainment									
Direct PO Attainment in percentage									

Indirect Attainment of POs for all Courses

POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO7**	**PO8**
Graduate Exit Survey								
Indirect PO Attainment								

Attainments of POs for all Courses

POs	**PO1**	**PO2**	**PO3**	**PO 4**	**PO5**	**PO6**	**PO 7**	**PO 8**
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 Extracurricular 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 PROGRAMME EDUCATIONAL OBJECTIVES

The college has always been involving the key stake holders 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. Information Technology .Programme.

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

BACHELOR OF SCIENCE
INFORMATION TECHNOLOGY (2025)

Outcome Based Education with Choice Based Credit System
Programme Structure - Allotment of Hours and Credits
For those who join in the Academic Year 2023-2024

Components	Semester						Total Number of Hours / Credits
	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, Allied and DSEC Courses:							
Core Course	5(5)	5(5)	5(5)	5(5)	4 (4)	5(5)	29 (29)
Core Course	-	-	-	-	4 (4)	5(4)	9 (8)
Core Course	-	-	-	-	4 (4)	4(4)	8 (8)
Core Course Practical	5 (3)	5 (3)	5(3)	4(3)	5 (3)	5 (3)	29 (18)
Core Course Project	-	-	-	-	1 (1)	-	1 (1)
DSEC	-	-	-	-	4 (3)	5 (3)	9 (6)
DSEC Practical	-	-	-	-	4 (2)	4 (2)	8 (4)
Elective Course	4 (4)	4 (4)	4 (4)	4 (4)	-		16 (16)
Self Study Course	-	-		-	-	0 (1)	0 (1)
Part IV : Skill Enhancement Courses, Non Major Elective Courses, Ability Enhancement Compulsory Courses, Generic Elective Courses, & Self Study Course							
SEC	2(2)	-	1 (1)	-	-	-	3 (3)
SEC	-	2 (2)	2 (2)	2 (2)	2 (2)	2 (2)	10(10)
Non Major Elective	2(2)	2(2)	-	-	-	-	4 (4)
AECC 1 (Value Education)	-	-	-	-	2 (2)	-	2 (2)
AECC 2 (Environmental Studies)	-	-	-	2 (2)	-	-	2 (2)
GEC 1	-	-	1 (1)	-	-	-	1 (1)
GEC 2	-	-	-	1 (1)	-	-	1 (1)
Self Study Course	-	-	-	-	0 (1)		0 (1)
Part V – Extension Activities	-	-	-	0 (1)	-	-	0 (1)
Total	**30 (22)**	**30 (22)**	**30 (22)**	**30 (24)**	**30 (26)**	**30 (24)**	**180 (140)**
Extra Credit Course (Self Study Course)					0 (2)	-	0 (2)

DSEC: Discipline Specific Elective Course SEC: Skill Enhancement Course

AECC: Ability Enhancement Compulsory Course GEC: Generic Elective Course

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY – 2025

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	23UTAG11/ 23UHDG11	6	3	3	25	75	100
2.	**Part II**		English	23UENG11	6	3	3	25	75	100
3.	**Part III**	Core Course -1	Programming in C	23UITC11	5	5	3	25	75	100
4.		Core Course -2 Practical I	C Programming Practical	23UITC11P	5	3	3	40	60	100
5.		Elective Course	Discrete Mathematics-I	23UITA11	4	4	3	25	75	100
6.	**Part IV**	NME-1	Office Automation	23UITN11	2	2	3	25	75	100
7		SEC- 1 Foundation Course	Fundamentals of Computers	23UITF11	2	2	3	25	75	100
				Total	**30**	**22**				**700**

B.SC. INFORMATION TECHNOLOGY

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	23UTAG21 / 23UHDG21	6	3	3	25	75	100
2.	**Part II**		English	23UENG21	6	3	3	25	75	100
3.	**Part III**	Core Course –3	Data Structures	23UITC21	5	5	3	25	75	100
4.		Core Course –4 Practical II	Data Structures using C++ Practical	23UITC21P	5	3	3	40	60	100
5.		Elective Course	Digital Principles and Applications	23UITA21	4	4	3	25	75	100
6.	**Part IV**	NME-2	Introduction to HTML	23UITN21	2	2	3	25	75	100
7		SEC-2	Hardware Simulator Practical	23UITS21P	2	2	3	40	60	100
				Total	**30**	**22**				**700**

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY

(2023-2024 onwards)

Semester I	**PROGRAMMING IN C**	Hours/Week: 5	
Core Course - 1		Credits: 5	
Course Code **23UITC11**		Internal 25	External 75

COURSE OUTCOMES:

On completion of the course the students will be able to

CO1: outline the basics of programming concepts and user defined functions to enhance the students learning. [K1]

CO2: characterize the usage of basic programming construct, user defined data types, Array concepts and functions which help them to develop an application. [K2]

CO3: extend the concepts of C Programming that includes arrays, built-in and user defined functions to solve real world problems in easier manner. [K2]

CO4: expose the concept of Information Technology which requires the knowledge of programming environment with variables, data types, numerous statements and functions, Input/output Operations, Arrays to improve their programming skills. [K3]

CO5: implement all fundamental programming statements, functions and Arrays to develop their real time projects in the field of Information Technology. [K3]

UNIT I

Overview of C: History of C – Importance of C – Basic structure of C – Programming style – Executing a 'C' Program. **Constants, Variables and Data types:** Character Set – C Tokens – Keywords and Identifiers – Constants – Variables – Data Types - Declaration of Variables, Declaration of Storage Class – Assigning Values to Variables – Defining Symbolic Constants – Declaring a Variable as Constant – Declaring a Variable as Volatile – Overflow and Underflow of Data. (15 Hours)

UNIT II

Operators and Expressions: Arithmetic Operators - Relational Operators - Logical Operators – Assignment Operators - Increment and Decrement Operators – Conditional Operators - Bitwise Operators - Special Operators – Arithmetic Expression – Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expression – Operator Precedence and Associativity – Mathematical functions.

Managing Input and Output Operations: Reading a Character – Writing a Character- Formatted Input- Formatted Output. (10 Hours)

UNIT III

Decision Making and Branching: Simple If statement – The If.…Else Statement Nesting of If ….Else Statement – The Else if Ladder – The Switch Statement – The ?: Operator –The GOTO Statement.

Decision Making and Looping: The while Statement – The do Statement – The for Statement. (20 Hours)

UNIT IV

Arrays: One-Dimensional Arrays – Declaration of One-Dimensional Arrays - Initialization of One-Dimensional Arrays – Two-Dimensional Arrays – Initialization of Two Dimensional Arrays – Multi Dimensional Arrays.

Character Arrays and Strings: Declaring and Initializing String Variables – Reading Strings from Terminal – Writing String to Screen – Arithmetic Operations on Characters – Putting Strings Together –Comparison of two Strings- String Handling Function. (15 Hours)

UNIT V

User Defined functions: 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 Returns a Value - Nesting of Functions Recursion.

Structures and Unions: Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions - Unions – Size of Structures.

(15 Hours)

TEXT BOOKS

Balagurusamy.E (2022), *Programming in ANSI C*, Edition 8, Tata McGraw-Hill Publishing Company.

UNIT	CHAPTER	PAGE.NO
I	2, 3	17 – 31, 39 - 60
II	4, 5	68 – 89, 100 - 119
III	6 , 7	131 – 155, 171 - 192
IV	8, 9	212 – 236. 257 - 278
V	10, 11	291 – 315, 347 - 366

REFERENCE BOOKS

1. Byron S., Gottfried. (2006), *Programming with C*, Second Edition, McGraw Hill.
2. Rajaraman.V, (2018), *Introduction to Information Technology*, Third Edition, PHI Learning Ltd.,
3. Reema Thareja (2015), *Introduction to C Programming*, Second Edition, Oxford University Press.

WEB RESOURCES

http://www.tutorialspoint.com/cprogramming/

Course Code 20UITC11	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	-	3	1	2	3	2	3	-
CO2	3	2	1	2	2	1	3	2	2	-
CO3	3	2	2	1	2	1	2	2	-	-
CO4	3	3	3	3	3	2	2	3	3	-
CO5	2	3	2	2	3	2	2	3	3	-

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

Dr.(Mrs).A.Bharathi Lakshmi — Head of the Department

Mrs.G.Chandraprabha — Course Designer

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester I	**C PROGRAMMING PRACTICAL**	Hours/Week: 5	
Core Course – 2 Practical I		Credits: 3	
Course Code **23UITC11P**		Internal 40	External 60

COURSE OUTCOMES:

On completion of the course the students will be able to

CO1: demonstrate the understanding of syntax and semantics of C programs. [K2]

CO2: outline the problem and solve using C programming techniques. [K2]

CO3: develop suitable programming constructs for problem solving. [K3]

CO4: construct various concepts of C language to solve the problem in an efficient way. [K3]

CO5: develop the C program for a given problem and debugging for its correctness. [K3]

EXERCISES:

1. Programs using Input/ Output functions
2. Programs on conditional structures
3. Command Line Arguments
4. Programs using Arrays
5. String Manipulations
6. Programs using Functions
7. Recursive Functions
8. Programs using Pointers
9. Files
10. Programs using Structures & Unions

Course Code 23UITC11P	PO1		PO2		PO3	PO4	PO5		PO6	PO7
	PSO 1. a.	PSO 1. b.	PSO 2. a.	PSO 2. b.	PSO3	PSO 4	PSO 5.a.	PSO 5. b.	PSO 6	PSO 7
CO1	1	1	3	3	3	3	3	2	2	-
CO2	3	3	3	3	3	3	2	3	2	-
CO3	2	2	3	3	3	2	2	2	1	-
CO4	2	2	3	3	2	3	2	2	2	-
CO5	1	1	3	3	2	3	1	2	2	-

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

Dr.A.Bharathi Lakshmi
Heads of the Departments

Mrs.D.ShunmugaKumari
Course Designers

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester I	**DISCRETE MATHEMATICS-I**	Hours/Week: 4	
Elective Course		Credits: 4	
Course Code 23UITA11		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 order - Exclude Lattices and Topological sorting) (12 Hours)

UNIT III

Counting: The basic of counting - The pigeonhole principle(Exclude Generalized Pigeonhole 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 Relations 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(Thorems 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, Discrete Mathematics and its applications, Seventh Edition, McGrawHill Publishing Company, 2012 .
2. M.Venkataraman, N.Sridharan and N.Chandrasekaran, ,Discrete Mathematics, The National Publishing Company, 2009

Unit	Chapter	Section
Text Book 1		
I	1	1.1,1.2,1.3,1.4
II	9	9.1, 9.3, 9.6
III	6	6.1, 6.2, 6.3
	8	8.1, 8.2
IV	10	10.1, 10.2, 10.3, 10.4, 10.6
Text Book 2		
V	6	6.1, 6.2, 6.3, 6.4, 6.5, 6.7

REFERENCE BOOKS

1. S.Arumugam and A. ThangapandiIsaac,Modern Algebra , Scitech publications 2005.
2. S.Arumugam and S.Ramachandran, Invitation to Graph Theory, Scitech Publications,2005, Chennai.
3. Tremblay and Manohar,Discrete Mathematical Structures with applications to Computer Science -, McGraw Hill,1997.

WEB RESOURCES

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

Course Code 23UITA11	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**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	1
CO5	3	3	3	3	3	3	1

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

Dr.A.Bharathi Lakshmi — Heads of the Departments

Mrs.T.Anitha — Course Designers

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester I	**OFFICE AUTOMATION**	Hours/Week: 2	
NME-1		Credits: 2	
Course Code **23UITN11**		Internal 25	External 75

COURSE OUTCOMES:

On completion of the course the students will be able to

CO1: outline the basic concepts of memory , components of computer systems and word processing software. [K1]

CO2: recognize the features of operating systems, spreadsheet and Microsoft Office Word 2010. [K1]

CO3: describe the concepts of document formatting, inserting tables and functions in spreadsheets. [K2]

CO4: discuss the evolution of programming languages, types of memory and document editing. [K2]

CO5: use the elements of Microsoft Office Word 2010 and Microsoft Office Excel 2010 to create a useful application. [K3]

UNIT 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. (6 Hours)

UNIT II

Introducing Microsoft Word 2010: Starting Microsoft Word 2010 – Exploring the User Interface of MS Word 2010 – Exploring Tabs in Ribbon: Home Tab, Insert Tab, Page Layout Tab – Saving the Document – Creating a New Document: Creating a Blank Document – Opening an Existing Document – Closing the Document – Quitting from Microsoft Word 2010.

Working with First Document in MS Word 2010: Working with Text: Adding Text in a Document, Editing Text, Creating Bulleted and Numbered Lists – Applying Text Formatting: Changing Font and Font Size of Text, Applying Bold, Italic, and Underline, Changing the Color of the Text – Inserting Header and Footer. (6 Hours)

UNIT III

Working with Pictures and Tables: Working with Graphical Object: Inserting a Picture, Inserting Clip Art, Inserting a Shape, Inserting a WordArt – Performing Advance Operation on Graphical Object: Cropping a Picture, Adding a Border to a Picture – Working with Table: Inserting a Table, Adding Rows and Columns in an Existing Table, Merging and Splitting Cells.

Using Mail Merge, Envelops, and Labels: Creating a Using Mail Merge: Setting the Environment for Mail Merge, Adding and Editing Recipients, Inserting Merge Fields, Previewing and Finishing Mail Merge. (6 Hours)

UNIT IV

Introduction to Excel 2010: Understanding Workbooks and Worksheets – Starting Microsoft Excel 2010 – Exploring the Microsoft Excel 2010 User Interface: The File Tab, Quick Access Toolbar, The Title Bar, The Minimize, Maximize/Restore, and Close Buttons, The Ribbon, The Formula Bar, The Name box, The Worksheet, Scroll Bars, The Sheet Tab, The Status Bar.

Working with Worksheets and Cells: Exploring the Different Types of Data used in Excel: Entering Data in a Worksheet – Saving a Workbook – Opening an Existing Workbook – Working with Rows and Columns: Inserting Rows and Columns, Deleting Rows and Columns – Describing the Cut, Copy, and Paste Commands: Using the Cut Command, Using the Copy Command, Using the Paste Command. (6 Hours)

UNIT V

Working with Charts, Smart Art Graphics, and Sparklines: Understanding Charts: Understanding Chart Type: Column Chart, Bar Chart, Line Chart and Pie Chart, Working with Charts: Creating a Chart.

Working with Formulas and Functions: Exploring the Basic Concepts used in Formulas: Understanding Operators in Formulas, Understanding Cell Referencing – Working with Mathematical and Statistical Functions: Using the PRODUCT Function, Using the SUM Function, Using the AVERAGE Function – Working with Logical Functions: Using the AND Function, Using the IF Function, Using the OR Function. (6 Hours)

TEXT BOOK

Vikas Gupta (2018),*Comdex Computer Course Kit Windows 7 with Office 2010*, Dreamtech Press, New Delhi, India.

UNIT	PAGES
I	Material Will be Provided
II	173-175, 177-180, 184, 185, 187-190, 195-205, 207, 217-220
III	238-241, 243-245, 250-255, 262-270
IV	277-283, 302-309, 313-319
V	366-368, 371, 372, 388-398, 403-407

REFERENCE BOOK

1. Dinesh Maidasani (2011), *Learning Computer Fundamentals, MS Office and Internet & Web Technology*, Third Edition, Firewall Media, Kerala, India.
2. Ramesh Bangia (2015), *Learning Microsoft Office 2010*, UBS Publishers, Bengaluru, India.

WEB RESOURCES

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

PO/CO Course Code 23UITN11	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.A.Bharathi Lakshmi
Heads of the Departments

Mrs.G.Chandraprabha
Course Designers

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester I	**FUNDAMENTALS OF COMPUTERS**	Hours/Week: 2	
SEC-1 Foundation Course		Credits: 2	
Course Code: **23UITF11**		Internal 25	External 75

COURSE OUTCOMES:

On completion of the course the students will be able to

CO1: outline the Computer fundamentals and various problem solving concepts in Computers. [K1]

CO2: describe the basic computer organization, software, computer languages, software development life cycle and the need of structured programming in solving a computer problem. [K1]

CO3: extend the types of computer languages, software, computer problems and examine how to set up expressions and equations to solve the problem. [K2]

CO4: demonstrate the most appropriate programming languages, constructs and features to solve the problems in diversified domains. [K2]

CO5: experiment the design of modules and functions in structuring the solution and various Organizing tools in problem solving. [K2]

UNIT I

Introduction: Characteristics of Computers - Evolution of Computers **Basic Computer Organization:** I/O Unit - Storage Unit - Arithmetic Logic Unit - Control Unit - Central Processing Unit. (6 Hours)

UNIT II

Computer Software: Types of Software - System Architecture **Computer Languages:** Machine Language - Assembly Language - High Level Language - Object Oriented Languages. (6 Hours)

UNIT III

Problem Solving Concepts: Problem Solving in Everyday life - Types of Problems - Problem solving with computers - Difficulties with Problem Solving. (6 Hours)

UNIT IV

Problem solving concepts for the computer: Constant Variables - Data Types - Functions -Operators - Expressions and Equations - **Organizing the Solution:** Analyzing the problem - Algorithm - Flowchart - Pseudo code.

Self-Study: Data Types (6 Hours)

UNIT V

Programming Structure: Structuring a solution - Modules and their function - Local and Global variables - Parameters - Return values - Sequential Logic Structure - Problem solving with Decision - Problem Solving with Loops. (6 Hours)

TEXT BOOKS

1. PradeepK.Sinha and PritiSinha, (2004) ―Computer Fundamentals‖, Sixth Edition, BPB Publications. (Unit I : Chapter 1 & 2, Unit II : Chapter 10 & 12)
2. Maureen Sprankle and Jim Hubbard, (2009) ―Problem Solving and Programming Concept, Ninth Edition, Prentice Hall. (Unit III: Chapter 1,2) Unit IV : Chapter 3, Unit V : Chapter 4,5, 6,7)

REFERENCE BOOKS

1. R.G. Dromey, (2007), ―How to Solve it by Computer‖, Prentice Hall International Series in Computer Science.
2. C. S. V. Murthy, (2009), ―Fundamentals of Computers‖, Third Edition, Himalaya Publishing House.

WEB RESOURCES:

http://www.comptechdoc.org/basic/basictut/

http://www.tutorialspoint.com/computer_fundamentals/

Course Code 23UITF11	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
CO 1	3	2	2	1	2	1	2	2	1	1
CO 2	3	3	2	3	3	2	3	2	1	1
CO 3	3	3	2	2	3	3	3	2	1	1
CO 4	3	3	2	2	3	3	3	2	1	1
CO 5	3	3	3	2	3	3	3	2	1	1

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

Dr.Mrs.A.Bharathi Lakshmi
Heads of the Departments

Mrs.S.Rajapriya
Course Designer

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester II	**DATA STRUCTURES**	Hours/Week: 5	
Core Course -3		Credits: 5	
Course Code 23UITC21		Internal 25	External 75

COURSE OUTCOMES:

On completion of the course the students will be able to

CO1 : understand basic data structures, their implementation and some of their standard applications. [K1]

CO2 : describe the ability to design and analyze basic algorithms and prove their correctness using the appropriate data structure. [K2]

CO3 : illustrate the usage of data structures in building an intelligent system by using information theory calculations. [K2]

CO4 : implement the Arrays, Linked List, Stack, Queues, Searching and Sorting to develop the applications for better utilization of system resources. [K3]

CO5 : construct appropriate data structure and algorithm design method for a specified application. [K3]

UNIT I

Introduction and Overview: Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures.

Arrays: Definition- Terminology – One-Dimensional Array- Multi Dimensional Arrays – Pointer Array. (14 Hours)

UNIT II

Linked Lists: Definition – Single Linked List – Circular Linked List- Double Linked Lists –Memory Representation. (15 Hours)

UNIT III

Stacks: Introduction – Definition – Representation of a Stack – Operations on Stack.

Queues: Introduction – Definition – Representation of Queues **–** Various Queue Structures – Circular Queue –Deque. (14 Hours)

UNIT IV

Sorting: Basic Terminologies – Sorting Techniques – Sorting by insertion – Straight insertion Sort – Sorting by Selection – Straight Selection Sort - Sorting by Exchange: Bubble Sort –Quick Sort – Sorting by Merging: Simple Merging – Binary Merge – Merge Sort.

(18 Hours)

UNIT V

Searching: Linear Search Techniques: Basic Terminologies – Linear Search with Arrays – Linear Search with Linked List – Linear Search with Ordered List – Binary Search.

(14 Hours)

TEXT BOOKS

Debasis Samantha (2009), *Classic Data Structures*, Second Edition, PHI Learning Private Limited.

UNIT	CHAPTERS	SECTIONS
I	1,2	1.1-1.4, 2.1-2.5
II	3	3.1-3.4, 3.7
III	4, 5	4.1 – 4.4 5.1 - 5.4 (5.4.1,5.4.2)
IV	10	10.1, 10.2, 10.3 (10.3.1 Pages 534 – 536), 10.4(10.4.1 Pages 554 – 557),10.5 (10.5.1, 10.5.4), 10.7 (10.7.1 – 10.7.3)
V	11	11.1, 11.2 (11.2.1 – 11.2.4)

REFERENCE BOOKS

1. Sartajsahni (2000), *Data structures and applications in C++*, McGraw Hill.
2. Chitra, Rajan (2005), *Data Structures*, First edition, Vijay Nicole publishers.
3. James A.Storer (2002), *An Introduction to Data Structures and Algorithms*, Springer Science + Business Media, LLC.

WEB RESOURCES:

http://www.cs.sunysb.edu/~skiena/214/lectures/

http://datastructures.itgo.com/graphs/dfsbfs.htm

Course Code 23UITC21	**PO 1**		**PO 2**		**PO 3**	**PO4**	**PO5**		**PO 6**	**PO 7**
	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	2	3	2	1	3	2	2	-
CO2	3	3	1	3	2	2	2	3	2	-
CO3	3	3	3	2	3	3	3	2	3	-
CO4	3	3	1	2	3	2	3	2	2	-
CO5	3	3	3	3	3	2	2	3	3	-

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

Dr.(Mrs).A.Bharathi Lakshmi
Head of the Department

Dr.(Mrs).A.Bharathi Lakshmi
Course Designer

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester II	**DATA STRUCTURES USING C++ PRACTICAL**	Hours/Week: 5	
Core Course – 4 Practical II		Credits: 3	
Course Code **23UITC21P**		Internal 40	External 60

COURSE OUTCOMES:

On completion of the course the students will be able to

CO1 : Illustrate the concepts of data structure, data type and array data structure to enhance their learning. [K2]

CO2 : Describe the algorithms and their time complexity for better utilization of system resources. [K2]

CO3 : practice and implement various data structure concepts such as Stacks, Queues, linked List, Trees to solve various computing problems. [K3]

CO4 : solve and execute programs using data structure concepts. [K3]

CO5 : prepare data structure algorithms to solve various problems in IT effectively and professionally. [K3]

EXERCISES:

1. Perform Stack Operations using Array.
2. Perform Queue Operations using Array.
3. Perform Stack Operations using Pointers.
4. Perform Queue Operations using Pointers.
5. Implementation of Singly Linked List operations using Pointers.
6. Implementation of Search Key in Singly Linked List.
7. Implementation of Circular Linked List operations using Pointers.
8. Implementation of Doubly Linked List operations using Pointers.
9. Implementation of Bubble sort using functions.
10. Implementation of insertion sort using functions.
11. Implementation of selection sort using functions.

12. Implementation of Merge sort using arrays.
13. Implementation of Bubble sort using arrays.
14. Implementation of Quick sort using arrays.

Course Code 23UITC21P	**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	2	3	3	3	3	3	2	1	-
CO2	3	1	3	3	3	3	2	3	2	-
CO3	2	3	3	3	3	2	2	3	1	-
CO4	3	2	3	3	2	3	2	2	2	-
CO5	2	1	3	3	2	3	1	2	1	-

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

Dr.(Mrs).A.Bharathi Lakshmi
Head of the Department

Dr.J.Kalavathi
Course Designer

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester II	**DIGITAL PRINCIPLES AND APPLICATIONS**	Hours/Week: 4	
Elective Course		Credits: 4	
Course Code **23UITA21**		Internal 25	External 75

COURSE OUTCOMES:

On completion of the course the students will be able to

CO 1 **:** recognize number system over Boolean data and outline the arithmetic and combinational circuits using counters and registers in digital logic system. [K1]

CO 2 **:** classify various structure of number systems, counters and registers articulating in logic gates, digital circuit designing representations. [K2]

CO 3 **:** illustrate the concept of coding system, minimization techniques, Flip flops, registers, counters, gates and how to prevent various hazards and timing problems in a digital design. [K2]

CO 4 **:** implement Boolean Algebra, Logic gates, combinational and sequential circuits, counters and registers to design the circuits effectively. [K3]

CO 5 **:** apply the concepts of Number systems, Boolean algebra, minimization techniques, Logic gates, Flip flops, Registers and Counters to discover solutions for specific real time problems in the field of Information Technology. [K3]

UNIT I

Number Systems and Codes: Introduction - Number system - Floating Point Representation of Numbers - Arithmetic Operation - 1's and 2's Complements - 9's Complement - 10's Complement-Binary Coded Decimal(BCD) - Codes. (15 Hours)

UNIT II

Boolean Algebra and Minimization Techniques: Introduction - Development of Boolean Algebra - Boolean Logic Operations - Basic Laws of Boolean Algebra - Demorgan's Theorems - Sum of Products and Product of Sums - Karnaugh Map. (15 Hours)

UNIT III

Logic Gates: Introduction - Positive and Negative Logic Designation - Logic Gates.

Arithmetic Circuits: Introduction - Procedure for the Design of Combinational Circuits - Half-Adder - Full-Adder - K-Map Simplification - Half- Subtractor- Full-Subtractor.

(10 Hours)

UNIT IV

Combinational Circuits: Introduction - Multiplexers (Data Selectors) – Basic Four-input Multiplexer – IC74151-8 to 1 multiplexer – IC74150-16 to 1 Multiplexer - De-multiplexers (Data Distributors) – 1-to-4 DE multiplexer – 1-to-8 DE multiplexer - Decoders – Basic Binary decoder – 3-to-8 Decoder - Encoders – Octal to Binary Encoder – Decimal – BCD Encoder - Parity Generators/Checkers.

Flip-Flops: Introduction – Latches - Flip-Flops - S-R Flip-Flop - D Flip-Flop - J-K Flip-Flop -T Flip-Flop. (10 Hours)

UNIT V

Counters: Introduction - Asynchronous (Ripple or Serial) Counter - Ripple Counter with Decoded Outputs - Asynchronous Down Counter - Up-Down Counter.

Registers: Introduction - Shift Registers – Serial-in-Serial-out Shift Register - Serial-in-Parallel-out Shift Register - Parallel-in-Serial-out Shift Register - Parallel-in-Parallel-out Shift Register. (10 Hours)

TEXT BOOK

S.Salivahanan&S.Arivazhagan (2009), *Digital Circuits and Design*, Third Edition, Vikas Publishing House Pvt. Ltd.

UNIT	CHAPTER	SECTIONS
I	1	1.1 - 1.9
II	2	2.1 - 2.7
III	3, 5	3.1 - 3.3, 5.1 - 5.7
IV	6, 7	6.1, 6.2, 6.4(6.4.1,6.4.2), 6.5(6.5.1, 6.5.2), 6.7(6.7.1, 6.7.2), 7.1 - 7.7
V	8,9	8.1-8.3, 8.6, 8.7, 9.1, 9.2(9.2.1, 9.2.3, 9.2.5, 9.2.7)

REFERENCE BOOKS

1. Tocci R.J Widmer. N. S, *Digital Systems: Principles and Applications*, Eighth edition, Pearson Education Pvt., Ltd.
2. Albert Paul Malvino& Donald P.Leach, GoutamSaha (2011), *Digital Principles and Applications*, Seventh Edition, Tata McGraw-Hill, New Delhi.
3. Floyd, *Digital Fundamentals*, 8/e, Pearson Education.

WEB RESOURCES:

https://digitalprinciples.org/principles/

Course Code 20UITA21	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	2	-	2	-	-
CO2	3	1	3	1	-	-	-
CO3	3	2	2	1	2	-	-
CO4	3	2	3	3	2	-	-
CO5	3	2	3	3	2	-	-

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

Dr.(Mrs).A.Bharathi Lakshmi
Head of the Department

Dr.(Mrs).D.ShunmugaKumari
Course Designer

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY

(2023-2024 onwards)

Semester I	**INTRODUCTION TO HTML**	Hours/Week: 2	
NME -2		Credits: 2	
Course Code **23UITN21**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: outline the basic HTML Commands of tags, text formatting, list and text effects for the emphasizing elements (bold, italic, and sizing), header elements, and color applying the software aspects of computer systems. [K1]

CO2: recognize the concepts of list, table, Hyper Links and frames for dividing the web browser window into multiple sections for developing technical project reports. [K1]

CO3: Summarize the customized web pages by formatting the lists of information in well-formed and semantic way to solve computational problems in real world based on their carrier. [K2]

CO4: Interpret the webpages by text styles,Lists,tables of bordering attributes and to perform different actions using Image Map and Frame Tags to apply current technical concepts and practices. [K2]

CO5: discover the web pages with graphic tools and text effects with images for designing the Forms and activate the Link for achieving technical project. [K3]

UNIT I

Introduction to Html: Hyper Text Markup Language (HTML) – Commonly Used HTML Commands – Titles and Footers – Text Formatting – Emphasizing Material in a Web Page – Text Styles – Other Text Effects. (7 Hours)

UNIT II

Lists: Types of Lists: Ordered List and Unordered List – Definition List. (5 Hours)

UNIT III

Tables: Using the Width and Border Attribute – Using the Cell Padding Attribute -Using the Cell Spacing Attribute - Using the Bgcolor Attribute - Using the Colspan and Row span attributes. (6 Hours)

UNIT IV

Linking Documents: Links: External & Internal Reference **–** Hyper Linking to a HTML File – Linking to a Particular Location in a Separate Document -Image as Hyper Links **–** Image Maps. (6 Hours)

UNIT V

Frames: Introduction to Frames**:** Frame Tag **–** Targeting Named Frames (6 Hours)

TEXT BOOK

Ivan Bayross, (2007). *Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI,* BPB Publication, 3rd Revised Edition.

UNIT	CHAPTER	PAGE NO.
I	2	15 – 30
II	3	33 – 36
III	5	47 – 56
IV	6	58 – 71
V	7	72 – 77

REFERENCE BOOKS

1. Gopalan, N.P. & Akilandeswari, J. (2007). *Web Technology,* Prentice Hall of India.
2. Deital & Deital (2004). *Internet and World Wide Web - How to Program,* Pearson Education, 3rd Edition.

WEB RESOURCES

https://www.tutorialspoint.com/microsoft_crm/microsoft_crm_html_web_resources.htm

https://www.w3schools.com/html/html_intro.asp

Course Code 20UITN21	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	3	3	1	1	2	1	1
CO 2	3	2	2	1	3	1	1
CO 3	3	2	3	M	3	1	1
CO 4	3	3	2	2	3	1	1
CO 5	3	3	3	2	3	1	1

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

Dr.(Mrs).A.Bharathi Lakshmi
Head of the Department

Dr.A.Bharathi Lakshmi
Course Designer

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 (3rd Cycle) by NAAC
VIRUDHUNAGAR - 626 001

B.SC. INFORMATION TECHNOLOGY
(2023-2024 onwards)

Semester II	**HARDWARE SIMULATOR PRACTICAL**	Hours/Week: 2	
SEC-2		Credits: 2	
Course Code **23UITS21P**		Internal 40	External 60

COURSE OUTCOMES:

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

CO 1 **:** Describe the basic gates and its logic diagram circuits to be designed digitally. [K2]

CO 2 **:** Design the universal gates, Adders and Subtractor with its truth table. [K2]

CO 3 **:** practice the combinational circuits and various variable reduction techniques of digital logic circuit in practically. [K3]

CO 4 **:** implement and record the hardware circuit to test performance and application for what it is being designed. [K3]

CO 5 **:** Construct counter and Registers with simulation software to obtain desired result. [K3]

Lab Exercises

1. Design a AND, OR, NOT gates
2. Design an Universal gates
3. Design a Half Adder
4. Design a Full Adder
5. Design a Half Subtractor
6. Design a Full Subtractor
7. Design a Flip flops
8. Design a Shift Registers
9. Design Counters.

Course Code 20UITS21P	**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	3	3	3	3	3	2	-	-
CO2	3	3	3	3	3	3	2	3	-	-
CO3	2	2	3	3	3	3	2	1	2	-
CO4	2	2	2	3	2	3	2	1	2	-
CO5	1	2	2	2	2	3	2	1	2	-

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

Dr.(Mrs).A.Bharathi Lakshmi
Head of the Department

Dr.(Mrs).J.Kalavathi
Course Designer