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 2020 - 2021)

V.V.Vanniaperumal College for Women, Virudhunagar, established in 1962, offers 20 UG Programmes, 14 PG Programmes, 6 M.Phil. 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 and Tamil

Physical & Life Sciences : Mathematics, Zoology, Chemistry, Physics, Biochemistry, Home Science - Nutrition and Dietetics, Costume Design and Fashion, Microbiology, Biotechnology, Computer Science, Information Technology and Computer Applications.

Commerce & Management : Commerce, Commerce with Computer Applications, Commerce with Professional Accounting, Business Administration.

PG PROGRAMMES

Arts & Humanities   : History, English, Tamil.

Physical & Life Sciences : Mathematics, Physics, Biochemistry, Food Processing & Quality Control, Chemistry, Zoology, Computer Science, Information Technology, Computer Applications (MCA*)

Commerce & Management : Commerce, Business Administration (MBA*)

            * AICTE approved Programmes

PRE-DOCTORAL PROGRAMMES (M.Phil.)

Arts &Humanities   : History, English, Tamil

Physical & Life Sciences : Mathematics, Biochemistry

Commerce & Management : Commerce

OUTLINE OF CHOICE BASED CREDIT SYSTEM (UG)

1. Core Courses
2. Discipline Specific Elective Courses (DSEC)
3. Allied Courses
4. Skill Enhancement Courses (SEC)
5. Non Major Elective Courses (NMEC)
6. Ability Enhancement Compulsory Courses (AECC)
7. Generic Elective Courses (GEC)
8. Internship / Field Project
9. Self-Study Courses
10. Extra Credit Courses (optional)

List of Non Major Elective Courses (NMEC) Offered

UG PROGRAMMES

Name of the Course	Semester	Department
History of India upto A.D.1858	III	History(EM)
இந்திய வரலாறு கி.பி. 1858 வரை	III	History (TM)
Indian National Movement (A.D 1885-1947)	IV	History(EM)
இந்திய தேசிய இயக்கம் (கி.பி. 1885 – 1947)	IV	History(TM)
English for Professions I	III	English
English for Professions II	IV	
இக்காலநீதி இலக்கியம்	III	Tamil
உரைநடை இலக்கியம்	IV	
Basic Hindi – I	III	Hindi
Basic Hindi – II	IV	
Practical Banking	III	Commerce
Basic Accounting Principles	IV	
Business Management	III	Business Administration
Entrepreneurship	IV	
Quantitative Aptitude – I	III	Mathematics
Statistics and Operation Research	IV	
Physics in Everyday life	III	Physics
Fundamentals of Electronics	IV	
Industrial Chemistry	III	Chemistry
Drugs and Natural Products	IV	
Applied Zoology	III	Zoology
Animal Science	IV	
Basic Food Science	III	Home Science – Nutrition and Dietetics
Basic Nutrition and Dietetics	IV	
Women and Health	III	Biochemistry
Life style associated disorders	IV	
Medical Lab Technology	III	Microbiology
Applied Microbiology	IV	
Infectious Diseases	III	Biotechnology
Organic Farming	IV	
Basics of Fashion	III	Costume Design And Fashion
Interior Designing	IV	
Introduction to Computers and Office Automation	III	Computer Science
Introduction to Internet and HTML 5	IV	
MS-Office	III	Information Technology
Introduction to HTML	IV	
Fundamentals of Computers	III	Computer Applications
Web Design with HTML	IV	
Horticulture – I	III	Botany
Horticulture – II	IV	
மருத்துவ தாவரவியல் - I	III	
மருத்துவ தாவரவியல் - II	IV	
Library and Information Science – I	III	Library Science
Library and Information Science – II	IV	

மேல்நிலை கல்வி வரை தமிழை முதன்மை பாடமாக எடுத்து படிக்காத மாணவிகள் கீழ்கண்ட பாடங்களை கட்டாயம் படிக்க வேண்டும்

1.   அடிப்படைத் தமிழ் - எழுத்தறிதல்

2.   அடிப்படைத் தமிழ் - மொழித்திறனறிதல்

List of Non Major Elective Courses (NMEC)

(2023-2024 onwards)

UG PROGRAMMES

Name of the Course	Semester	Department
History of India upto A.D.1858	III	History(EM)
இந்திய வரலாறு கி.பி. 1858 வரை	III	History (TM)
Indian National Movement (A.D 1885-1947)	IV	History(EM)
இந்திய தேசிய இயக்கம் (கி.பி. 1885 – 1947)	IV	History(TM)
English for Professions I	III	English
English for Professions II	IV	
இக்கால நீதி இலக்கியம்	III	Tamil
உரைநடை இலக்கியம்	IV	
Basic Hindi – I	III	Hindi
Basic Hindi – II	IV	
Fundamental Hindi - I	III	
Fundamental Hindi - II	IV	
Practical Banking	III	Commerce
Basic Accounting Principles	IV	
Financial Literacy I	III	
Financial Literacy II	IV	
Self-Employment And Start-Up Business	III	Commerce CA
Fundamentals Of Marketing	IV	
Women Protection Laws	III	Commerce (Professional Accounting)
Basic Labour Laws	IV	
Business Management	III	Business Administration
Entrepreneurship	IV	
Quantitative Aptitude I	III	Mathematics
Basic Statistics		
Quantitative Aptitude II	IV	
Operations Research		
Physics in Everyday life –I	III	Physics
Physics in Everyday life –II	IV	
Industrial Chemistry	III	Chemistry
Drugs and Natural Products	IV	
Applied Zoology	III	Zoology
Animal Science	IV	

Basic Food Science	III	Home Science – Nutrition and Dietetics
Basic Nutrition and Dietetics	IV	
Women and Health	III	Biochemistry
Lifestyle Associated Disorders	IV	
Medical Lab Technology	III	Microbiology
Applied Microbiology	IV	
Infectious Diseases	III	Biotechnology
Organic Farming	IV	
Basics of Fashion	III	Costume Design And Fashion
Interior Designing	IV	
Introduction to Computers and Office Automation	III	Computer Science
Introduction to Internet and HTML 5	IV	
MS Office	III	Information Technology
Introduction to HTML	IV	
Fundamentals of Computers	III	Computer Applications
Web Design with HTML	IV	
Horticulture – I	III	Botany
Horticulture – II	IV	
மருத்துவ தாவரவியல் - I	III	
மருத்துவ தாவரவியல் - II	IV	
Library and Information Science – I	III	Library Science
Library and Information Science – II	IV	
Cadet Corps for Career Development I	III	NCC
Cadet Corps for Career Development I	IV	

மேல்நிலைக் கல்வி வரை தமிழை முதன்மைப் பாடமாக எடுத்துப் படிக்காத மாணவிகள் கீழ்க்கண்ட பாடங்களைக் கட்டாயம் படிக்க வேண்டும்;

1. அடிப்படைத் தமிழ் - எழுத்தறிதல்
2. அடிப்படைத் தமிழ் - மொழித்திறனறிதல்

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

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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	Programme Educational Objectives (PEOs)		
	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   communicate proficiently and confidently with the ability to express original/complex ideas effectively in different situations. (*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 for the betterment of the society. (*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.

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 carrier.

PO4 - *Critical Thinking and Analytical Reasoning*

PSO 4. critically analyze the techniques in IT to provide technology based conclusions 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.

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

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

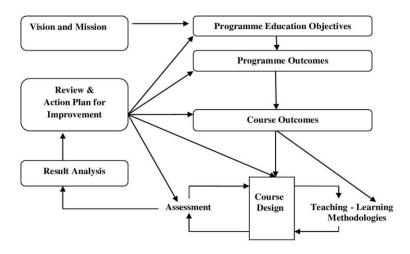**PSO 7:** demonstrate a sense of societal and ethical responsibility in their professional endeavors.

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	✓	✓	✓
PO2/PSO2	✓	✓	✓
PO3/PSO3	✓	✓	✓
PO4/PSO4	✓	✓	✓
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
	:	Allied 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	External Examination Marks	Total Marks
Theory	15	75	100
Practical	5+5	-	

INTERNAL ASSESSMENT

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	15
Practical	:	10
Total	**:**	**25**

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

B.2.1.1 PART II (II UG – 2023-2024 onwards)

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Test	15	60	100
Practical	10	15	

INTERNAL ASSESSMENT

Distribution of Marks

Mode of Evaluation		Marks
Periodic Test	:	15
Practical	:	10
Total	**:**	**25**

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

EXTERNAL ASSESSMENT
Distribution of Marks

Mode of Evaluation		Marks
Theory	:	60
Practical	:	15
Total	**:**	**75**

B.2.1 Part I & PART III - Core Courses, Discipline Specific Elective Courses & Allied Courses

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Theory	25	75	100
Practical	40	60	100
Project	100	-	100

INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			Marks
Periodic Test		:	15
Assignment	Core: I UG-K4 Level, II & III UG- K5 Level	:	5
	Part I &Allied: K4 Level		
	DSEC: K5 Level		
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
Periodic Test	:	30
Record and Performance	:	10
Total	**:**	**40**

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

Question Pattern for Periodic Tests   **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- 4)	Multiple Choice	4	4	1	4
B Q.No.(5- 7)	Internal Choice - Either Or Type	3	3	7	21
C Q.No.(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

EXTERNAL EXAMINATION

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	7	35
C Q. No. (16-18)	Internal Choice – Either Or Type	3	3	10	30
Total					**75**

PROJECT

Assessment by Internal Examiner only

Distribution of Marks

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

B.2.2 PART III - SELF STUDY COURSE

Core Courses Quiz – Online

Assessment by Internal Examiner only

- Question Bank is prepared by the Faculty Members of the Departments.
- 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	:	40
Model Examination	:	60
Total	**:**	**100**

Two Periodic Tests   - Better of the two will be considered

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B.2.3 PART IV - Skill Enhancement Courses & Non Major Elective Courses

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INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of Evaluation			Marks
Periodic Test		:	25
Assignment	SEC: K4 Level	:	10
	NMEC:K3 Level		
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

Practical

Mode of Evaluation		Marks
Periodic Test	:	30
Record and Performance	:	10
Total	**:**	**40**

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

Question Pattern   **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	5	15
B Q. No.(4)	Internal Choice (Either-or Type)	1	1	10	10
Total					**25**

EXTERNAL EXAMINATION

Question Pattern   **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- 3)	Internal Choice (Either-or Type)	6	6	5	30
B Q. No.(7-9)	Internal Choice (Either-or Type)	3	3	10	30
				Total	**60**

B.2.4 PART IV- Ability Enhancement Compulsory Courses (AECC) & Generic Elective Courses (GEC)

Assessment by Internal Examiner only

➢ Model Examination is conducted after two periodic tests.

➢ Book and Study Material prepared by the Faculty Members of the respective departments will be prescribed.

Distribution of Marks

Mode of Evaluation			Marks
Periodic Test		:	30
Assignment	K2 Level	:	10
Model Examination		:	60
Total		**:**	**100**

Two Periodic tests   - Better of the two will be considered

Two Assignments   - Better of the two will be considered

Question Pattern for Periodic Test   **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**

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.2.5 SELF STUDY COURSE

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	:	40
Model Examination	:	60
Total	**:**	**100**

Two Periodic Tests   - Better of the two will be considered

B.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.

➢   Pass minimum for Internal Practical is 19 marks out of 40 marks.

➢   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

(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.

Attainment Levels of COs

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

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

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

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 attainment of 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 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	PO4	PO5	PO6	PO7	PO8
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
Value $>=$ 70%	Excellent
Value $>=$ 60 % and Value < 70%	Very Good
Value $>=$ 50 % and Value < 60%	Good
Value $>=$ 40% and Value < 50%	Satisfactory
Value < 40%	Not Satisfactory

Level of PO attainment

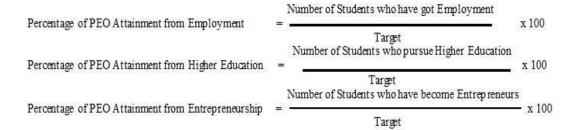| Graduation Batch	Overall PO Attainment (in percentage)	Whether Expected Level of PO is Achieved? (Yes/No)

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	25% of the class strength	30% of the class strength
Progression to Higher Education	40% 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
Value $>=$ 70%	Excellent
Value $>=$ 60 % and Value < 70%	Very Good
Value $>=$ 50 % and Value < 60%	Good
Value $>=$ 40% and Value < 50%	Satisfactory
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. Programme.

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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 2020 - 2021

Components	Semester						Total Number of Hours / Credits
	I	II	III	IV	V	VI	
Part I : Tamil /Hindi	6 (3)	6 (3)	5(3)	5 (3)	-	-	22(12)
Part II : English	6(3)	6(3)	6(3)	6 (3)	-	-	24(12)
Part III : Core, Allied and DSEC Courses:							
Core Course	5(4)	5(4)	4(4)	4(4)	5(5)	5 (5)	28(26)
Core Course	-	-	4(3)	-	5 (5)	5 (5)	14(13)
Core Course	-	-	-	-	5 (5)	5 (5)	10(10)
Core Course Practical	5 (3)	5 (3)	4 (2)	4 (2)	5 (2)	5 (2)	28(14)
DSEC	-	-	-	-	4 (4)	4 (4)	8 (8)
DSEC Practical	-	-	-	-	4 (2)	4 (2)	8 (4)
Project					0(1)	-	0(1)
Allied 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)	2 (2)	-	2 (2)	-	2 (2)	8 (8)
SEC	-	2 (2)	-	2 (2)	-	-	4 (4)
Non Major Elective	-	-	2 (2)	2 (2)	-	-	4 (4)
AECC 1 (Value Education)	2 (2)	-	-	-	-	-	2 (2)
AECC 2 (Environmental Studies)	-	-	-	-	2 (1)	-	2 (1)
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 (21)**	**30 (21)**	**30 (22)**	**30 (24)**	**30 (26)**	**30 (26)**	**180 (140)**
Extra Credit Course					0(2)		0(2)

DSEC: Discipline Specific Elective Course   SEC: Skill Enhancement Course

AECC: Ability Enhancement Compulsory Course   GEC: Generic Elective Course

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PART I-TAMIL

S.No.	Sem.	Code	Title of Paper	Credits	Marks
1.	I	20UTAG11	பொதுத்தமிழ் தாள் I	3	100
2.	II	20UTAG21	பொதுத்தமிழ் தாள் II	3	100
3.	III	20UTAG31C	கணினி தமிழ் I	3	100
4.	IV	20UTAG41C	கணினி தமிழ் II	3	100
	Total			**12**	**400**

PART I –HINDI

S. No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	20UHDG11/ 22UHDG11	Hindi - Paper I Prose – I & II, Ancient Stories - I, General Essays, Functional Hindi – I & Grammar/ General Hindi - I	3	100
2.	II	20UHDG21/ 22UHDG21	Hindi - Paper II Drama, One Act Play, Letter, Correspondence, Functional Hindi – II & Grammar / General Hindi - II	3	100
3.	III	20UHDG31/ 22UHDG31	Hindi - Paper III Ancient Poetry, Drama, Indian History, Hindi Grammar & Functional Hindi III/ Advanced Hindi - I	3	100
4.	IV	20UHDG41/2 22UHDG41	Hindi - Paper IV Modern Poetry, Hindi Literary Essays, Letter Correspondence, Conversation & Functional Hindi IV/ Advanced Hindi - II	3	100
			TOTAL	**12**	**400**

PART II – ENGLISH

S. No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	20UENG11A/ 20UENG11B/ 20UENG11C	English – Paper I English for Advanced Learners – I English for Career Guidance – I English for Communicative Competence-I	3	100
2.	II	20UENG21A/ 20UENG21B/ 20UENG21C	English – Paper II English for Advanced Learners – II English for Career Guidance – II English for Communicative Competence – II	3	100
3.	III		English – Paper III	3	100

		20UENG31A/	English for Advanced Learners – III		
		20UENG31B/	English for Career Guidance – III		
		20UENG31C/	English for Communicative Competence – III/		
		22UENG31	Communicative English- I		
4.	IV		English – Paper IV	3	100
		20UENG41A/	English for Advanced Learners – IV		
		20UENG41B/	English for Career Guidance – IV		
		20UENG41C/	English for Communicative Competence – IV/		
		22UENG31	Communicative English- II		
			Total	**12**	**400**

PART III – CORE COURSES, DISCIPLINE SPECIFIC ELECTIVE COURSES

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1	I	20UITC11	Introduction to IT and Programming in C	4	100
2	I	20UITC11P	Programming in C lab	3	100
3	II	20UITC21	Advanced Concepts in C and Data Structures	4	100
4	II	20UITC21P	Data structures using C Lab	3	100
5	III	20UITC31	Data Base Management Systems	4	100
		20UITC31N	Data Base Management Systems		
6	III	20UITC32	Operating Systems	3	100
7	III	20UITC31P	RDBMS Lab	2	100
8	IV	20UITC41	PHP and MYSQL	4	100
	IV	22UITC41	Java Programming		
9	IV	20UITC41P	Web Design using PHP Lab	2	100
	IV	22UITC41P	Java Programming Lab		
10	V	20UITC51	VB .Net Programming	5	100
11	V	20UITC52	Software Engineering	5	100
12	V	20UITC53	Design and Analysis of Computer Algorithms	5	100
13	V	20UITC51P	VB .Net Programming Lab	2	100
14	V	20UITE51/ 20UCAE51/ 20UITE52	System Software / Computer Graphics / Cloud Computing	4	100
15	V	20UITE51P/ 20UCAE51P/ 20UITE52P	System Testing Lab Computer Graphics Programming Lab Linux Programming Lab	2	100
16	V	20UITC5PR	Project	1	100
17	VI	20UITC61	Java Programming	5	100
	VI	22UITC61	PHP and MySQL		
18	VI	20UITC62	BlockChain Technology	5	100
19	VI	20UITC63	Computer Networks	5	100
20	VI	20UITC61P	Java Programming Lab	2	100
	VI	22UITC61P	Web Design Using PHP Lab		
21	VI	20UCAE61/ 20UITE62/	Mobile Application Development Cyber Security	4	100

		20UITE63	Embedded Systems		
22	VI	20UCAE61P/ 20UITE62P/ 20UITE63P	Mobile Application Development Lab UML Designing Lab R Programming Lab	2	100
23	VI	20UITQ61	Core Courses Quiz -Online	1	100
			Total	**77**	**2300**

PART III – ALLIED COURSES

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	20UITA11	Digital Principles and Applications	4	100
2.	II	20UITA21	Discrete Mathematics	4	100
		20UITA21N	Discrete Mathematics		
3.	III	20UITA31	Numerical Methods	4	100
4.	IV	22UITA41	Data Analytics with Data Science	4	100
Total				**16**	**400**

PART IV – SKILL ENHANCEMENT COURSES

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	20UITS11P	Hardware Simulator Lab	2	100
2.	II	20UITS21	Object Oriented Programming in C++	2	100
3.	II	20UITS21P	Object Oriented Programming using C++ Lab	2	100
4.	IV	20UITS41	Numerical Aptitude	2	100
		20UITS41N	Numerical Aptitude		
5.	IV	20UITS41PN	Multimedia Lab	2	100
6.	VI	20UITS61P	Python Programming Lab	2	100
Total				**12**	**600**

PART IV – NON MAJOR ELECTIVE COURSES

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1	III	20UITN31	MS-Office	2	100
2	IV	20UITN41	Introduction to HTML	2	100
		20UITN41N			
Total				**4**	**200**

PART IV– ABILITY ENHANCEMENT COMPULSORY COURSES AND GENERIC ELECTIVE COURSES

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1.	I	20UGVE11	Value Education	2	100
	V	20UGES51	Environmental Studies	1	100
2.	III	20UGEH31 20UGEW32	Human Rights / Women Studies	1	100
3.	IV	20UGEC41/ 20UGEM42/ 20UGEA43/ 20UGED44	Constitution of India / Modern Economics / Adolescent Psychology / Disaster Management	1	100
4.	V	20UGCE51	Practice for Competitive Examinations - Online	1	100
	Total			**6**	**500**

PART –V - EXTENSION ACTIVITIES

S.No.	Sem.	Code	Extension Activity	Credit
1	I, II, III & IV	20UVNS1, 20UVNS2	National Service Scheme	1
2		20UVNS2	Physical Education	
3		20UVYR1 20UVYR2	Youth Red Cross Society	
4		20UVRR1	Red Ribbon Club	
5		20UVSF1	Science Forum	
6		20UVEC1	Eco Club	
7		20UVLI1	Library and Information Science	
8		20UVCC1	Consumer Club	
9		20UVHF1	Health and Fitness Club	
10		20UVNC1 20UVNC2	National Cadet Corps	
11		20UVRO1	Rotaract Club	

EXTRA CREDIT COURSES (Optional)

S.No.	Sem.	Code	Title of the Course	Credits	Marks
1	V	20UITO51	Computer Organization	2	100

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B.Sc. INFORMATION TECHNOLOGY
PROGRAMME CONTENT
Programme Code – 2025
SEMESTER I

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
I	Part I	20UTAG11/ 20UHDG11	Tamil / Hindi Course I	6	3	3	25	75	100
	Part II	20UENG11A/ 20UENG11B/ 20UENG11C	English Course I	6	3	3	25	75	100
	Part III	20UITC11	**Core Course 1** Introduction to IT and Programming in C	5	4	3	25	75	100
		20UITC11P	**Core Course Practical 1** Programming in C Lab	5	3	3	40	60	100
		20UITA11	**Allied Course 1** Digital Principles and Applications	4	4	3	25	75	100
	Part IV	20UITS11P	**Skill Enhancement Course Practical 1 (SEC Practical 1)** Hardware Simulator Lab	2 (1T*+1P')	2	2	40	60	100
		20UGVE11	Value Education	2	2	-	100	-	100
			TOTAL	**30**	**21**				**700**

B.SC.IT- SEMESTER II

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
II	Part I	20UTAG21/ 20UHDG21	Tamil / Hindi Course II	6	3	3	25	75	100
	Part II	20UENG21A/ 20UENG21B/ 20UENG21C	English Course II	6	3	3	25	75	100
	Part III	20UITC21	**Core Course 2** Advanced Concepts in C and Data Structures	5	4	3	25	75	100
		20UITC21P	**Core Course Practical 2** Data Structures using C Lab	5	3	3	40	60	100
		20UITA21	**Allied Course 2** Discrete Mathematics	4	4	3	25	75	100
	Part IV	20UITS21	**Skill Enhancement Course 1 (SEC 1)** Object Oriented Programming in C++	2	2	2	40	60	100
		20UITS21P	**Skill Enhancement Course Practical 2 (SEC Practical 2)** Object Oriented Programming using C++ Lab	2 (1T*+1P')	2	2	40	60	100
			TOTAL	30	21				700

B.SC.IT- SEMESTER III

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
III	Part I	20UTAG31C/ 20UHDG31	Tamil / Hindi Course III	5	3	3	25	75	100
	Part II	20UENG31A/ 20UENG31B/ 20UENG31C	English Course III	6	3	3	25	75	100
	Part III	20UITC31	**Core Course 3** Data Base Management Systems	4	4	3	25	75	100
		20UITC32	**Core Course 4** Operating Systems	4	3	3	25	75	100
		20UITC31P	**Core Course Practical 3** RDBMS Lab	4	2	3	40	60	100
		20UITA31	**Allied-Course 3** Numerical Methods	4	4	3	25	75	100
	Part IV	20UITN31	**NMEC 1** MS-Office	2 (1T*+1P')	2	2	40	60	100
		20UGEH31 20UGEW32	**GEC 1** 1.Human Rights/ 2. Women Studies	1	1	2	100	-	100
			TOTAL	**30**	**22**				**800**

B.SC.IT- SEMESTER IV

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
IV	Part I	20UTAG41C/ 20UHDG41	Tamil / Hindi Course IV	5	3	3	25	75	100
	Part II	20UENG41A/ 20UENG41B/ 20UENG41C	English Paper IV	6	3	3	25	75	100
	Part III	20UITC41	**Core Course 5** PHP and MYSQL	4	4	3	25	75	100
		20UITC41P	**Core Course Practical 4** Web Design using PHP Lab	4	2	3	40	60	100
		20UITA41	**Allied Course 4** Data Analytics	4	4	3	25	75	100
	Part IV	20UITS41	**Skill Enhancement Course 2 (SEC 2)** Numerical Aptitude	2	2	2	40	60	100
		20UITS41P	**Skill Enhancement Course Practical 3 (SEC Practical 3)** Multimedia Lab	2 (1T*+1P')	2	2	40	60	100
		20UITN41	**NMEC 2** Introduction to HTML	2 (1T*+1P')	2	2	40	60	100
		20UGEC41/ 20UGEM42/ 20UGEA43/ 20UGED44	GEC 2 Constitution of India/ Modern Economics/ Adolescent Psychology/ Disaster Management	1	1	2	100	-	100
	Part V		Extension Activities	-	1		100	-	100
			TOTAL	**30**	**24**				**1000**

B.SC.IT- SEMESTER V

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
V	Part III	20UITC51	**Core Course 6** VB.Net Programming	5	5	3	25	75	100
		20UITC52	**Core Course 7** Software Engineering	5	5	3	25	75	100
		20UITC53	**Core Course 8** Design and analysis of Computer Algorithms	5	5	3	25	75	100
		20UITC51P	**Core Course Practical 5** VB.Net Programming Lab	5	2	3	40	60	100
		20UITE51/ 20UCAE52/ 20UITE53	**Discipline Specific Elective Course 1 (DSEC 1)** System Software Computer Graphics Cloud Computing	4	4	3	25	75	100
		20UITE51P/ 20UCAE52P/ 20UITE53P	**Discipline Specific Elective Course 2 Practical (DSEC 2)** System Testing Lab Computer Graphics Programming Lab Linux Programming Lab	4	2	3	40	60	100
		20UITC5PR	Project	0	1	-	100		100
	Part IV	20UGCE51	Practice for Competitive Examinations - Online	-	1	-	100		100
		20UGES51	Environmental Studies	2	1	2	100	-	100
			TOTAL	**30**	**26**				**900**

B.SC.IT- SEMESTER VI

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
VI	Part III	20UITC61	**Core Course 9** Java Programming	5	5	3	25	75	100
		20UITC62	**Core Course 10** BlockChain Technology	5	5	3	25	75	100
		20UITC63	**Core Course 11** Computer Networks	5	5	3	25	75	100
		20UITC61P	**Core Course Practical 6** Java Programming Lab	5	2	3	40	60	100
		20UCAE61/ 20UITE62/ 20UITE63	**Discipline Specific Elective Course 3 (DSEC 3)** Mobile Application Development Cyber Security Embedded Systems	4	4	3	25	75	100
		20UCAE61P/ 20UITE62P/ 20UITE63P	**Discipline Specific Elective Course 4 Practical (DSEC 4)** Mobile Application Development Lab UML Designing Lab R Programming Lab	4	2	3	40	60	100
		20UITQ61	**Self Study Course** Core Courses Quiz – Online	-	1	-	100		100
	Part IV	20UITS61P	**Skill Enhancement Course Practical 4 (SEC Practical 4)** Python Programming Lab	2 (1T*+1P')	2	2	40	60	100
			TOTAL	**30**	**26**				**800**

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B.Sc. INFORMATION TECHNOLOGY
Programme Code – 2025
REVISED PROGRAMME CONTENT
SEMESTER I

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
I	Part I	20UTAG11/ 20UHDG11	Tamil / Hindi Course I	6	3	3	25	75	100
	Part II	20UENG11A/ 20UENG11B/ 20UENG11C	English Course I	6	3	3	25	75	100
	Part III	20UITC11	**Core Course 1** Introduction to IT and Programming in C	5	4	3	25	75	100
		20UITC11P	**Core Course Practical 1** Programming in C Lab	5	3	3	40	60	100
		20UITA11	**Allied Course 1** Digital Principles and Applications	4	4	3	25	75	100
	Part IV	20UITS11P	**Skill Enhancement Course Practical 1 (SEC Practical 1)** Hardware Simulator Lab	2 (1T*+1P')	2	2	40	60	100
		20UGVE11	Value Education	2	2	-	100	-	100
			TOTAL	30	21				700

B.SC.IT- SEMESTERII

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
II	Part I	20UTAG21/ 20UHDG21	Tamil / Hindi Course II	6	3	3	25	75	100
	Part II	20UENG21A/ 20UENG21B/ 20UENG21C	English Course II	6	3	3	25	75	100
	Part III	20UITC21	**Core Course 2** Advanced Concepts in C and Data Structures	5	4	3	25	75	100
		20UITC21P	**Core Course Practical 2** Data Structures using C Lab	5	3	3	40	60	100
		20UITA21N	**Allied Course 2** Discrete Mathematics	4	4	3	25	75	100
	Part IV	20UITS21	**Skill Enhancement Course 1 (SEC 1)** Object Oriented Programming in C++	2	2	2	40	60	100
		20UITS21P	**Skill Enhancement Course Practical 2 (SEC Practical 2)** Object Oriented Programming using C++ Lab	2 (1T*+1P')	2	2	40	60	100
			TOTAL	30	21				700

B.Sc.IT – SEMESTER III

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
III	Part I	20UTAG31C/ 20UHDG31	Tamil / Hindi Course III	5	3	3	25	75	100
	Part II	20UENG31A/ 20UENG31B/ 20UENG31C	English Course III	6	3	3	25	75	100
	Part III	20UITC31N	**Core Course 3** Data Base Management Systems	4	4	3	25	75	100
		20UITC32	**Core Course 4** Operating Systems	4	3	3	25	75	100
		20UITC31P	**Core Course Practical 3** RDBMS Lab	4	2	3	40	60	100
		20UITA31	**Allied-Course 3** Numerical Methods	4	4	3	25	75	100
	Part IV	20UITN31	**NMEC 1** MS-Office	2 (1T*+1P')	2	2	40	60	100
		20UGEH31 20UGEW32	**GEC 1** 1.Human Rights/ 2. Women Studies	1	1	2	100	-	100
			TOTAL	**30**	**22**				**800**

B.SC.IT- SEMESTER IV

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
IV	Part I	20UTAG41C/ 20UHDG41	Tamil / Hindi Course IV	5	3	3	25	75	100
	Part II	20UENG41A/ 20UENG41B/ 20UENG41C	English Paper IV	6	3	3	25	75	100
	Part III	22UITC41	**Core Course 5** Java Programming	4	4	3	25	75	100
		22UITC41P	**Core Course Practical 4** Java Programming Lab	4	2	3	40	60	100
		22UITA41	**Allied Course 4** Data Analytics with Data Science	4	4	3	25	75	100
	Part IV	20UITS41N	**Skill Enhancement Course 2 (SEC 2)** Numerical Aptitude	2	2	2	40	60	100
		20UITS41PN	**Skill Enhancement Course Practical 3 (SEC Practical 3)** Multimedia Lab	2 (1T*+1P')	2	2	40	60	100
		20UITN41N	**NMEC 2** Introduction to HTML	2 (1T*+1P')	2	2	40	60	100
		20UGEC41/ 20UGEM42/ 20UGEA43/ 20UGED44	GEC 2 Constitution of India/ Modern Economics/ Adolescent Psychology/ Disaster Management	1	1	2	100	-	100
	Part V		Extension Activities	-	1		100	-	100
			TOTAL	**30**	**24**				**1000**

B.SC.IT- SEMESTER V

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
V	Part III	20UITC51	**Core Course 6** VB.Net Programming	5	5	3	25	75	100
		20UITC52	**Core Course 7** Software Engineering	5	5	3	25	75	100
		20UITC53	**Core Course 8** Design and analysis of Computer Algorithms	5	5	3	25	75	100
		20UITC51P	**Core Course Practical 5** VB.Net Programming Lab	5	2	3	40	60	100
		20UITE51/ 20UCAE52/ 20UITE53	**Discipline Specific Elective Course 1 (DSEC 1)** System Software Computer Graphics Cloud Computing	4	4	3	25	75	100
		20UITE51P/ 20UCAE52P/ 20UITE53P	**Discipline Specific Elective Course 2 Practical (DSEC 2)** System Testing Lab Computer Graphics Programming Lab Linux Programming Lab	4	2	3	40	60	100
		20UITC5PR	Project	0	1	-	100		100
	Part IV	20UGCE51	Practice for Competitive Examinations - Online	-	1	-	100		100
		20UGES51	Environmental Studies	2	1	2	100	-	100
			TOTAL	**30**	**26**				**900**

B.SC.IT- SEMESTER VI

Semester		Course Code	Courses	Hours per week	Credits	Exam. Hours	Marks		
							Int.	Ext.	Total
VI	Part III	22UITC61	**Core Course 9** PHP and MySQL	5	5	3	25	75	100
		20UITC62	**Core Course 10** BlockChain Technology	5	5	3	25	75	100
		20UITC63	**Core Course 11** Computer Networks	5	5	3	25	75	100
		22UITC61P	**Core Course Practical 6** Web Design using PHP Lab	5	2	3	40	60	100
		20UCAE61/ 20UITE62/ 20UITE63	**Discipline Specific Elective Course 3 (DSEC 3)** Mobile Application Development Cyber Security Embedded Systems	4	4	3	25	75	100
		20UCAE61P/ 20UITE62P/ 20UITE63P	**Discipline Specific Elective Course 4 Practical (DSEC 4)** Mobile Application Development Lab UML Designing Lab R Programming Lab	4	2	3	40	60	100
		20UITQ61	**Self Study Course** Core Courses Quiz – Online	-	1	-	100		100
	Part IV	20UITS61P	**Skill Enhancement Course Practical 4 (SEC Practical 4)** Python Programming Lab	2 (1T*+1P')	2	2	40	60	100
			TOTAL	**30**	**26**				**800**

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 – 2021 onwards)

Semester I		Hours/Week: 5	
Core Course 1	**INTRODUCTION TO IT AND PROGRAMMING IN C**	Credits: 4	
Course Code		Internal	External
20UITC11		25	75

COURSE OUTCOMES

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

CO1: outline the basics of Information Technology and programming fundamentals to enhance the students learning. [K1]

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

CO3: extend the concepts of C Programming that includes various C statements, 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 C programming environment with variables, data types, numerous statements and functions, Input/output Operations, Arrays to improve their programming skills. [K3]

CO5: scrutinize all fundamental programming statements, functions and Arrays in C to develop their real time projects in the field of Information Technology. [K4]

UNIT I

Information Technology Today – An Overview: Information Technology – An Introduction – Information Systems – Software and Data – IT in Business Industry – IT in the Home and Play – IT in Education and Training – IT in Entertainment and the Arts – IT in Science, Engineering and Math.

Overview of C: History of C – Importance of C – Basic structure of C – Programming style – Executing a 'C' Program. (15 Hours)

UNIT II

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.

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.   (10 Hours)

UNIT III

Managing Input and Output Operations: Reading a Character – Writing a Character-Formatted Input- Formatted Output.

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.   (15 Hours)

TEXT BOOKS

1. Dennis Curtin, *Information Technology, The Breaking Wave*, 23rd Reprint, Tata McGraw- Hill publication.

2. Balagurusamy.E (2010), *Programming in ANSI C*, Edition 6, Tata McGraw-Hill Publishing Company.

UNIT	CHAPTER	SECTION
I	In book 1 – 2	2.1 – 2.8
	In book 2 – 1	1.1,1.2, 1.8-1.10
II	In book 2 – 2,3	2.2-2.14 , 3.2-3.12, 3.14-3.16
III	In book 2 – 4, 5, 6	4.2-4.5, 5.3-5.9, 6.2-6.4
IV	In book 2 – 7 ,8	7.2-7.7, 8.2- 8.8
V	In book 2 – 9	9.4-9.13, 9.15, 9.16

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.

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	H	H	-	H	L	M	H	M	H	-
CO2	H	M	L	M	M	L	H	M	M	-
CO3	H	M	M	L	M	L	M	M	-	-
CO4	H	H	H	H	H	M	M	H	H	-
CO5	M	H	M	M	H	M	M	H	H	-

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 -2021 onwards)

Semester I		Hours/Week: 5	
Core Practical 1	**PROGRAMMING IN C LAB**	Credits: 3	
Course Code		Internal	External
20UITC11P		40	60

COURSE OUTCOMES

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

CO1: apply and trace the concept of the programs. [K3]

CO2: capture the logic and the C programming Statements to solve the problem. [K3] CO3: construct the algorithm and implement the concept using C Programming Statements. [K3]

CO4: prepare the record with the concepts of Function, Arrays and Strings in C. [K3]

CO5: examine the concepts of Function, Arrays and Strings to solve real time computer problems. [K4]

Lab Exercises

1. Write a program to find a.

   Largest number

   b. reverse of a given number c.

   factorial of a given number

2. Write a program to convert a.

   decimal to binary

   b. binary to decimal

3. Write a program to check whether given number is perfect or not.

4. Write a program to calculate sum of digits.

5. Write a program to read the text and count the number of vowels, Constants and digits in it.

6. Write a program to check whether given number is prime or not.

7. Write a program to check whether given number is Armstrong or not

8. Write a program to find the sum, average, standard deviation for the given n numbers using switch case.

9. Write a program to count the positive, negative and zeros among n numbers using one dimensional array.

10. Write a program to check whether given string is palindrome or not using one dimensional array.

11. Write a program to perform matrix addition, subtraction, multiplication using two dimensional array.

12. Write a program to sort the list of names and sort the list of integers in ascending order using functions.

13. Write a program to find the factorial of a given number using functions

14. Write a program to find sum of series using functions

15. Write a program to reverse the text using recursion concept.

Course Code 20UITC11P	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	H	H	H	H	H	H	H	M	M	-
CO2	H	H	H	H	H	H	M	H	M	-
CO3	M	M	H	H	H	M	M	M	H	-
CO4	M	M	H	H	M	H	M	M	M	-
CO5	L	L	H	H	M	H	L	M	M	-

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B.Sc. INFORMATION TECHNOLOGY

(2020-2021 onwards)

Semester I	**DIGITAL PRINCIPLES AND APPLICATIONS**	Hours/Week: 4	
Allied Course 1		Credits: 4	
Course Code 20UITA11		Internal 25	External 75

COURSE OUTCOMES

On Completion of this course, the students will be able to

CO1: recognize number system over Boolean data and outline the arithmetic and combinational circuits using counters and registers in digital logic system. [K1]

CO2: classify various structure of number systems, counters and registers articulating in logic gates, digital circuit designing representations. [K2]

CO3: interpret the knowledge of available coding system, minimization techniques, Flip flops, registers, counters, gates and how to prevent various hazards and timing problems in a digital design. [K2]

CO4: illustrate strong foundations on accessible codes, Boolean Algebra, Logic gates, various combinational and sequential circuits, counters and registers to design the circuits effectively. [K3]

CO5: correlate 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. [K4]

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) – De-multiplexers (Data Distributors) – Decoders – Encoders - 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. (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, 6.5.6, 6.5.9), 6.7(6.7.1, 6.7.2), 6.8, 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.

Course Code 20UITA11	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	-	M	-	M	-	-
CO2	H	L	H	L	-	-	-
CO3	H	M	M	L	M	-	-
CO4	H	M	H	H	M	-	-
CO5	H	M	H	H	M	-	-

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B.Sc. INFORMATION TECHNOLOGY

(2020-2021 Onwards)

Semester I		Hours/Week: 2	
SEC Practical 1	**HARDWARE SIMULATOR LAB**	Credits: 2	
Course Code **20UITS11P**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: determine the circuit to be designed digitally. [K3]

CO2: Construct the simulated circuit model with hardware implementation to design their circuits effectively. [K3]

CO3: practice the basic logic gates and various variable reduction techniques of digital logic circuit in detail. [K3]

CO4: implement and record the hardware circuit to test performance and application for what it is being designed. [K3]

CO5: analyze the computer simulation software to obtain desired result. [K4]

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 a Counters.

Course Code 20UITS11P	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	H	H	H	H	H	H	H	M	-	-
CO2	H	H	H	H	H	H	M	H	-	-
CO3	M	M	H	H	H	H	M	L	M	-
CO4	M	M	M	H	M	H	M	L	M	-
CO5	L	M	M	M	M	H	M	L	M	-

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(2020 - 2021 onwards)

Semester II		Hours/Week: 5	
Core Course 2	**ADVANCED CONCEPTS IN C AND DATA STRUCTURES**	Credits: 4	
Course Code **20UITC21**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: tabulate the difference of structures, unions, Files and the types of ordered list that helps to enhance their learning. [K1]

CO2: recognize the size of memory allocated in variables inside the structure and union to gain their knowledge. [K2]

CO3: implement the Structured programs to develop the applications based on linear data structures such as stack, queue, linked list for better utilization of system resources. [K3]

CO4: scrutinize the various file operations and different types of linked list implementation in data structures to build an intelligent system by using information theory calculations. [K4]

CO5: explore the knowledge in programming to implement data structures and Advanced C concepts in their higher studies to lead a project team effectively. [K4]

UNIT I

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.   (14 Hours)

UNIT II

Pointers: Understanding Pointers – Accessing the Address of a Variable – Declaring Pointer Variables - Initialization of Pointer Variables – Accessing a Variable through its Pointer.

File Management in C: Defining and Opening a File - Closing File – Input / Output Operations on Files – Command Line Arguments.   (18 Hours)

UNIT III

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.   (16 Hours)

UNIT IV

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

UNIT V

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

Queues: Definition – Representation of Queues **–** Various Queue Structures – Circular Queue –Deque.   (12 Hours)

TEXT BOOKS

1. Balagurusamy.E (2010), *Programming in ANSI C*, Edition 6, Tata McGraw-Hill Publishing Company.

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

UNIT	CHAPTERS	SECTIONS
I	In book 1 -10	10.2-10.13
II	In book 1-11,12	11.2-11.6 , 12.2-12.4,12.7
III	In book 2- 1,2	1.1-1.4, 2.1-2.5
IV	In book 2- 3	3.1-3.4
V	In book 2- 4,5	4.2-4.4, 5.2-5.4(5.4.1,5.4.2)

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.

Course Code 20UITC21	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	H	M	M	H	M	L	H	M	M	-
CO2	H	H	L	H	M	M	M	H	M	-
CO3	H	H	H	M	H	H	H	M	H	-
CO4	H	H	L	M	H	M	H	M	M	-
CO5	H	H	H	H	H	M	M	H	H	-

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B.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester II	**DATA STRUCTURES USING C LAB**	Hours/Week: 5	
Core Practical 2		Credits: 3	
Course Code **20UITC21P**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: apply the concepts of data structure, data type and array data structure to enhance their learning. [K3]

CO2: prepare data structure algorithms to solve various problems in IT effectively and professionally. [K3]

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: analyze algorithms and determine their time complexity for better utilization of system resources. [K4]

Lab Exercises

1. Write a program to create and process employee pay bill system using structures.

2. Write a program to prepare a student mark statement using structures.

3. Write a program to swap the two numbers using pointers.

4. Write a program to determine length of a character string using pointers.

5. Write a program to count the number of lines, words, characters in a file.

6. Write a program to separate odd and even numbers using file.

7. Write a program to perform linear search using array.

8. Write a program to perform binary search using array.

9. Write a program to perform Singly Linked List Operations.

10. Write a program to perform stack operation using array.

11. Write a program to perform Queue operation using array

12. Write a program to perform stack operation using Linked List

13. Write a program to perform Queue operation using Linked List.

Course Code 20UITC21P	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	H	H	H	H	H	H	M	H	L	-
CO2	H	H	H	H	H	H	H	M	L	-
CO3	M	M	H	H	H	H	M	H	H	-
CO4	L	M	H	H	M	H	H	M	H	-
CO5	L	M	H	H	L	H	M	L	H	-

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Head of the Department   Course Designer

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester II		Hours/Week: 4	
Allied Course 2	**DISCRETE MATHEMATICS**	Credits: 4	
Course Code **20UITA21**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: recollect the elementary concepts of Groups, Combinatorics and Matrix Algebra in interdisciplinary field. [K1]

CO2: explain the mathematical concepts such as Relations, Functions, basic counting principles, algorithms and algebraic structure. [K2]

CO3: describe the notions of technical concepts in algebraic systems, Matrix Algebra, Recursion and Generating Functions. [K2]

CO4: apply the knowledge gained in Discrete Mathematics to exhibit equivalence classes, various types of functions, recurrence relations, matrix algebra and Group theory. [K3]

CO5: analyze the theory of groups, proofs and techniques of mathematical induction and generating functions. [K4]

UNIT I

Relations: Cartesian product of two Sets – Relations – Representation of relation – Operations on relations – Equivalence relations - Closures and Warshall's algorithm (Excluding Theorems) – Partitions and Equivalence classes. (10 Hours)

UNIT II

Functions and Mathematical Induction: Functions : Functions and operators - One – to – one, Onto functions - Special types of functions – Invertible functions - Composition of functions.

Mathematical Induction: Techniques of proof – Mathematical Induction.

(15 Hours)

UNIT III

Recurrence Relations and Generating Functions: Recurrence Relations: Recurrence – An introduction - Polynomials and their evaluations – Recurrence relations - Solution of finite order homogenous (Linear) relations - Solution of Non – homogenous relations.

Generating Functions: Generating functions – Some common recurrence relations.
(15 Hours)

UNIT IV

Matrix Algebra: (Sections Excluding Theorems) - Introduction - Matrix operations - The inverse of a square matrix - Elementary operations and Rank of a matrix – Simultaneous linear equations – Inverse by partitioning – Eigen values and Eigen vectors. (10 Hours)

UNIT V

Algebraic Systems: Groups – Order of a Group – Subgroup of a Group – Cyclic Groups – Cosets – Normal Subgroups. (10 Hours)

TEXT BOOK

Dr.Venkataraman.M.K, Dr. Sridharan.N, Chandrasekaran.N (2012), *Discrete Mathematics*, The National Publishing Company Basement.

UNIT I	Chapter II	Section – 1 to 7	Page No: 2.0 – 2.44
UNIT II	Chapter III	Section – 1 to 5	Page No: 3.0 - 3.20
	Chapter IV	Section – 1 to 2	Page No: 4.0 – 4.7
UNIT III	Chapter V	Section – 1 to 5	Page No: 5.0 – 5.19
	Chapter V	Section – 6 and 7	Page No: 5.20 – 5.28
UNIT IV	Chapter VI	Section – 1 to 7	Page No: 6.0 – 6.40
UNIT V	Chapter VII	Section – 7 to 12	Page No: 7.26 – 7.55

REFERENCE BOOKS

1. Arumugam.S, Issac,A.T (2003), *Modern Algebra*, SCITECH Publications (INDIA) PVT.LTD.

2. Johnsonbaugh (2009), *Discrete Mathematics*, 6/E, Pearson Prentice Hall.

3. Somasundaram.R.M (2006), *Discrete Mathematical Structure*, PHI Learning.

Course Code 20UITA21	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	-	M	L	H	L	-
CO2	H	L	L	L	M	-	-
CO3	H	-	M	L	L	L	-
CO4	H	L	H	L	M	-	-
CO5	H	-	H	L	L	L	-

Dr.(Mrs).A.Bharathi Lakshmi   Ms.S.Swathi Sundari

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B.Sc. INFORMATION TECHNOLOGY

(2022 - 2023 onwards)

Semester II		Hours/Week: 4	
Allied Course 2	**DISCRETE MATHEMATICS**	Credits: 4	
Course Code **20UITA21N**		Internal 25	External 75

COURSE OUTCOMES

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

CO1: recollect the elementary concepts of Groups, Combinatorics and Matrix Algebra in interdisciplinary field. [K1]

CO2: explain the mathematical concepts such as Relations, Functions, basic counting principles, algorithms and algebraic structure. [K2]

CO3: describe the notions of technical concepts in algebraic systems, Matrix Algebra, Recursion and Generating Functions. [K2]

CO4: apply the knowledge gained in Discrete Mathematics to exhibit equivalence classes, various types of functions, recurrence relations, matrix algebra and Group theory. [K3]

CO5: analyze the theory of groups, proofs and techniques of mathematical induction and generating functions. [K4]

UNIT I

Relations: Cartesian product of two Sets – Relations – Representation of relation – Operations on relations – Equivalence relations - Closures and Warshall's algorithm (Excluding Theorems) – Partitions and Equivalence classes. (10 Hours)

UNIT II

Functions and Mathematical Induction: Functions : Functions and operators - One – to – one, Onto functions - Special types of functions – Invertible functions - Composition of functions.

Mathematical Induction: Techniques of proof – Mathematical Induction.

(15 Hours)

UNIT III

Recurrence Relations and Generating Functions: Recurrence Relations: Recurrence – An introduction - Polynomials and their evaluations – Recurrence relations - Solution of finite order homogenous (Linear) relations - Solution of Non – homogenous relations.

Generating Functions: Generating functions – Some common recurrence relations.

(15 Hours)

UNIT IV

Matrix Algebra: (Sections Excluding Theorems) - Introduction - Matrix operations - The inverse of a square matrix - Elementary operations and Rank of a matrix – Simultaneous linear equations – Inverse by partitioning – Eigen values and Eigen vectors.   (10 Hours)

UNIT V

Combinatorics: Introduction- Permutation and Combinations- Pascal's Identity-Vandermonde's Identity-Permutations with Repetition-Circular Permutation-Pigeonhole Principle- Generalization of the Pigeonhole Principle- Principle of Inclusion- Exclusion- Worked Examples. (10 Hours

TEXT BOOK

1. Dr.Venkataraman.M.K, Dr. Sridharan.N, Chandrasekaran.N (2012), *Discrete Mathematics*, The National Publishing Company Basement.

2. Veerarajan T, Discrete Mathematics with Graph Theory and Combinatorics, Tata Mc-Graw Hill tenth Reprint 2010

UNIT I	Book 1 :Chapter II	Section – 1 to 7	Page No: 2.0 – 2.44
UNIT II	Book 1:Chapter III Chapter IV	Section – 1 to 5 Section – 1 to 2	Page No: 3.0 - 3.20 Page No: 4.0 – 4.7
UNIT III	Book 1:Chapter V	Section – 1 to 7	Page No: 5.0 – 5.28
UNIT IV	Book 1: Chapter VI	Section – 1 to 7	Page No: 6.0 – 6.40
UNIT V	Book 2: Chapter VI		Page No: 3.14-3.37

REFERENCE BOOKS

1. Arumugam.S, Issac,A.T (2003), *Modern Algebra*, SCITECH Publications (INDIA) PVT.LTD.

2. Johnsonbaugh (2009), *Discrete Mathematics*, 6/E, Pearson Prentice Hall.

3. Somasundaram.R.M (2006), *Discrete Mathematical Structure*, PHI Learning.

Course Code 20UITA21N	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	-	M	L	H	L	-
CO2	H	L	L	L	M	-	-
CO3	H	-	M	L	L	L	-
CO4	H	L	H	L	M	-	-
CO5	H	-	H	L	L	L	-

Dr.(Mrs).A.Bharathi Lakshmi   Ms.S.Swathi Sundari

Head of the Department   Course Designer

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B.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester II		Hours/Week: 2	
SEC 1	**OBJECT ORIENTED PROGRAMMING IN C++**	Credits: 2	
Course Code **20UITS21**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: describe the Procedural and Object Oriented Paradigm with concepts of streams, classes, functions, data and objects to acquire future technologies through the foundation skills. [K1]

CO2: articulate the principles of object-oriented problems using C++ features such as composition of objects, operator overloading, inheritance, polymorphism to apply knowledge of computing and produce effective designs and solutions for specific real time problems. [K2]

CO3: understand dynamic memory management techniques using pointers, constructors, destructors, etc., to adapt new technologies and upgrade their skill. [K2]

CO4: implement simple C++ applications using arrays, structures, pointers, concepts such as information hiding, abstraction and encapsulation and virtual functions to execute projects effectively with a focus on the future. [K3]

CO5: analyze a problem and construct a C++ program that solves the problems in the subjects like Operating System, Computer Networks and real world problems. [K4]

UNIT I

Classes and Objects: Specifying a class – Defining Member Functions – Making an outside Function Inline – Nesting of Member Functions – Private Member Functions – Array with in a Class – Memory Allocation for Object - Static Data Members – Static Member Functions - Arrays of Objects – Object as Function Arguments – Friendly Functions –Returning Objects. (5 Hours)

UNIT II

Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructor – Destructors.

Operator Overloading and Type Conversions: Defining Operator Overloading - Overloading Unary Operators - Overloading Binary Operators – Rules for Overloading Operators - Type Conversion.   (6 Hours)

UNIT III

Inheritance: Extending Classes: Defining Derived Classes – Single Inheritance – making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance.   (6 Hours)

UNIT VI

Working with Files: Classes for File Stream Operations – Opening and Closing a File – Detecting End-Of-File – More about open():File Modes – File Pointers and their Manipulation – Sequential Input and Output Operations – Command Line Arguments. (6 Hours)

UNIT V

Templates: Introduction- Class Templates – Function Templates –Member Function Templates.

Exception Handling: Basics of Exception handling – Exception Handling Mechanism – Throwing Mechanism – Catching Mechanism.   (7 Hours)

TEXT BOOK

Balagurusamy.E (2013), *Object-oriented programming with C++*, 7th edition, Tata McGraw Hill Publication.

UNIT	CHAPTERS	SECTIONS
I	5	5.3, 5.4, 5.6 - 5.16
II	6, 7	6.2 - 6.7, 6.11, 7.2 - 7.4, 7.8, 7.9
III	8	8.2 - 8.7
IV	11	11.2 – 11.7, 11.10
V	12, 13	12.1, 12.2, 12.4, 12.7, 13.2 – 13.5

REFERENCE BOOKS

1. Herbert Schildt (1998), *C++ the Complete Reference*, Tata McGraw Hill Publication.

2. Ravichandran.D (2007), *Programming With C++*, Tata McGraw Hill Publication.

3. Graham M. Seed (1996), *An Introduction to Object-Oriented Programming in C++with Applications in Computer Graphics*, Springer.

Course Code 20UITS21	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	H	M	L	M	L	M	L	M	-	-
CO2	H	H	L	H	M	M	M	L	-	-
CO3	M	M	M	M	H	H	M	L	-	-
CO4	M	L	H	H	H	H	H	M	-	-
CO5	M	H	M	H	H	H	M	H	-	-

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B.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 Onwards)

Semester II		Hours/Week: 2	
SEC Practical 2	**OBJECT ORIENTED PROGRAMMING USING C++ LAB**	Credits: 2	
Course Code **20UITS21P**		Internal 40	External 60

COURSE OUTCOMES

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

   CO1: figure out the solutions for a range of problems. [K3]

   CO2: apply object oriented programming concepts in C++ using objects and classes to attain professional excellence. [K3]

   CO3: implement algorithmic problems including inheritance and polymorphism for specific real time problems. [K3]

   CO4: examine the applications to be implemented for stream, file I/O and C++ concepts to solve problems in the areas of Information Technology for sustainable environment. [K3]

   CO5: analyse the object oriented programs using templates and exceptional handling concepts. [K4]

Lab Exercises
Write programs in C++ for the following

1. To check if a number is prime or not, using objects

2. To calculate simple interest using function using rate of interest as default argument.

3. To perform Area calculation using Function overloading (Minimum three functions).

4. To swap two values between two class objects using friend function.

5. To find the sum of the digits of a given number using parameterized constructor.

6. To display student's information using array of objects.

7. To overload Binary plus operator to add two complex numbers.

8. To prepare a student's mark list using single inheritance.

9. To prepare pay slip of an employee using multilevel inheritance.

10. To create bank account using multiple inheritance.

11. To prepare EB bill for a customer using hybrid inheritance

12. To implement file operations.

13. To perform arithmetic operations using class templates

14. To implement exception handling.

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	H	H	H	H	H	H	H	H	M	-
CO2	H	H	H	H	H	H	H	H	M	-
CO3	M	M	H	H	H	H	H	H	H	-
CO4	M	M	H	H	M	H	M	H	M	-
CO5	L	L	M	H	M	H	M	M	M	-

Dr.(Mrs).A.Bharathi Lakshmi   Mrs.S.Rajapriya

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B.Sc. INFORMATION TECHNOLOGY
(2020 -2021 onwards)

Semester III		Hours/Week: 4	
Core Course 3	**DATABASE MANAGEMENT SYSTEMS**	Credits: 4	
Course Code		Internal	External
20UITC31		25	75

COURSE OUTCOMES

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

CO1: learn the fundamental elements of DBMS to enhance their knowledge. [K1]

CO2: understand the architecture of database and the languages used to maintain DBMS to apply the software aspects of computer systems. [K2]

CO3: experiment database requirements and determine the entities involved in the system and their relationship to one another to find solutions for specific domain problems. [K3]

CO4: differentiate a relational database using a relational database package and Manipulate a database using SQL for applying current technical concepts and practices. [K4]

CO5: assess the quality and ease of use of data modelling and diagramming tools in real world based on their carrier. [K5]

UNIT I

Introduction: Database System Applications -Purpose of Data Base Systems-View of Data-Database Languages-Relational Databases-Database Design-Data storage and querying – Transaction Management-Database Architecture.

Database Design and the E-R Model: Overview of the Design Process- The Entity-Relationship Model- Constraints – Removing Redundant Attributes in Entity Sets – Entity Relationship Diagrams – Reduction to Relational Schema -Entity-Relationship Design Issues.

(12 Hours)

UNIT II

Introduction to the Relational Model: Structure of Relational Databases–Database Schema – Keys – Schema Diagrams – Relational Query Languages –Relational Operations.

Relational Database Design: Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies- Functional Dependency Theory. (10 Hours) **UNIT III**

Introduction to SQL: Overview of the SQL Query Language – SQL Data Definition – Basic structure of SQL queries – Additional basic Operations – Set Operations - NULL values –Aggregate functions – Nested Subqueries– Modification of the database. (14 Hours)

UNIT IV

Transactions: Transaction Concept – A Simple Transaction Model-Storage Structure-Transaction Atomicity and Durability – Transaction Isolation – Serializability.

Concurrency Control: Lock based Protocols –Deadlock Handling – Multiple Granularity - Timestamp Based Protocols – Validation Based Protocol. (10 Hours) **UNIT V**

Recovery System: Failure Classification- Storage -Recovery and Atomicity-Recovery Algorithm –Buffer Management.

Distributed Databases: Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transactions –Commit Protocols –Concurrency Control in Distributed Databases. (14 Hours)

TEXT BOOK

Abraham Silberschatz, Henry F. KorthS.Sudarshan (2013). *Database System Concepts*, Tata McGraw Hill International Edition. 6th Edition.

UNIT	CHAPTER	SECTIONS
I	1	1.1-1.9
	7	7.1-7.7
II	2	2.1-2.6
	8	8.1-8.4
III	3	3.1-3.9
IV	14	14.1-14.6
	15	15.1-15.5
V	16	16.1–16.5
	19	19.1 – 19.5

REFERENCE BOOKS

1. Alexis Leon, Mathews Leon (2006). *Essentials of Database Management Systems,* Vijay Nicole Imprints Pvt. Ltd.

2. Date, C.J. (2002). *An Introduction to Database Systems,* 7th Edition. Pearson Education Pvt. Ltd.

3. Raghu Ramakrishnan and Johannes Gehrke, *Database Management Systems,* 2nd Edition. Tata McGraw- Hill.

Course Code 20UITC31	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	H	M	L	H	M	L	M	H	H	L
CO2	H	H	L	M	M	L	H	M	L	L
CO3	H	H	L	L	H	M	H	H	H	L
CO4	H	H	M	H	H	M	M	H	M	L
CO5	H	H	L	H	H	M	H	M	M	L

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VIRUDHUNAGAR – 626 001

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

Semester III	**DATABASE MANAGEMENT SYSTEMS**	Hours/Week: 4	
Core Course 3		Credits: 4	
Course Code		Internal	External
20UITC31N		25	75

COURSE OUTCOMES

CO1: learn the fundamental elements of DBMS to enhance their knowledge. [K1]

CO2: understand the architecture of the database and the languages used to maintain DBMS to apply the software aspects of computer systems. [K2]

CO3: experiment database requirements and determine the entities involved in the system and their relationship to one another to find solutions for specific domain problems. [K3]

CO4: differentiate a relational database using a relational database package and manipulate a database using SQL for applying current technical concepts and practices. [K4]

CO5: assess the quality and ease of use of data modeling and diagramming tools in real world based on their carrier. [K5]

UNIT I

Introduction: Database System Applications - Purpose of Database Systems -View of Data-Database Languages - Relational Databases-Database Design-Data storage and querying – Transaction Management - Database Architecture.

Database Design and the E-R Model: Overview of the Design Process- The Entity-Relationship Model- Constraints – Entity Relationship Diagrams.   (12 Hours)

UNIT II

Introduction to the Relational Model: Structure of Relational Databases–Database Schema – Keys – Schema Diagrams – Relational Query Languages – Relational Operations.

Relational Database Design: Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies- Functional Dependency Theory.   (10 Hours)

UNIT III

Introduction to SQL: Overview of the SQL Query Language – SQL Data Definition – Basic Structure of SQL queries – Additional basic Operations – Set Operations - NULL values – Aggregate functions – Nested Subqueries– Modification of the database.   (14 Hours)

UNIT IV

Intermediate SQL: Join Expressions – Views – Transactions – Integrity Constraints.

Advanced SQL: Functions and Procedures - Triggers   (10 Hours)

UNIT V

Transactions: Transaction Concept – A Simple Transaction Model-Storage Structure-Transaction Atomicity and Durability – Transaction Isolation – Serializability.

Concurrency Control: Lock based Protocols –Deadlock Handling – Timestamp Based Protocols – Validation Based Protocol.   (14 Hours)

TEXT BOOK

Abraham Silberschatz, Henry F. KorthS.Sudarshan (2013). *Database System Concepts*, Tata McGraw Hill International Edition. 6th Edition.

UNIT	CHAPTER	SECTIONS
I	1	1.1-1.9
	7	7.1,7.2,7.3,7.5
II	2	2.1-2.6
	8	8.1-8.4(8.4.1,8.4.2)
III	3	3.1-3.9
IV	4	4.1-4.4
	5	5.2,5.3
V	14	14.1-14.6
	15	15.1,15.2,15.4,15.5

REFERENCE BOOKS

1. Alexis Leon, Mathews Leon (2006). *Essentials of Database Management Systems,* Vijay Nicole Imprints Pvt. Ltd.

2. Date, C.J. (2002). *An Introduction to Database Systems,* 7th Edition. Pearson Education Pvt. Ltd.

3. Raghu Ramakrishnan and Johannes Gehrke, *Database Management Systems,* 2ⁿᵈ Edition. Tata McGraw- Hill.

	PO1		PO2		PO3	PO4	PO5		PO6	PO7
Course Code (**20UITC31N**)	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	H	M	L	H	M	L	M	H	H	L
CO 2	H	H	L	M	M	L	H	M	L	L
CO 3	H	H	L	L	H	M	H	H	H	L
CO 4	H	H	M	H	H	M	M	H	M	L
CO 5	H	H	L	H	H	M	H	M	M	L

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Head of the Department   **Course Designer**

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B.Sc. INFORMATION TECHNOLOGY
(2020 -2021 onwards)

Semester III		Hours/Week: 4	
Core Course 4	**OPERATING SYSTEMS**	Credits: 3	
Course Code		Internal	External
20UITC32		25	75

COURSE OUTCOMES

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

CO1: reminisce the structure of operating system, files, services and techniques used for scheduling CPU helps in synchronizing the process and memory. [K1]

CO2: illustrate the components of a system, main principles and techniques used to implement processes and deadlock as well as the different algorithms for process scheduling and paging of memory to solve the technical memory management errors. [K2]

CO3: identify the main problems related to scheduling and the different process synchronization and also deadlock mechanisms, as well as describe the different approaches of memory management and paging replacement algorithms to resolve page faults. [K3]

CO4: explain the structure and organization of file system, Apply the knowledge of process management, synchronization, deadlock to solve basic problems in allocating memory and resource. [K4]

CO5: evaluate the basic system design process and how to schedule the process and CPU as well as the requirement for process coordination and avoid the deadlock to enhance the system capacitance. [K5]

UNIT I

Introduction: Operating System – Mainframe Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems.

Operating System Structures: System components – Operating System Services– System calls – System programs. (10 Hours)

UNIT II

Processes: Process concepts - Process scheduling – Operations on Process-Cooperating Process- Inter Process communication.

CPU scheduling: Basic Concepts – Scheduling criteria – scheduling algorithms – First-Come First-Served Scheduling – Shortest Job First Scheduling – Priority Scheduling – Round-Robin Scheduling. (15 Hours)

UNIT III

Process Synchronization: The Critical-section problem – Semaphores – Classic problems of synchronization.

Deadlocks: Deadlock characterization – Deadlock prevention – Deadlock Avoidance – Deadlock Detection. (15 Hours)

UNIT IV

Memory Management: Contiguous memory allocation – Paging: Basic Methods – segmentation.

Virtual Memory: Demand paging: Basic concepts - Page replacement. (10 Hours)

UNIT V

File-System Implementation: Directory implementation – Allocation methods: Contiguous Allocation – Linked Allocation – Indexed Allocation.

Mass-Storage Structure: Disk Structure – Disk Scheduling – Disk Management.

(10 Hours)

TEXT BOOK

Silberschartz, A. Galvin, Gagne, John Wiley & Sons, (2007). *Operating System Concepts,* 6th Edition.

UNIT	CHAPTERS	SECTIONS
I	1, 3	1.1,1.2,1.4 – 1.7, 3.1 – 3.4
II	4, 6	4.1 – 4.5, 6.1 – 6.3.1, 6.3.2, 6.3.3, 6.3.4
III	7, 8	7.2, 7.4, 7.5, 8.2, 8.4 – 8.6
IV	9, 10	9.3, 9.4.1, 9.5, 10.2.1, 10.4
V	12, 14	12.3 - 12.4.1, 12.4.2, 12.4.3,14.1 -14.3

REFERENCE BOOKS

1. William Stallings, (2009). *Operating Systems: Internals and Design Principles*, 6th Edition.Dorling Kindersley India Pvt. Ltd.

2. Davis, *Operating Systems,* 6th Edition.Pearson Education.

3. Dhamdhere, D.M. *Operating Systems: A Concept–Based Approach,* 2nd Edition. The McGraw-Hill Companies.

Course Code 20UITC32	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	H	M	H	H	L	L	H	M	H	L
CO2	H	L	H	H	H	M	M	H	M	L
CO3	H	M	M	L	M	M	M	H	H	L
CO4	H	M	H	M	H	L	M	H	M	L
CO5	M	L	H	M	H	M	H	M	M	L

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Head of the Department   Course Designer

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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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
(2020 -2021onwards)

Semester III		Hours/Week: 4	
Core Practical 3	**RDBMS LAB**	Credits: 2	
Course Code		Internal	External
20UITC31P		40	60

COURSE OUTCOMES

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

CO1: Illustrate the transaction processing system to acquire the knowledge of database concepts. [K3]

CO2: determine the DDL, DML and DCL commands and relational database schemas to develop the PL/SQL programs to solve the real time (online) transaction processing system. [K3]

CO3: demonstrate a basic programmatic interface to a database and to use the basic functions of one such interface to enhance their skills to find the solutions for real time problems. [K3]

CO4: practice and record the commands and database packages that are used to create, populate, maintain, and query a database to deliver a data report in easily understandable format. [K3]

CO5: discover the query using SQL, solutions to a broad range of query, data update problems and derive an information model expressed in the forms to enhance their lifelong learning. [K4]

Lab Exercises

Write simple Queries for the following:

1.   Implement DML commands

2.   To Implement DDL commands

3.   To Implement DCL commands

4.   To Implement Aggregate functions

Write PL/SQL for the following:

5.   Programs using conditional control, iterative controls and sequential controls

6.   Programs using exception handling.

7.   Programs using explicit cursors and implicit cursors.

8.   Programs using database triggers.

9.   Programs to design procedures using in, out parameter.

10.   Program to design procedures using functions.

11.   Programs to design procedures using packages.

FORMS AND REPORT WRITER

12.   Inventory Control

13.   Banking

14.   Student mark List

15.   Library maintenance

16.   Payroll

17.   Invoice

18.   Railway Reservation

19.   College Admission

Course Code 20UITC31P	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	H	M	H	H	H	H	M	H	L	L
CO2	H	H	H	H	H	H	H	M	L	L
CO3	M	M	H	H	H	H	H	M	M	L
CO4	M	M	H	M	M	H	M	L	H	L
CO5	L	M	H	H	M	H	L	M	M	L

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 -21 onwards)

Semester III		Hours/Week: 4	
Allied Course 3	**NUMERICAL METHODS**	Credits: 4	
Course Code		Internal	External
20UITA31		25	75

COURSE OUTCOMES

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

CO1: recollect the fundamental concepts and principles of numerical approximations for technological development. [K1]

CO2: discuss the notion of several approximation and interpolation methods in interdisciplinary fields. [K2]

CO3: understand the appropriate numerical methods for solving various types of problems by adapting the knowledge of technology. [K2]

CO4: apply the knowledge gained in various methods to find the solutions, missing values, derivatives and integrals of given data in real life situations. [K3]

CO5: analyze complex mathematical problems in technological development using appropriate numerical methods. [K4]

UNIT I

Algebraic and Transcendental Equations: Introduction – Errors in Numerical Computation – Iteration Method (Successive Approximation Method) – Bisection Method (Bolzano method) – Regula Falsi Method (Method of False Position) – Newton-Raphson Method.

(12 Hours)

UNIT II

Simultaneous Equations: Introduction– Simultaneous Equations – Back Substitution – Gauss Elimination Method – Gauss-Jordan Elimination Method – Gauss-Seidal Iteration method.

(12 Hours)

UNIT III

Interpolation: Introduction – Newton's Interpolation Formulae – Central Difference Interpolation Formulae – Lagrange's Interpolation formula – Inverse Interpolation. (12 Hours)

UNIT IV

Numerical Differentiation and Integration: Introduction – Derivatives using Newton's Forward Difference Formula – Derivatives using Newton's Backward Difference Formula – Numerical Integration–Newton's Cote's Quadrature Formula – Trapezoidal Rule – Simpson's One Third Rule – Simpson's Three Eight Rule. (12 Hours)

UNIT V

Numerical Solutions of Ordinary Differential Equations: Introduction – Taylor's Series Method – Picard's Method – Euler's Method – Runge-Kutta Methods (2nd and 4th Order Only)

(12 Hours)

TEXT BOOK

Arumugam, S., Thangapandi, A., Isaac & Somasundaram, A. *Numerical Methods, T*he Scitech Publications (India) pvt. Ltd., Chennai, 2nd Edition.

UNIT	CHAPTERS	SECTIONS	PAGE NO.
I	3	3.0 – 3.4	79 – 106
II	4	4.0 – 4.4, 4.8	112 – 123, 139 - 145
III	7	7.0 – 7.3, 7.6	202 –245, 255 - 259
IV	8	8.0 – 8.2, 8.5	260 , 261, 279 -285
V	10	10.0 – 10.4	325 – 352

Course Code 20UITA31	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H	L	H	M	H	L	-
CO2	H	L	H	L	H	-	-
CO3	H	L	H	M	M	L	L
CO4	H	-	H	M	H	-	-
CO5	H	-	H	L	H	-	-

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester IV		Hours/Week: 4	
Core Course 5	**PHP and MYSQL**	Credits: 4	
Course Code		Internal	External
20UITC41		25	75

COURSE OUTCOMES

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

CO1: demonstrate server-side, client-side scripting techniques, variables, branching, HTTP , arrays and the purpose of a database able to apply particular scripting techniques as per the requirements of users**.** [K1]

CO2: complete the dynamic web pages using basic functions of PHP, types in PHP, functions and variable scope, multidimensional arrays and supported databases technologies through designing the real-time applications. [K2]

CO3: outline the PHP programming concepts in deciding on a web application platform,, control structures and functions, string handling functions for developing web applications. [K3]

CO4: summarize about server-side scripting, control structures and functions, PHP number handling, passing information with PHP, Structured Query Language connectivity using PHP programs. [K4]

CO5: measure the advantages of server-side Scripting, alternate control syntaxes, PHP super global arrays, inspecting arrays, privileges and security for developing various database tasks in Web applications through PHP programs. [K5]

UNIT I

PHP and MySQL: PHP –MySQL – Deciding on a Web Application Platform.

Server-Side Scripting Overview: Static HTML – Client-Side Technologies – Server-Side Scripting –Advantages of Server-Side Scripting.

Learning PHP Syntax and Variables: PHP is Forgiving – HTML is not PHP – PHP's Syntax is C – Like – Comments – Variables – Types in PHP – Type Summary – The Simple Types – Output.

(15 Hours)

UNIT II

Learning PHP Control Structures and Functions: Boolean Expressions– Branching– Looping – Alternate Control Syntaxes – Terminating Execution – Using Functions – Function Documentation – Defining own Functions – Functions and Variable Scope – Function, Scope. (10 Hours)

UNIT III

Passing Information with PHP: HTTP is Stateless – GET Arguments – A Better use for GET – Style URL's – POST Arguments – Formatting form Variables – PHP Super Global Arrays.

Learning PHP String Handling: Strings in PHP – String Functions. (12 Hours)

UNIT IV

Learning Arrays: The uses of Srrays –PHP Arrays – Creating Arrays – Retrieving Values – Multidimensional Arrays – Inspecting Arrays – Deleting from Arrays – Iteration.

Learning PHP Number Handling: Numerical Types – Mathematical Operators – Simple Mathematical Functions – Randomness. (13 Hours)

UNIT V

Introducing Databases and MySQL: Database – Purpose of a Database – PHP Supported Databases – Focus:MySQL.

Learning Structured Query Language (SQL): Relational Databases and SQL – SQL Standards – The Workhorses of SQL – Database Design – Privileges and Security.

(10 Hours)

TEXT BOOK

Steve Suehring, Tim Converse, and Joyce Park,*PHP6 and MySQL Bible,* Wiley, INDIA.

UNIT	CHAPTER
I	1, 2, 4
II	5
III	6, 7
IV	8, 9
V	11, 13

REFERENCE BOOKS

1. Luke Welling,Laura Thomson,*PHP MySQL Web Development*, Pearson, 5[th]Edition.

2. VikramVaswani,*How to Do everything with PHP and MySQL,* McGraw-Hill/Osborne.

3. Alan Forbes, (2015). *The Joy of PHP: A Beginner's Guide to programming Interactive Web Applications with PHP & MySQL,* Create Space Independent Publishing Platform.

Course Code 20UITC41	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	H	L	M	M	M	H	H	M	L	L
CO2	H	M	M	M	M	H	M	H	L	L
CO3	H	M	M	M	H	H	M	H	L	L
CO4	H	M	M	H	H	H	H	M	L	L
CO5	M	M	H	M	H	H	H	M	L	L

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VIRUDHUNAGAR - 626 001

B.Sc. INFORMATION TECHNOLOGY
(2022 – 23 onwards)

Semester IV		Hours/Week: 4	
Core Course – 5	**JAVA PROGRAMMING**	Credits: 4	
Course Code		Internal	External
22UITC41		25	75

COURSE OUTCOMES

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

CO1: recall the Java Programming Concepts, creating an array, threads and defining an interface for gaining strong foundation on Java Programming to upgrade their skills and adapt to new technologies. [K1]

CO2: outline the benefits of Java tokens, symbolic constants, evaluation of expressions, the switch statement, constructors, vectors, implementing interfaces creating packages, threads and exceptions, an applet for designing the real-time web applications to acquire imminent technologies through the foundation skills. [K2]

CO3: develop java programming implementing operator precedence, conditional operators, inheritance, interfaces, package, synchronization, user defined exceptions and applet for developing web pages to execute projects efficiently. [K3]

CO4: analyze overriding methods, type casting, wrapper classes, and java API packages, thread priority, building applet code and graphics in Java programs to transform innovative ideas into real time projects. [K4]

CO5 : measure type conversions in expressions, finalizer methods, and system packages, thread exception, passing parameters to applets and graphics programming to implement a secure and reliable file communication system. [K5]

UNIT I

Java Evolution: Java History – Java Features – How Java differs from C and C++ – Java and Internet – Java and World Wide Web. **Overview of Java Language:** Introduction – Simple Java Program – More of Java – An Application with two classes – Java Program

Structure – Java Tokens – Java Statements – Java Virtual Machine – Command Line Arguments. **Constants, Variables and Data Types:** Introduction – Constants – Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants – Type Casting – Getting Values of Variables – Standard Default values. **Operators and Expression:** Introduction – Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical Functions. (15 Hours)

UNIT II

Decision Making and Branching: Introduction – Decision Making with If Statement – Simple If Statement – The if ….. Else Statement – Nesting of If … Else Statements – The Else If Ladder – The Switch Statement – The ? : Operator.**Decision Making and Looping:** Introduction – While Statement – do Statement – for statement – Jumps in Loops – Labeled Loops. **Classes, Objects and Methods:** Introduction – Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Method Overloading – Static Members – Nesting of methods – Inheritance: Extending a class – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Methods with Var args – Visibility Control.

Self Study: Simple If – The if ….. Else Statement – Nesting of If … Else Statement – The Else If Ladder. (12 Hours)

UNIT III

Arrays Strings and Vectors: Introduction – One-Dimensional Arrays – Creating an Array – Two-Dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types. **Interfaces: Multiple Inheritance:** Introduction – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables. **Packages: Putting Classes Together:** Introduction – Java API Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import. (17 Hours)

UNIT IV

Multithreaded Programming: Introduction – Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Method – Thread Exception – Thread Priority – Synchronization – Implementing the 'Runnable' Interface. **Managing Errors and Exceptions:** Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions – Using Exceptions for Debugging.

(16 Hours)

UNIT V

Applet Programming: Introduction – How Applet Differ from Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML file – Running the Applet – More About Applet Tag – Passing Parameters to Applets – Aligning the Display – More About HTML Tags – Displaying Numerical Values – Getting Input from the User. **Graphics Programming:** Introduction – The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts   (15 Hours)

TEXT BOOK

Balagurusamy, E. (2015). *Programming with Java : A Primer*, Fifth Edition, New Delhi : Tata McGraw-Hill Education.

UNIT	CHAPTERS	SECTIONS
I	2 - 6	2.1-2.5, 3.1-3.7, 3.10, 3.11, 4.1- 4.11, 5.1-5.15, 6.1-6.8
II	7 - 8	7.1-7.6, 8.1-8.18
III	9, 10, 11	9.1–9.8, 10.1–10.5, 11.1-11.10
IV	12, 13	12.1-12.10, 13.1-13.7, 13.9
V	14, 15	14.1-14.16, 15.1-15.9

REFERENCE BOOKS

1. Daniel Liang, Y. (2011). *Introduction to Java Programming*, Eighth Edition, Delhi : Pearson Higher Education.

2. Patrick Naughton, Herbert Schildt, (2002). *Java 2 – The Complete Reference*, Fifth Edition, New Delhi: Tata McGraw Hill.

3. Dr.Somasundaram, (2013). *Introduction to Java Programming*, India: Jaico Publishing House.

Course Code (**22UITC41**)	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	H	L	M	M	M	H	H	M	L	L
CO 2	H	M	M	M	M	H	M	H	L	L
CO 3	H	M	M	M	H	H	M	H	L	L
CO 4	H	M	M	H	H	H	H	M	L	L
CO 5	M	M	H	M	H	H	H	M	L	L

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020-2021 onwards)

Semester IV		Hours/Week: 4	
Core Practical 4		Credits: 2	
Course Code	**WEB DESIGN USING PHP LAB**	Internal	External
20UITC41P			60

COURSE OUTCOMES

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

CO1: demonstrate the client side and server-side scripting techniques and able to apply particular scripting technique as per the requirements of users**.** [K3]

CO2: complete the dynamic web pages using server-side scripting and the basic function of PHP as well as uses of open sources technologies through designing the real-time applications. [K3]

CO3: outline the PHP programming concepts and looping to develop web applications using meta characters, images, frames and regular expressions including modifiers. [K4]

CO4: summarize about the database handling and connectivity using MySQL and Create PHP programs that use various PHP library functions, and that manipulate files and directories. [K5]

CO5: develop various database tasks in Web applications through PHP programs and Build an application to construct various queries in MYSQL and implement the connectivity to the database. [K6]

Lab Exercises

Write a PHP Programme to

1. Design a Resume using form

2. Design a Mark statement using table

3. Count the occurrence of a number with its position using while loop.

4. Perform number manipulation using switch-case.

5. Calculate simple interest using function.

6. Generate Fibonacci series using recursive function.

7. Calculate NCR, using include command to include the factorial function.

8. Perform string manipulations.

9. Demonstrate all array operations.

10. Perform various Mathematical operations

11. Create a database for bank transaction using MYSQL connectivity.

12. Perform student mark list processing using MYSQL connectivity.

13. Design Employee pay bill form in HTML & process using MYSQL connectivity.

14. Create library details using MYSQL connectivity

15. Create Inventory details using MYSQL connectivity

Course Code 20UITC41P	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	H	H	H	H	H	H	H	M	M	L
CO2	H	H	H	H	H	H	M	H	M	L
CO3	H	M	H	M	H	H	M	H	H	L
CO4	M	M	H	H	M	H	M	H	H	L
CO5	L	M	H	H	L	M	L	M	H	L

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B.Sc. INFORMATION TECHNOLOGY
(2022-23 onwards)

Semester VI		Hours/Week: 4	
Core Practical – 4	**JAVA PROGRAMMING LAB**	Credits: 2	
Course Code		Internal	External
22UITC41P		40	60

COURSE OUTCOMES

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

CO1:   attain the concepts of classes and objects to enhance their oops concepts skills. [K3]

CO2:   improves code readability, reusability by the concepts of function overloading and inheritance to solve various problems in IT effectively and professionally. [K3]

CO3:   apply multithreading for Program responsiveness, Utilization of Multiprocessor Architecture to solve various computing problems. [K3]

CO4:   implement data encapsulation and provide controlled access with packages and provide functionality to import resources such as images, GUI controls, audio clips based on URLs by applets. [K4]

CO5:   measures the basic applications, GUI application, web applications handling runtime errors using Exception to transform innovative ideas into real time projects. [K4]

Using Class and Object concept

1.   Write a Java program to find

i)   Largest number

ii)   Small numbr

2.   Write a Java program to find sum of digits

Using Function Overloading and Constructors

3.   Write a Java program to find the volume of different shapes.

Using Decision making and branching

4.   Write a Java program to check whether the given number is prime, perfect, adam, armstrong.

Using Array Concepts

5.   Write a Java program for Matrix Manipulation

6.   Write a Java program to sort the names in alphabetical order

Using Inheritance

7.   Write a Java program for student details

8.   Write a Java program for Employee details

9.   Write a Java program to Implement multiple inheritance using interface for payroll

processing

Using Multithreading

10.   Write a Java program to perform multiplication table and sum of digit.

11.   Write a Java program to check whether the number is odd or even

Using Exception

12.   Write a Java program to perform Any 3 Built in Exception

13.   Write a Java program to implement User defined Exception

Using Package

14.   Write a Java program to perform Arithmetic operation.

Using Applet

15.   Write a Java program to Animate a Face

16.   Write a Java program to design a Traffic signal

Using AWT/Event Handling

17.   Write a Java program to find volume of different shapes.

Course Code 22UITC41P	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	H	H	H	H	H	H	H	M	M	L
CO2	H	H	H	H	H	H	M	H	M	L
CO3	H	M	H	M	H	H	M	H	H	L
CO4	M	M	H	H	M	H	M	H	H	L
CO5	L	M	H	H	L	M	L	M	H	L

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020-2021 onwards)

Semester IV	DATA ANALYTICS	Hours/Week: 4	
Allied Course - 4		Credits: 4	
Course Code		Internal	External
20UITA41		25	75

COURSE OUTCOME

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

CO1: learn to build reports, interactive dashboards and story interfaces to enhance their knowledge**.** [K1]

CO2: comprehend the data analysis techniques to gather, describe, and analyze data, and use advanced statistical tools to make decisions on operations. [K2]

CO3: infer the charts, graphs, and tools used for analytical problems in real-world scenarios. [K2]

CO4: experiment and evaluate the modeling data to help make more effective business analytics and business industry for specific domain problems. [K3]

CO5: discriminate different methodologies in data analytics to find solutions for predictive analytics in real world based on their carrier. [K4]

UNIT I

> **Introduction:** Data Analysis. **A Single Variable: Shape and Distribution** - Dot and Jitter Plots - Histograms and Kernel Density Estimates - The Cumulative Distribution Function- Rank-Order Plots and Lift Charts - Summary Statistics and Box Plots – NumPy. (12 Hours)

UNIT II

> **Two Variables: Establishing Relationships:** Scatter Plots - Conquering

Noise: Smoothing - Logarithmic Plots – Banking - Linear Regression.

> **Graphical Multivariate Analysis:** False-Color Plots – Multiplots - Composition Problems - Novel Plot Types - Tools for Multivariate Graphics.

> (12 Hours)

UNIT III

Analytics: Modeling Data: Guesstimation and the Back of the Envelope: Principles of Guesstimation - A Closer Look at Perturbation Theory and Error Propagation - The Gnu Scientific Library.

Models from Scaling Arguments: Models - Arguments from Scale - Mean-Field Approximations - Common Time-Evolution Scenarios.   (12 Hours)

UNIT IV

Reporting, Business Intelligence, and Dashboards: Data Quality Issues - Berkeley DB and SQLite.

Financial Calculations and Modeling: The Time Value of Money - Uncertainty in Planning and Opportunity Costs - Cost Concepts and Depreciation - The Newsvendor Problem.

(12 Hours)

UNIT V

Predictive Analytics: Introduction - Some Classification Terminology - Algorithms for Classification - The Process - The Secret Sauce - The Nature of Statistical Learning - Two Do-It-Yourself Classifiers.   (12 Hours)

TEXT BOOK

Philipp K. Janert, *Data Analysis with Open Source Tools,* United States of America: O'Reilly Media Publishers.

UNIT	CHAPTERS	PAGE NO.
I	2	1,12-45
II	3,5	47-66, 100-120, 123-125
III	7,8	142-148,155-162 163-182
IV	16,17	373-382, 384-398, 400-403
V	18	405-433

REFERENCE BOOKS

1. Johannes Ledolter, (2013), *Data Mining and Business Analytics with R,* Wiley.

2. Michael Berthold, David J. Hand, (2007), *Intelligent Data Analysis,* Springer.

3. Croll and B. Yoskovitz, *Lean Analytics: Use Data to Build a Better Startup Faster*, O'Reilly Media Publishers.

Course Code 20UITA41	PO1	PO2	PO3	PO 4	PO5	PO6	PO7
CO1	H	H	L	H	H	H	L
CO2	H	H	H	H	H	M	-
CO3	M	L	M	H	H	H	L
CO4	M	M	H	H	H	M	-
CO5	M	H	H	H	H	M	L

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY
(2022-2023 onwards)

Semester IV		Hours/Week: 4	
Allied Course - 4	**DATA ANALYTICS WITH DATA SCIENCE**	Credits: 4	
Course Code		Internal	External
22UITA41		25	75

COURSE OUTCOME

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

CO1: learn to build reports, interactive dashboards and story interfaces to enhance their knowledge**.** [K1]

CO2: comprehend the data analysis techniques to gather, describe, and analyze data, and use advanced statistical tools to make decisions on operations. [K2]

CO3: infer the charts, graphs, and tools used for analytical problems in real-world scenarios. [K2]

CO4: experiment and evaluate the modeling data to help make more effective business analytics and business industry for specific domain problems. [K3]

CO5: discriminate different methodologies in data analytics to find solutions for predictive analytics in real world based on their carrier. [K4]

UNIT I

. Ways of Thinking About Data: Data is - Qualitative Data - Quantitative Data - Data Strategies . Conceptualizing Data Analysis as a Process: The "Problem" with Data Analysis - Data Analysis as a Linear Process - Data Analysis as a Cycle. Managing the Data Analysis Process: Developing a Team - Planning - Data Management - Writing – Evaluation. (12 Hours)

UNIT II

Data Analysis Using Content Area Examples: Introduction to Data Analysis - Terms and Concepts - Data Procedures and Methods - Procedures for Quantitative Analysis - Methods for Qualitative Analysis - Content Area Examples Using Different Procedures and Methods – Health - Teacher Credentials - Classroom Quality – Disabilities - Estimating the Number of Eligible Migrant

and Seasonal Head Start Children and Families - Infant Toddler Languages: Program Policies - Family Strengths and Needs. (12 Hours)

UNIT III

Introduction to Data Science: Basics of Data Analytics – Need of Data Analytics – What is Data Analytics? – Overview of Data Analytics Lifecycle – Importance of Data Analytics for Business – Types of Data Analytics – Descriptive Analytics – Predictive Analytics – Prescriptive Analytics – Statistical Interference – Population of Samples – Statistical Modeling – Probability Distribution – Correlation – Regression. (12 Hours)

UNIT IV

Introduction to Machine Learning: Basics of Machine Learning – Supervised Machine Learning – k-Nearest Neighbors(KNN) – Naïve Bayes – Decision Tree – Support Vector Machines - Unsupervised Machine Learning – Cluster Analysis – K Means – Association Rule Mining – Regression Analysis – Linear Regression – NonLinear Regression.

(12 Hours)

UNIT V

Data Visualization: Basic Principles – Idea and Tools for Data Visualization – Graph Visualization – Data Summaries – Model Checking and Comparison – Purpose of Visualization – Multi-dimensional Visualization – Tree Visualization – Visualization Techniques – Understanding Analytics Output and their Usage – MatplotLib Library – plotting – Subplotting – Image Processing. (12 Hours)

TEXT BOOK
1. *Introduction to Data Analysis Handbook,* Migrant & Seasonal Head Start Technical Assistance Center.
2. *Data Analytics*, Mrs-Veena-Gandhi-Dr-Ms-Manisha-Bharambe, Nirali Prakashan Publishers.

UNIT	Books	CHAPTERS	Section
I	1	2,3,4	5 – 26
II	1	5	27 – 83
III	2	1	1.2-1.4
IV	2	2	2.1 – 2.4
V	2	4	4.1, 4.3

REFERENCE BOOKS

1. Johannes Ledolter, (2013), *Data Mining and Business Analytics with R,* Wiley.

2. Michael Berthold, David J. Hand, (2007), *Intelligent Data Analysis,* Springer.

3. Croll and B. Yoskovitz, *Lean Analytics: Use Data to Build a Better Startup Faster*, O'Reilly Media Publishers.

Course Code 22UITA41	PO1	PO2	PO3	PO 4	PO5	PO6	PO7
CO1	H	H	L	H	H	H	L
CO2	H	H	H	H	H	M	-
CO3	M	L	M	H	H	H	L
CO4	M	M	H	H	H	M	-
CO5	M	H	H	H	H	M	L

Dr.(Mrs.)A.Bharathi Lakshmi   Mrs.K.Kasthuri

Head of the Department   Course Teacher

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY
(2020 -2021 onwards)

Semester IV		Hours/Week: 2	
SEC 3	**NUMERICAL APTITUDE**	Credits: 2	
Course Code **20UITS41**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: define the concepts of Compound Ratios, Variation, Fourth, Third and Mean Proportional to enhance their skills to succeed in their professional development. [K1]

CO2: comprehend the basic concepts of quantitative ability to solve computational problems in real world based on their carrier. [K2]

CO3: locate the basic mathematical problems on Numbers, ages, time and ratios and apply their knowledge for specific real time problems. [K2]

CO4: practice for the various competitive examination based on ratios and proportions, time and work to meet industrial challenges. [K3]

CO5: categorize and communicate their conclusions in appropriate ways to transform innovative ideas into reality. [K4]

UNIT I

Problems on Numbers   (8 Hours)

UNIT II

Problems on Ages   (6 Hours)

UNIT III

Ratio and Proportions, Fourth, Third and Mean Proportional.   (5 Hours)

UNIT IV

Comparison of Ratios, Compound Ratio, Variation.   (5 Hours)

UNIT V

Time and Work.   (6 Hours)

TEXT BOOK

R.S.Aggarwal, (Reprint 2008).*Quantitative Aptitude,*S.Chand Publishers.

UNIT	CHAPTER	SECTIONS
I	7, 7A	Full
II	8, 8A	Full
III	12	1 – 30 problems only
IV	12	30 – 60 Problems only
V	15	1 – 40 problems only

REFERENCE BOOKS

1. Gourav.K.Singh, *Quantitative Aptitude,* Delhi :Khurana Publishing House Pvt. Ltd.,.

2. Navratan Singh, ManpreetCheema, *A New Approach to Numerical Ability for Competitive and Academic Examinations,* New Delhi :Dhillon Group of Publications.

3. Khurana, KJS. Rajeev Markanday, *Numerical Ability 18 Days Wonder,*S.Chand Publishers.

Course Code 20UITS41	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	M	H	L	L	L	L	L	H	L	-
CO2	M	H	L	M	M	M	M	H	L	-
CO3	M	H	M	L	M	L	L	H	L	-
CO4	M	H	M	M	H	H	M	H	L	-
CO5	M	H	M	M	H	H	M	H	L	-

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Head of the Department   Course Designer

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B.Sc. INFORMATION TECHNOLOGY
(2022 -2023 onwards)

Semester IV		Hours/Week: 2	
SEC 2	**NUMERICAL APTITUDE**	Credits: 2	
Course Code		Internal	External
20UITS41N		40	60

COURSE OUTCOMES

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

CO1: define the concepts of Permutations, Combinations, Sample space and

Probability of occurrence of an event to enhance their skills to succeed in their

professional development. [K1]

CO2: comprehend the basic concepts of quantitative ability to solve computational

Problem in real world based on their carrier. [K2]

CO3: locate the basic mathematical problems on numbers, ages, time and

probabilities and apply their knowledge for specific real time problems. [K2]

CO4: practice for the various competitive examination based on calendar, time and

work to meet industrial challenges. [K3]

CO5: categorize and communicate their conclusions in appropriate ways to transform

innovative ideas into reality. [K4]

UNIT I

Problems on Numbers   (8 Hours)

UNIT II

Problems on Ages   (6 Hours)

UNIT III

Calendar, Permutations and Combination   (5 Hours)

UNIT IV

Probability   (5 Hours)

UNIT V

Time and Work   (6 Hours)

TEXT BOOK

R.S.Aggarwal, (Reprint 2022).Quantitative Aptitude, S.Chand Publishing

UNIT	CHAPTER	SECTIONS
I	7	(1-40),(70-90) Problems only
II	8	Exercise A – (1-40) Problems only
III	27,30	27-Full 30-(1-10) Problems only
IV	31	1-30 Problems only
V	17	1-30 Problems only

REFERENCE BOOKS

1. Gourav.K.Singh, Quantitative Aptitude, Delhi :Khurana Publishing House Pvt. Ltd.,.

2. Navratan Singh, ManpreetCheema, A New Approach to Numerical Ability for

Competitive and Academic Examinations, New Delhi :Dhillon Group of Publications.

3. Khurana, KJS. Rajeev Markanday, Numerical Ability 18 Days Wonder,S.Chand

Publishers.

	PO1		PO2		PO3	PO4	PO5		PO6	PO7
Course Code (**20UITS41N**)	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	M	H	L	L	L	L	L	H	L	-
CO 2	M	H	L	M	M	M	M	H	L	-
CO 3	M	H	M	L	M	L	L	H	L	-
CO 4	M	H	M	M	H	H	M	H	L	-
CO 5	M	H	M	M	H	H	M	H	L	-

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Head of the Department   **Course Designer**

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY (2020-2021 onwards)

Semester IV		Hours/Week: 2	
SEC Practical 2	**MULTIMEDIA LAB**	Credits: 2	
Course Code **20UITS41P**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: use the Adobe Photoshop tools to write the basic text and image effects. [K3]

CO2: apply the Motion tween, Shape tween in Flash to write basic animation effects and use the drawing and painting tools in Photoshop to write the various effects. [K3]

CO3: explore the edited photoshop image and flash movie file. [K3]

CO4: complete the animation in Flash using action script, filter options, importing sounds and emphasis on web applications and mobile applications. [K3]

CO5: figure out the ability to edit photos and create own 2D short animation film to meet the emerging demand and contemporary challenges. [K4]

Lab Exercises

Photoshop

1. Editing a Photo.
2. Selecting a person from a photo.
3. Illustrating usage of CMYK and RGB color models.
4. Picture within Text.
5. Creating Changing Seasons.
6. Candle flame Animation.
7. Creating 3D Photo Cube.
8. Dripping Blood Animation.
9. Lens Flare Effect.
10. Zoo Creation.
11. Creating Scenery.
12. Creating Snap Shot.

13. Giving Shadow Effect for the Boy.

14. Creating Pin on Button.

15. Giving Shadow Effect for the Text.

16. Creating Glassy Characters.

17. Enhancing an Old Image to a Color Image. (Healing Brush Tool)

18. Creating Film Strip.

19. Jewel Coloring (History Brush Tool).

20. Making Silhouette.

Flash

21. Study about Timeline concepts, insert text, image. Use Scaling, rotation alignment.

22. Export movie using multiple scenes.

23. Study masking concepts.

24. Add effects to the text (Predefined and user defined)

25. Add buttons, menus, and actions to the movie.

26. Implement the animations using action script

Course Code 20UITS41P	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	H	M	M	H	H	M	H	M	L	-
CO2	H	L	M	H	H	H	M	H	L	-
CO3	H	H	H	H	M	M	H	M	L	-
CO4	M	H	H	M	M	H	M	H	L	-
CO5	H	H	H	M	M	H	M	H	L	-

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VIRUDHUNAGAR – 626 001
B.Sc. INFORMATION TECHNOLOGY
(2022 -2023 onwards)

Semester IV		Hours/Week: 2	
SEC Practical 3	**MULTIMEDIA LAB**	Credits: 2	
Course Code **20UITS41PN**		Internal 40	External 60

COURSE OUTCOME

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

CO1: use the Adobe Photoshop tools to write the basic text and image effects. [K3]

CO2: apply and write basic animation effects and use the drawing and painting tools in Photoshop to write the various effects. [K3]

CO3: explore the edited photoshop image and canva file. [K3]

CO4: complete the animation to design cards, Banner and packaging design using Canva. [K3]

CO5: figure out the ability to edit photos and create their own 2D short animation film to meet the emerging demand and contemporary challenges. [K4]

Lab Exercises

Photoshop

1. Picture within a Text
2. Cloning and Transformations
3. Making Silhouette Images
4. Candle flame Animation
5. Blur effect
6. Pencil Drawing
7. Red Eye Removal
8. Heart Beat Animation
9. Sunset using Layer mask
10. Apple in a Palm using Layer mask
11. Editing a Photo.
12. Selecting a person from a photo.
13. Creating 3D Photo Cube.

14. Dripping Blood Animation

15. Giving Shadow Effect for the image and text.

16. Creating Glassy Characters.

17. Enhancing an Old Image to a Color Image. (Healing Brush Tool)

Canva

18. Designing a Banner in Canva

19. Designing a Brochure in Canva

20. Designing a Pamphlet in Canva

21. Designing a Hotel menu card in Canva

22. Designing a Invitation in Canva

23. Create a Product packaging design in Canva

24. Designing a certificate using Canva

25. Designing a flyer using Canva

Course Code 20UITS41PN	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	H	M	M	H	H	M	H	M	L	-
CO2	H	L	M	H	H	H	M	H	L	-
CO3	H	H	H	H	M	M	H	M	L	-
CO4	M	H	H	M	M	H	M	H	L	-
CO5	H	H	H	M	M	H	M	H	L	-

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B.Sc. INFORMATION TECHNOLOGY
(2020 -21 onwards)

Semester V		Hours/Week: 5	
Core Course - 6	**VB.Net PROGRAMMING**	Credits: 5	
Course Code		Internal	External
20UITC51		25	75

COURSE OUTCOMES:

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

CO1: Recall .NET framework and can realize some of the major enhancements in the VB.net to enhance their learning. [K1]

CO2: Outline the concept of programs using primitives and constructs in VB .NET to solve various computing problems. [K2]

CO3: Apply the various controls in VB.NET and be able to develop programs using controls to solve the real-world problems to enhance their knowledge. [K3]

CO4: analyze the concept of inheritance and develop code to create objects through the use of inheritance controls to solve the real-world problems. [K4]

CO5: Explain and Implement database connectivity using ADO.NET in a window-based application that will improve their lifelong learning. [K5]

UNIT I

   The Visual basic Language: Operators, Conditionals, and keywords : The Visual Basic Keywords - Visual Basic Statements -All About Statement Syntax - The Option and Imports Statements - Immediate Solutions: Declaring Constants   - - Creating -Enumerations-Declaring Variables-What Data Types Are Available?- Converting between Data Types Checking Data Types-Declaring Arrays and Dynamic Arrays Handling Strings-Converting Strings to Numbers and Back Again Converting between Characters and Character Codes Using Visual Basic Operators-Understanding Visual Basic Operator Precedence Commenting Your Code-Making Decisions with If Else Statements Using Select Case-Making Selections with Switch and Choose-Looping to Execute Statements Repetitively Using the Do Loop-Using the For Loop-Using the For Each Next -Loop Using the While Loop-The With Statement Handling Higher -Math Handling Dates and Times Handling Financial Data.

Procedures, Scope, and Exception Handling: Sub Procedures and Functions - Understanding Scope - Handling Exceptions - Creating Sub Procedures - Creating Functions - Commenting Your Procedures - Passing a Variable Number of Arguments - Specifying Optional Procedure Arguments - Preserving a Variable's Values between Procedure Calls with static Variables - Creating Procedure Delegates - Creating Properties - Understanding Scope - Using Unstructured Exception Handling - Using Resume Next and Resume Line - Using On Error GoTo 0 - Getting an Exception's Number and Description - Raising an Exception Intentionally - Using Structured Exception Handling - Exception Filtering in the Catch Block – Using Multiple Catch Statements - Using Finally Throwing an Exception - Throwing a Custom Exception.

(15 Hours)

UNIT II

Windows Forms: All About Windows Forms- All About Windows MDI Forms Creating Windows Applications - Adding Controls to Forms Handling Events- A Windows Form in Code- Immediate Solutions: Setting Title Bar Text Adding/Removing Min/Max Buttons and Setting a Form's Setting Control Tab Order - Setting Forms' Initial Positions- Moving and Sizing Forms and Controls in Code - Showing and Hiding Controls and Forms - Using the MsgBox Function -Using the MessageBox. Show Method – Using the InputBox Function Working with Multiple Forms - Using Properties to Communicate between Forms - Setting the Startup Form - Creating Multiple Document Interface (MDI) Applications – Creating Dialog Boxes – Creating Owned Forms - Passing Forms to Procedures - Minimizing/Maximizing and Enabling/Disabling Forms – Adding and Removing Controls at Run Time -Creating Always-on-Top Forms - Using Visual Inheritance between Forms - Handling Mouse Events - Handling Keyboard Events - Sending Keystrokes to Other Programs - Beeping.

Immediate Solutions: Text Boxes - Creating Multiline, Word-wrap Text Boxes - Accessing Text in a Text Box - Adding Scrollbars to Text Boxes - Aligning Text in Text Boxes - Making a Text Box Read-only - Selecting and Replacing Text in a Text Box - Copying or Getting Selected Text to or from the Clipboard - Creating a Password Control - Controlling Input in a Text Box - - Creating a Textbox in Code - Rich Text Boxes - Accessing Text in a Rich Text Box - Creating Bold, Italic, Underlined, and Strikeout Text - Indenting Text in Rich Text Boxes - Adding Bullets to Rich Text Boxes -Setting Text Color in RTF Boxes - Saving and Loading RTF Files from and to Rich Text Boxes - Aligning Text in a Rich Text Box - Creating Rich Text Boxes in Code – Labels - Using Labels Instead of Text Boxes Formatting Text in Labels - Aligning Text in Labels - Handling Label Events - Using Labels to Give Access Keys to Controls without Captions – Link Labels - Creating a Link Label - Creating a Link Label in Code - Linking to Another Form - Linking to the Web. (12 Hours)

UNIT III

Buttons, Checkboxes, Radio Buttons, Panels, and Group: Immediate Solutions: Buttons - Setting a Button's Caption - Setting a Button's Foreground and Background Color - Setting Button Fonts - -Handling Button Clicks Imitating Control Arrays - Resetting the Focus after a Button Click - Giving Buttons and Other Controls Access Characters -   Setting Button Tab Order - Disabling Buttons - Showing and Hiding Buttons - Resizing and Moving Buttons from Code - Adding a Picture to a Button - Adding Buttons at Run Time - Passing Buttons to Procedures - Handling Button Releases - Using the Checkbox Class - Creating Checkboxes - Getting a Checkbox's State Setting a Checkbox State - Creating Three-State Checkboxes - Using the Radio Button Class - Creating Radio Buttons - Getting a Radio Button's State - Setting a Radio Button's State - Creating Toggle Buttons - Using the Panel Class - Creating Panels- Adding Controls to Panels in Code - Using the Group Box Class - Creating Group Boxes - Adding Controls to Group Boxes in Code.   (17 Hours)

UNIT IV

List Boxes, Checked List Boxes, Combo Boxes and Picture Boxes: Using the List Box Class - Adding Items to a List box - Referring to Items in a List Box by Index - Responding to List box Events - Removing Items from a List Box -Sorting a List Box - Determining How Many Items Are in a List Box - Determining Which List Box Items Are Selected - Making List Boxes Scroll Horizontally - Creating Multi Select List Boxes - Clearing a List box - Using the CheckedListBox Class - Adding Items to Checked List Boxes - Determining What Items Are Checked in Checked List Boxes - Checking or Unchecking Items in Checked List Boxes from code- Handling Item Check Events in Checked List Boxes - Using the ComboBox Class - Creating Simple Combo Boxes, Drop-down Combo Boxes, a Adding Items to a Combobox - Responding to Combo Box Selections Removing Items from a ComboBox - Getting the Current Selection in a Combo Box Sorting a Combobox - Clearing a Combo Box- Getting the Number of Items in a Combo Box - Sorting Objects in a List Box or Combo Box - Using the PictureBox Class - Setting or Getting the Image in a Picture Box Adjusting Picture Box Size to Contents - Handling Picture Box Events (and Creating Image Maps)

Menus, Built-in Dialog Boxes: Using the MainMenu Class- - Using the MenuItem Class - Creating Menus - Creating Submenus -Adding Checkmarks to Menu Items - Creating Menu Access Keys - Creating Menu Shortcuts - Changing a Menu Item's Caption at Run Time- Creating Menu Separators -Using the Popup Event - Showing and Hiding Menu Items   -Disabling Menu Items - Drawing Menu Items Yourself - Creating Menus in Code Merging MDI Menus -Creating MDI Window

Menus - Using the ContextMenu Class - Creating Context Menus - Using the OpenFileDialog Class - Creating Open File Dialogs - Using the SaveFileDialog Class - Creating Save File Dialogs - Using the FontDialog Class - Creating Font Dialogs - Using the ColorDialog Class - Creating Color Dialogs

(16 Hours)

UNIT V

Object-Oriented Programming: Classes and Objects - Fields, Properties, Methods, and Events - Class vs. Object Members - Abstraction, Encapsulation, Inheritance, and Polymorphism - Overloading, Overriding, and Shadowing - Constructors and Destructors - An OOP Example - Structures and Modules.

Data Access with ADO.NET: What Are Databases? - Accessing Data with the Server Explorer Accessing - Data with Data Adaptors and Datasets - Working with ADO.NET - Overview of ADO.NET Objects -Immediate Solutions: Using Basic SQL Using the Server Explorer - Creating a New Data Connection - Dragging Tables from the Server Explorer to a Form Creating a Dataset - Populating a Dataset - Displaying Data in a Data Grid - Selecting a Data Provider (SQL Server, MS Jet, and so) - Data Access Using Data Adapter Controls - Previewing Data from Data Adapters- Examining Dataset Properties Examining Dataset Schema - Using Relational Databases - Adding Multiple Tables to a Dataset – Using data Views

(15 Hours)

TEXT BOOK

Visual Basic.Net Programming Black Book, Steven Holzner, Paraglyph Press,USA

UNIT	CHAPTER	Page No.
I	2,3	62-95,96-135
II	4,5	138-188,200-226
III	6	233-259
IV	7,9	268-298,355-387
V	11,21	448-472,822-860

REFERENCE BOOKS

1. Matthew MacDonald ,Microsoft Visual Basic .NET Programmer's CookbookJul 2, 2003.

2. Jonathan S. Harbor, Microsoft Visual Basic .NET Programming for the Absolute BeginnerSep 20, 2002.

3. JMatthew MacDonald,The Book of VB .NET: .NET Insight for VB Developers, Feb 2002.

Course Code 20UITC51	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	H	L	M	M	M	H	H	M	L	L
CO2	H	M	M	M	M	H	M	H	L	L
CO3	H	M	M	M	H	H	M	H	L	L
CO4	H	M	M	H	H	H	H	M	L	L
CO5	M	M	H	M	H	H	H	M	L	L

Dr.(Mrs).A.Bharathi Lakshmi   Dr.(Mrs). J.Kalavathi

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VIRUDHUNAGAR - 626 001

B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(2020– 21 onwards)

Semester V		Hours/Week: 5	
Core Course – 7	**SOFTWARE ENGINEERING**	Credits: 5	
Course Code		Internal	External
20UITC52		25	75

COURSE OUTCOMES

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

CO1 : relate the concepts of software engineering basics, planning, cost estimation, SRS, design, verification, validation and maintenance. [K1]

CO2 : Illustrate about software project base ideas, planning activities, software cost, requirement specification, design activities, verification, validation techniques and maintenance. [K2]

CO3 : utilize the software engineering concepts to choose appropriate life cycle model, quality factors, estimate cost, plan, design notations and testing for software maintenance and implementations. [K3]

CO4 : discover the concepts of quality and modularization, project size, planning activities, SRS, verification, validation for software configurations. [K4]

CO5 : measures planning an organizational structure, software cost estimation techniques, design techniques, modern programming language features, quality assurance for real time project implementations. [K5]

UNIT I

    Introduction to Software Engineering: Introduction – Some definitions – Some size factors - Quality and productivity factors – Managerial issues.

    Planning a Software Project: Introduction –Defining the problem – Developing a solution strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.   (15 Hours)

UNIT II

Software Cost Estimation: Introduction – Software Cost factors – Software cost estimation techniques – staffing level estimation – estimating software maintenance costs.

Software Requirements Definition: Introduction – The software requirements specification – formal specification techniques. (15 Hours)

UNIT III

Software Design: Introduction – Fundamental Design Concepts – Modules and modularization Criteria – Design Notations – Design Techniques – Design Guidelines.

(15 Hours)

UNIT IV

Implementation Issues: Introduction – Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

Modern Programming Language Features: Introduction – Type Checking – Separate Compilation – User-Defined Data Types – Data Abstraction. (15 Hours)

UNIT V

Verification and Validation Techniques: Introduction – Quality assurance – Static analysis – symbolic execution – Unit Testing and Debugging – System testing.

Software Maintenance: Introduction – Managerial aspects of software maintenance – Configuration management – source code metrics. (15 Hours)

TEXT BOOK

Richard Fairley, E., (2011) *Software Engineering Concepts*, New Delhi :Tata McGraw Hill.

UNIT	CHAPTER	SECTION
I	1	1.1 to 1.4
	2	2.1 to 2.5
II	3	3.1 to 3.4
	4	4.1to 4.2
III	5	5.1 to 5.4,5.9
IV	6	6.1 to 6.4
	7	7.1 to 7.4
V	8	8.1, 8.3 to 8.6
	9	9.2 to 9.4

REFERENCE BOOKS

1. Jawadekar, (2004). *Software Engineering*, New Delhi :Tata McGraw Hill.

2. Roger Pressman, S. (2010).*Software Engineering: A practitioner's approach*, New Delhi : McGraw-Hill.

3. Rajib Mall, (2014). *Fundamentals of Software Engineering*, Delhi :PHI Learning Private Limited.

Course Code 20UITC52	PO 1		PO 2		PO 3	PO 4	PO 5		PO 6	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	M	H	M	H	M	H	H	H	H	L
CO2	M	H	H	H	H	H	H	L	M	-
CO3	M	M	L	L	H	H	M	H	H	L
CO4	M	M	H	M	H	H	M	H	M	-
CO5	H	M	H	M	H	H	H	M	M	L

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B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(2020 – 21 onwards)

Semester V		Hours/Week: 5	
Core Course – 8	**DESIGN AND ANALYSIS OF COMPUTER ALGORITHMS**	Credits: 5	
Course Code **20UITC53**		Internal 25	External 75

COURSE OUTCOMES

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

CO1 : list out the time and space complexity required to execute the different algorithms and its implementation techniques to compute the solution for real world problems in easier manner. [K1]

CO2 : illustrate the importance of choosing efficient data structures and the algorithm design techniques to solve the complex problems easily and to improve their lifelong learning. [K2]

CO3 : apply the different problem solving techniques and its algorithms to find the solution for optimization, coloring, sorting and graphical problems to enhance their knowledge. [K3]

CO4 : analyze the various algorithm design techniques based on their performance and ordering them to solve real time problems. [K4]

CO5 : evaluate the amount of time and space needed to execute the particular algorithm to solve the optimization and sorting problems that will be helpful to meet industrial challenges. [K5]

UNIT I

Algorithms: Efficiency, Analysis and Order: Algorithms – Importance of developing efficient algorithms – Analysis of Algorithms - Order. (15 Hours)

UNIT II

Divide – and – Conquer: Binary Search – Merge Sort – Divide and Conquer Approach - Quick Sort – Strassen's Matrix Multiplication Algorithm, Arithmetic with Large Numbers – Determining Thresholds.   (15 Hours)

UNIT III

Dynamic Programming: Binomial coefficients – Floyd's algorithm for Shortest Paths – Dynamic programming and Optimization problems – Chained Matrix Multiplication - Optimal Binary Search tree – The Travelling Salesperson problem.   (15 Hours)

UNIT IV

Greedy Approach: Minimum Spanning Trees – Dijkstra's algorithm for Single source shortest path – Scheduling – Huffman Code – A Greedy Approach to the 0/1 Knapsack problem.

(15 Hours)

UNIT V

Backtracking: The Backtracking Techniques – n Queens Problem – Sum of Subsets Problem – Graph Coloring – Hamiltonian Circuits.- The 0-1 Knapsack Problem.   (15 Hours)

TEXT BOOK

Richard Neapolitan, Kumarss Naimipour, (2004). *Foundations of Algorithms Using C++ Pseudo code*, Third edition, New Delhi : Narosa Publication.

UNIT	CHAPTERS	SECTIONS
I	1	1.1-1.2,1.3,1.4
II	2	2.1- 2.7
III	3	3.1- 3.6
IV	4	4.1 - 4.4,4.5.1
V	5	5.1 – 5.7

REFERENCE BOOKS

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, (2005). *Fundamentals of Computer Algorithms*, Delhi: Galgotia publications.

2. Thomas Cormen, H., Charles Leiserson, E., Ronald Rivest, L., Clifford Stein, (2006). *Introduction to Algorithms,* Delhi: Prentice Hall of India.

3. Hemant Jain, (2006). *Problem Solving in Data Structures & Algorithms*, Delhi : Pearson Education.

Course Code 20UITC53	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	H	M	M	H	H	L	H	M	M	-
CO2	H	H	L	H	M	M	H	H	M	-
CO3	H	L	H	M	H	H	H	M	H	-
CO4	H	H	L	M	H	M	H	H	M	-
CO5	H	H	L	H	H	M	H	H	H	-

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V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(2020 – 21 onwards)

Semester V		Hours/Week: 5	
Core Practical – 5	**VB.NET PROGRAMMING LAB**	Credits: 2	
Course Code		Internal	External
20UITC51P		40	60

COURSE OUTCOMES:

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

CO1 : Apply and identify the importance of object-oriented programming and how to develop small programs to upgrade the skills. [K3]

CO2 : Develop string manipulation, events and exception handling problems within .NET application environment and find the solutions for real world problems. [K3]

CO3 : Experiment with the usage of controls to create websites and depict the knowledge of object – oriented concepts to enhance their knowledge. [K3]

CO4 : Make use of ADO .NET and develop database applications using .NET framework to develop the technical projects in an easier manner. [K3]

CO5 : Analyze Database operations using ADO.Net connectivity and find the solutions for Windows Form and web applications using .NET applications to become a professional developer. [K4]

Console Applications:

Using Structure and Enum

1. Write a VB.Net program to Create, Delete and search an address in an address book using an array of Structures.

2. Write a VB.Net Program to Display Students' mark list using enumeration.

   Using Class and Methods

3. Write a VB.Net Program to perform following string operations

i) Length

ii) Substring

iii)   Replacing

iv)   String Comparison

v)   String Reverse

vi)   Uppercase

vii)   Lowercase

viii)   Concatenation

ix)   Trim

4.   Write a VB.Net Program to find the Volume for different Shapes.

5.   Write a VB.Net Program to sort a given set of names.

Using Functions

6.   Write a VB.Net Program to generate prime and perfect numbers.

Using Built-in Classes

7.   Write a VB.Net Program to perform

i) Array List   ii) Bit Array   iii) Queue   iv) Stack Operations.

Windows Applications

Using Constructor

8.   Write a VB.Net Program to find Square and cube of a given number.

Using Constructor Overloading

9.   Write a VB.Net Program to display the hour, Minute and Second using Constructor Overloading.

Using Inheritance and Form Inheritance

10.   Write a VB.Net Program to find Volume of different Shapes

11.   Write a VB.Net Program to display date and time using form inheritance.

Using Interface and Exception

12.   Write a VB.Net Program to set and display the next value.

13.   Write a VB.Net Program to perform system defined exception.

Windows Control Applications

14.   Design a calculator.

15.   Perform Date Functions.

16.   Design a Digital Clock

17.   Display image manually and automatically in the Picture Box using Track Bar.

Using File Streams

18.   Write a VB.Net Program to count Words, Characters and Sentences present in a file using

Streams.

ADO.NET PROGRAMMING

19.   Develop a package for student data processing.

20.   Develop a package for employee data processing.

Course Code 20UITC51P	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	H	H	H	H	H	H	H	M	M	L
CO2	H	H	H	H	H	H	M	H	M	L
CO3	H	M	H	M	H	H	M	H	H	L
CO4	M	M	H	H	M	H	M	H	H	L
CO5	L	M	H	H	L	M	L	M	H	L

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B.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester V		**SYSTEM SOFTWARE**	Hours/Week : 4	
DSEC 1			Credits : 4	
Course Code			Internal	External
20UITE51			25	75

COURSE OUTCOMES

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

CO1 : recall the relationship between system software and machine architecture, assembler features, loader functions, macro processor, compiler and other system software functions. [K1]

CO2 : outline the concepts of one pass, two pass and multi pass assemblers, loaders and linkers, SIC, macro processors, machine codes, debugging process and lexical analysis phase for the generation of machine codes. [K2]

CO3 : construct simplified instructional computer, machine dependent and independent assembler, compiler, macro processor to generate executable files and create database. [K3]

CO4 : examine the architecture of RISC, CISC, the text editors, the functions of assemblers, loaders, macro processors design options for the object program enhancement. [K4]

CO5 : measures evaluation processes, system software tools and functionality of linkers and compilers for the core functions of operating systems and interactive debugging systems. [K5]

UNIT I

Background: Introduction – System Software and Machine Architecture – The Simplified Instructional Computer (SIC) – Traditional (CISC) machines – R1ISC Machines

(12 Hours)

UNIT II

Assemblers: Basic Assembler Functions – Machine-Dependent Assembler Features – Machine-Independent Assembler Features – Assembler Design Options   (12 Hours)

UNIT III

Loaders and Linkers: Basic Loader Functions – Machine-Dependent Loader Features - Machine-Independent Loader Features - Loader Design Options   (12 Hours)

UNIT IV

Macro Processors: Basic Macro Processor Functions – Machine-Independent Macro Processor Features – Macro Processor Design Options (12 Hours)

UNIT V

Compilers: Basic Compiler Functions: Grammers – Lexical Analysis. **Other System Software:** Database Management Systems – Text Editors – Interactive Debugging Systems.

(12 Hours)

TEXT BOOK

Leland L. Beck &Manjula, D. (2009), *System Software - An Introduction to Systems Programming*.3rd Edition. India: Pearson Education.

UNIT	CHAPTER	SECTION
I	1	1.1 - 1.5
II	2	2.1 - 2.4
III	3	3.1 - 3.4
IV	4	4.1 - 4.3
V	5	5.1 - 5.1.2
	7	7.1 – 7.3

REFERENCE BOOKS

1. Dhamdhere. (2006). *System Programming and Operating Systems*. India: Tata McGraw Hill Education Private Limited.

2. Donovan. (2001). *Systems Programming*. India: Tata McGraw Hill Education Private Limited.

3. Dr. Ikvinderpal Singh. (2015). System software – An Introduction to Systems Programming. India: Khanna Book Publishing Company.

Course Code 20UITE51	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	H	M	H	L	M	M	L	M	M	-
CO2	H	H	L	M	H	L	-	L	M	L
CO3	H	L	M	M	M	M	M	H	-	L
CO4	H	H	M	L	H	H	M	L	L	H
CO5	H	H	M	L	H	H	M	M	-	-

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY
(2020 -21 onwards)

Semester V		Hours/Week: 4	
DSEC 1	**COMPUTER GRAPHICS**	Credits: 4	
Course Code		Internal 25	External 75
20UCAE52			

COURSE OUTCOMES

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

CO1 : identify the applications of Computer Graphics, recognize the devices of the graphics system, describe the output primitive attributes, the concepts of geometric transformations, visible-surface, viewing pipeline and clipping operations. [K1]

CO2 : understand the basics of computer graphics , 2D and 3D Transformations, attributes of output primitive, clipping algorithms, graphical user interfaces and interactive input methods. [K2]

CO3 : use geometric transformations on graphics objects and their application in composite form, and to know how graphical input and output devices work, solve the problems on viewing transformations. [K3]

CO4 : analyse how primitive graphical objects are generated in the computer, compare the algorithms for drawing a point, line, circle., classify the visible-surface detection methods. [K4]

CO5 : create programs for real time applications by implementing algorithms of computer graphics. [K5]

UNIT I

A Survey of Computer Graphics: Computer Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces.

Overview of Graphics System: Video Display Devices, Refresh Cathode-Ray Tubes, Raster-Scan Displays, Random-Scan Displays, Color CRT Monitors, Direct-View Storage Tubes, Flat-Panel Displays –Raster-Scan Systems: Video Controller, Raster-Scan Display Processor – Random-Scan Systems – Graphics Monitors and Workstations.   (12 Hours)

UNIT II

Overview of Graphics System – Input Devices: Keyboards, Mouse, Trackball and Spaceball, Joysticks, Data Glove, Digitizers, Image Scanners, Touch Panels, Light Pens, Voice Systems – Graphics Software: Coordinate Representations, Graphics Functions, Software Standards, PHIGS Workstations.

Output Primitives : Points and Lines – Line Drawing Algorithms : DDA Algorithm, Bresenham's Line Algorithm, Parallel Line Algorithm – Circle-Generating Algorithms: Properties of Circles, Midpoint Circle Algorithm – Pixel Addressing and Object Geometry: Screen Grid Coordinates, Maintaining Geometric Properties of Displayed Objects – Filled-Area Primitives: Boundary-Fill Algorithm and Flood Fill Algorithm - Character Generation.

(12 Hours)

UNIT III

Attributes Of Output Primitives: Line Attributes: Line Type, Line Width, Pen And Brush Options, Line Color – Character Attributes: Text Attributes, Marker Attributes.

Two-Dimensional Geometric Transformations: Basic Transformations: Translation, Rotation, Scaling - Matrix Representations And Homogeneous Coordinates – Composite transformation: Translations, Rotations, General Pivot-Point Rotation, fixed-point Scaling   - Other Transformations: Reflection, shear.

Three-Dimensional Geometric Transformations: Translation, Coordinate-Axes Rotation, Scaling, Reflections and Shears.   (12 Hours)

UNIT IV

Two Dimensional Viewing: The Viewing Pipeline – Viewing Coordinate Reference Frame – Window-To-Viewport Coordinate Transformation – Two-Dimensional Viewing Functions – Clipping Operations – Line Clipping: Cohen-Sutherland Line Clipping – Text Clipping – Exterior Clipping.

(12 Hours)

UNIT V

Graphical User Interfaces And Interactive Input Methods: The User Dialogue: Windows and Icons, Accommodating Multiple Skill Levels, Consistency, Minimizing Memorization, Backup and Error Handling, Feedback - Input Of Graphical Data - Logical Classification Of Input Devices: Locator Devices, Stroke Devices, String Devices, Valuator Devices, Choice Devices, Pick Devices - Input Functions: - Interactive Picture Construction Techniques.

Visible-Surface Detection Methods: Classification of visible-Surface Detecting Algorithm – Back-Face Detection – Depth – Buffer Method. (12 Hours)

TEXT BOOK

Donald Hearn, M. Pauline Baker,(2011), *Computer Graphics C Version*, Second Edition, Prentice Hall of India Private Limited.

UNIT	CHAPTER	SECTION
I	1	Chapter 1 Full
	2	2.2, 2.3(Page No 56 to 67)
II	2	2.5, 2.7
	3	3.1, 3.2, 3.5, 3.6, 3.10, 3.11, 3.14
III	4	4.1, 4.5, 5.1, 5.2, 5.3 (Page No 211,
	5	212, 213), 5.4
IV	6	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 (Page No 246 to 250), 6.10, 6.11
V	8	8.1, 8.2, 8.3, 8.5
	13	13.1, 13.2, 13.3

REFERENCE BOOK

Malay K.Pakhira, (2010).*Computer Graphics Multimedia and Animation*– 2nd Edition. PHI Learning Private Limited.

Course Code 20UCAE52	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	H	M	-	M	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	M	M	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	L	M	-	-
CO5	-	M	L	-	-	-	-	H	L	-

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(2020 – 21 onwards)

Semester V		**CLOUD COMPUTING**	Hours/Week: 4	
DSEC 1			Credits: 4	
Course Code			Internal	External
20UITE53			25	75

COURSE OUTCOMES

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

CO1: Learn and identify the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing. [K1]

CO2: Recognize the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud and the concept of Virtualization and Virtual Clusters through designing the real-time applications. [K2]

CO3: Identify the importance of virtualization and how this has enabled the development of Cloud Computing in real time web services. [K3]

CO4: Criticize the key aspects and evolution of cloud computing in current technical concepts and practices. [K4]

CO5: Discriminate the Challenges faced by the cloud data in security in the real world based on their carrier. [K5]

UNIT I

   Cloud Architecture: An Overview – Technologies For Network – Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. (12 Hours)

UNIT II

   Cloud Computing Models: Introduction – Characteristics of a Cloud – Cloud Service and Models (IaaS, PaaS, SaaS) – Cloud Deployment Models – Public vs Private Cloud – Cloud Solution – Cloud Ecosystem – Service Management – Computing On Demand. (12 Hours)

UNIT III

Virtualization: Introduction – Basic of Virtualization – Types of Virtualization – Implementation Levels of Virtualization – Virtualization Structures / Tools and Mechanisms – Virtualization of CPU, Memory, I/O Devices – Virtual Clusters and Resource Management – Virtualization for Data – Center Automation. (12 Hours)

UNIT IV

Cloud Infrastructure: Architectural Design of Compute and Storage Clouds – Layered Cloud Architectural Development – Virtualization Support and Disaster Recovery – Architectural Design Challenges – Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Virtual Machine Creation and Management – Global Exchange of Cloud Resources. (12 Hours)

UNIT V

Security in the Cloud: Security Overview – Cloud Security Challenges – Software– As – A – Service Security – Autonomic Security. (12 Hours)

TEXT BOOK

Dr.A.Priya, (2016 reprint), *Cloud Computing*, Margham Publications.

UNIT	CHAPTER
I	1
II	2
III	3
IV	4
V	6

REFERENCE BOOKS

1. Thomas Erl, Ricardo Puttini, Zaigham Mahmood, (2013), *Cloud Computing: Concepts, Technology & Architecture*, Prentice Hall

2. Lars Nielsen, *The Little Book of Cloud Computing*, New Street Communications.

3. Ray Rafaels, (2015), *Cloud Computing: From Beginning to End*, CreateSpace Independent Publishing Platform.

Course Code 20UITE53	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	H	M	H	L	H	M	H	M	L	-
CO2	H	M	H	L	H	H	H	M	-	-
CO3	H	M	H	L	H	M	H	M	-	-
CO4	H	M	H	L	H	H	H	M	-	-
CO5	H	M	H	L	H	H	H	M	-	-

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VIRUDHUNAGAR - 626 001
B.Sc. INFORMATION TECHNOLOGY (SEMESTER)
(2020 – 2021 onwards)

Semester V	**SYSTEM TESTING LAB**	Hours/Week: 4	
DSEC 2		Credits: 2	
Course Code		Internal	External
20UITE51P		40	60

COURSE OUTCOMES

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

CO1 : construct and test sample programs by using different testing techniques and learn test case designing. [K3]

CO2 : identify the Fault cases in the program with that its logic validation data analysis before they are used. [K3]

CO3 : discover and test different a range of software testing techniques and strategies for the real time projects. [K3]

CO4 : Develop the basic path testing cases and procedures for the verification process. [K3]

CO5 : analyze the different types of test cases to understand real world IT problem. [K4]

1. Design and develop a program in a language of your choice to solve the triangle problem defined as follows:

   (i)Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all.

   (ii)Derive test cases for your program based on decision-table approach, execute the test cases and discuss the results.

2. Decision table approach for the above triangle solving problem.

3. Boundary value analysis program for the above design plan.

4. Equivalence class partitioning program for the above design plan

(i) Design and develop code and run the program in nay suitable language to solve the commission problem.

(ii) Analyze it from the perspective of boundary value, derive test cases, execute these test cases and discuss the test results.

5.   Dataflow testing for the commission calculation for the above design and analyze problem.

6.   Equivalence Class partitioning test cases for the above design and analyze.

7.   Decision Table for Commission Problem.

8.   Binary Search - Path Testing.

9.   Quick Sort-Path Testing.

10.   Boundary Value Analysis test cases for Next Date function.

11.   Equivalence class test cases for Next Date function.

Course Code 20UITE51P	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	H	H	M	H	H	H	H	M	H	-
CO2	H	H	M	H	H	H	M	H	M	-
CO3	H	H	H	H	H	M	M	M	H	-
CO4	H	H	H	H	L	H	M	M	M	-
CO5	M	L	H	H	M	H	M	M	H	-

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B.Sc. INFORMATION TECHNOLOGY

(2020 -21 onwards)

Semester V		Hours/Week: 4	
DSEC 2	**COMPUTER GRAPHICS PROGRAMMING LAB**	Credits: 2	
Course Code **20UCAE52P**		Internal 40	External 60

COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1   :   apply the specification of syntax and rules for C Graphics functions. [K3]

CO2   :   write programs using C for drawing pixel, line, circle, text, filling and clipping objects, 2D and 3D transformations. [K3]

CO3   :   execute the programs with required input. [K3]

CO4   :   prepare the record with the neat output. [K3]

CO5   :   analyze and test program with different inputs and justify the result. [K4]

Write a C program to

1.   draw a pixel, line and circle.

2.   draw a line using DDA algorithm.

3.   draw a line using Bresenham's line drawing algorithm.

4.   draw a circle using midpoint circle drawing algorithm.

5.   translate and rotate an object in 2D.

6.   reflect and scale an object in 2D.

7.   translate and rotate an object in 3D.

8.   reflect and scale an object in 3D.

9.   fill an object using floodfill and boundary fill algorithm.

10.   implementcohen Sutherland line clipping algorithm.

11.   display text in different sizes, colors and font styles by using graphics functions.

Course Code 20UCAE52P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	H	H	-	-	-	-	-	-	-
CO2	H	H	M	M	M	-	-	-	-	L
CO3	M	L	L	H	M	L	L	M	-	-
CO4	M	-	L	M	-	L	H	M	-	L
CO5	M	M	L	-	-	-	-	H	M	-

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B.Sc. INFORMATION TECHNOLOGY

(2020 –21 onwards)

Semester VI		Hours/Week: 4	
DSEC 2	**LINUX PROGRAMMING LAB**	Credits: 2	
Course Code		Internal	External
20UITE53P		40	60

COURSE OUTCOMES

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

CO1:   identify the basic set of Linux commands and utilities to deliver a best quality product. [K3]

CO2:   organize basic fundamental utilities that are necessary on a modern operating system. [K3]

CO3:   apply the important Linux/UNIX Library functions and system calls to provide software-based solutions. [K3]

CO4:   develop shell scripts that enhance the usefulness of computers. [K3]

CO5:   discover various filter and server commands in Linux Operating System that supports in life long learnings. [K4]

Shell Script

1.   Write a shell script to demonstrate various options of LS Command.

2.   Write a shell script to demonstrate various options of WHO Command.

3.   Write a shell script to view and change the file permission.

4.   Write a shell script to perform various directory operations (create, view, delete).

5.   Write a shell script to perform various file operations (create, copy, view, delete).

6.   Write a shell script to concatenate the contents of two file and save it to third file.

7.   Write a shell script to display the message according to the system and user time.

8.   Write a shell script to count the number of words, characters and lines.

9.   Write a shell script to list all files whose size is greater than specific size.

10.   Write shell script to read user name and find whether the user is currently working in the system or not.

11.   Write shell script to list and delete the zerobyte files.

12.   Write a shell script to compare two files using comm, cmp, diff commands

13.   Write a shell script to split the file and Login details.

14.   Write a shell script to count the particular word using grep.

15.   Write a shell script to replace a occurrence of word using grep and sed.

16.   Write a Script to perform Arithmetic Operations.

17.   Write a Script to display current date, time, username and current directory.

18.   Write a Script to convert the contents of a given file from uppercase to lowercase.

19.   Write a Script to determine whether given command line argument ($1) contains "*" symbol or

not, if $1 does not contains "*" symbol add it to $1, otherwise show message "Symbol is not

required".

20.   Write a Script to check whether a given number is palindrome or not.

21.   Write a Shell script to show various system configuration like

      a. Currently logged user and his long time

      b. Home Directory

      c. Operating System type

      d. Currently working Directory

      e. Show all available shells

22.   Write a shell script to list the files arranged in descending order of their size.

23.   Write a Shell Script to find the reverse of a given number.

24.   Write a Shell Script to print the contents of the file from given line numbers to next given

number line.

25.   Write a Shell Script to print the pattern

1

2   2

3   3   3

4   4   4   4

Course Code 20UITE53P	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	H	H	H	H	H	H	H	H	M	-
CO2	H	H	H	H	H	H	H	H	M	-
CO3	H	M	H	H	H	H	H	H	H	-
CO4	H	M	H	H	M	H	H	H	L	-
CO5	H	L	H	H	H	H	M	M	H	-

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Head of the Department   Course Designer

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VIRUDHUNAGAR - 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 –21 onwards)

Semester V	**PROJECT**	Hours/Week: 0
Project		Credits: 1
Course Code **20UITC5PR**		Internal : 100 Marks

COURSE OUTCOMES

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

CO1:   apply fundamental concepts and methods to identify and solve technical problems.[K3]

CO2:   develop the ability to look into industrial problem and implement a secure and reliable information system. [K3]

CO3:   identify the characteristics of various stages of projects to provide technology based conclusion. [K3]

CO4:   organize team management to complete the project on time and work effectively as a member or a leader of a team. [K3]

CO5:   discover the software development process models to present technical report for lifelong learning. [K4]

Students are expected to select a project in the field of Information Technology and related interdisciplinary fields. Two students can do one project. Minimum pages for project report should be 20 pages. Two typed copies of the report on the completed project will be submitted to the Controller of Examination through the Head of the department in the month of November during V semester. Evaluation will be done internally.

Project work & Report   -   60 marks

Presentation & Viva-voce   -   40 marks

Course Code 20UITC5PR	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	H	H	H	H	H	H	H	M	H	-
CO2	H	H	H	H	H	H	M	H	M	-
CO3	M	H	H	H	H	M	H	H	H	-
CO4	M	H	H	H	M	H	M	H	H	-
CO5	H	M	H	H	M	H	H	M	M	-

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Head of the Department

Dr.(Mrs).A.Bharathi Lakshmi

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B.Sc. INFORMATION TECHNOLOGY

(2020 –21 onwards)

Semester V		Hours/Week: -	
Extra Credit Course	**COMPUTER ORGANIZATION**	Credits: 2	
Course Code		Internal	External
20UITO51		100	-

COURSE OUTCOMES

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

CO1:   Learn and identify the main concepts, key technologies of computer organization and control memory functions to strong their foundation. [K1]

CO2:   Recognize the architecture and infrastructure of Computer Registers, Parallel Processing and peripheral devices to design the real-time system. [K2]

CO3:   Identify the importance of computer arithmetic, pipelining, Direct Memory Access, design of control unit for data flow efficiency for the system. [K3]

CO4:   Criticize the key aspects and evolution of Memory hierarchy to enhance their skill in current technical concepts and practices. [K4]

CO5:   Discriminate the challenges faced by the in interrupts, Asynchronous Data Transfer, Instruction Formats and Addressing Modes that supports in lifelong learning. [K5]

UNIT I

Basic Computer Organization and Design: Instruction codes – Computer Registers – Computer Instructions – Timing and Control – Instruction cycle – Memory Reference Instructions – Input / Output and Interrupt.

Microprogrammed Control: Control Memory – Address Sequencing – Microprogram Example – Design of Control Unit.

UNIT II

Central Processing Unit: Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.

UNIT III

Pipeline and Vector Processing: Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction pipeline. **Computer Arithmetic:** Introduction – Addition and Subtraction – Multiplication Algorithms.

UNIT IV

Input / Output Organization: Peripheral Devices – Input/output Interface – Asynchronous Data Transfer – Priority Interrupt – Direct Memory Access (DMA).

UNIT V

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary memory – Associative Memory – cache Memory - Virtual Memory.

TEXT BOOK

Computer System Architecture, M.Morris Mano, Third Edition,(Twelfth Impression),PEARSON.

UNIT	CHAPTER	SECTION
I	5, 7	5.1 - 5.7, 7.1-7.4
II	8	8.1 - 8.7
III	9, 10	9.1 – 9.4, 10.1 – 10.3
IV	11	11.1-11.3, 11.5, 11.6
V	12	12.1-12.6

REFERENCE BOOKS

1. Computer Organization and Architecture, William Stallings, Prentice Hall of India New Delhi, 2008.

2.Computer Organization, V.Carl Hamacher, Z.G. Vranesic, S G Zaky, McGraw Hill, Fifth Edition, 2005.

3.Hardware and Computer Organization**,** Arnold S. Berger,Fifth Edition,2005

Course Code 20UITO51	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	H	M	H	L	M	M	L	M	M	-
CO2	H	H	L	M	H	L	-	L	M	L
CO3	H	L	H	M	L	L	M	H	-	L
CO4	H	H	M	L	H	H	M	L	L	H
CO5	H	H	M	L	H	H	M	M	-	-

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Head of the Department   Course Designer

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VIRUDHUNAGAR - 626 001

B.Sc. INFORMATION TECHNOLOGY (SEMESTER)

(2020 – 21 onwards)

Semester VI		Hours/Week: 5	
Core Course – 9	**JAVA PROGRAMMING**	Credits: 5	
Course Code		Internal	External
20UITC61		25	75

COURSE OUTCOMES

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

CO1 : recall the basic concepts of oops and Java Programming Concepts, creating an array and threads, defining an interface for gaining strong foundation on Java Programming to upgrade their skills and adapt to new technologies. [K1]

CO2 : outline the benefits of oops, java tokens, symbolic constants, evaluation of expressions, the switch statement, constructors, vectors, implementing interfaces creating packages, threads and exceptions, an applet for designing the real-time web applications to acquire imminent technologies through the foundation skills. [K2]

CO3 : develop java programming implementing operator precedence, conditional operator's, inheritance, interfaces, package, synchronization, user defined exceptions, streams classes, applet for developing web pages to execute projects efficiently. [K3]

CO4 : analyze overriding methods, type casting, wrapper classes, and java API packages, thread priority, building applet code, the graphics and stream classes in java programs to transform innovative ideas into real time projects. [K4]

CO5 : measure type conversions in expressions, finalizer methods, and system packages, thread exception, passing parameters to applets, graphics programming, and file classes to implement a secure and reliable file communication system. [K5]

UNIT I

   Fundamentals of Object Oriented Programming: Introduction – Object Oriented Paradigm – Basic Concepts of OOPS – Benefits of OOP – Applications of OOP.

   Java Evolution: Java History – Java Features – How Java differs from C and C++ – Java and Internet – Java and World Wide Web.

Overview of Java Language: Introduction – Simple Java Program – More of Java – An Application with two classes – Java Program Structure – Java Tokens – Java Statements – Java Virtual Machine – Command Line Arguments.

Constants, Variables and Data Types: Introduction – Constants – Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants – Type Casting – Getting Values of Variables – Standard Default values.

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

Decision Making and Branching: Introduction – Decision Making with If Statement – Simple If Statement – The if ….. Else Statement – Nesting of If … Else Statements – The Else If Ladder – The Switch Statement – The ? : Operator. (15 Hours)

UNIT II

Decision Making and Looping: Introduction – While Statement – do Statement – for statement – Jumps in Loops – Labeled Loops. **Classes, Objects and Methods:** Introduction – Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Method Overloading – Static Members – Nesting of methods – Inheritance: Extending a class – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Methods with Varargs – Visibility Control.

(12 Hours)

UNIT III

Arrays Strings and Vectors: Introduction – One-Dimensional Arrays – Creating an Array – Two-Dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

Interfaces: Multiple Inheritance: Introduction – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Packages: Putting Classes Together: Introduction – Java API Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import. (17 Hours)

UNIT IV

Multithreaded Programming: Introduction – Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Method – Thread Exception – Thread Priority – Synchronization – Implementing the 'Runnable' Interface. **Managing Errors and Exceptions:** Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions – Using Exceptions for Debugging.   (16 Hours)

UNIT V

Applet Programming: Introduction – How Applet Differ from Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML file – Running the Applet – More About Applet Tag – Passing Parameters to Applets – Aligning the Display – More About HTML Tags – Displaying Numerical Values – Getting Input from the User.

Graphics Programming: Introduction – The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.

Managing Input/ Output Files in Java: Introduction – Concept of Streams – Stream Classes – Byte Stream Classes – Character Stream Classes – Using Streams – Other useful I/O Classes – Using the File Class – Input/ Output Exceptions – Creation of Files – Reading/ Writing Characters – Reading/Writing Bytes – Handling Primitive Data Types – Concatenating and Buffering Files.

                                                                                    (15 Hours)

TEXT BOOK

Balagurusamy, E. (2015). *Programming with Java : A Primer*, Fifth Edition, New Delhi : Tata McGraw-Hill Education.

UNIT	CHAPTER	SECTION
I	1 - 6	1.1-1.5, 2.1-2.5, 3.1-3.7, 3.10, 3.11, 4.1-4.11, 5.1-5.15, 6.1-6.8
II	7 - 8	7.1-7.6, 8.1-8.18
III	9, 10, 11	9.1–9.8, 10.1–10.5, 11.1-11.10
IV	12, 13	12.1-12.10, 13.1-13.7, 13.9
V	14, 15, 16	14.1-14.16, 15.1-15.9, 16.1-16.14

REFERENCE BOOKS

1. Daniel Liang, Y. (2011). *Introduction to Java Programming*, Eighth Edition, Delhi : Pearson Higher Education.

2. Patrick Naughton, Herbert Schildt, (2002). *Java 2 – The Complete Reference*, Fifth Edition, New Delhi: Tata McGraw Hill.

3. Dr.Somasundaram, (2013). *Introduction to Java Programming*, India: Jaico Publishing House.

Course Code 20UITC61	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	H	L	M	M	M	H	H	M	L	L
CO2	H	M	M	M	M	H	M	H	L	L
CO3	H	M	M	M	H	H	M	H	L	L
CO4	H	M	M	H	H	H	H	M	L	L
CO5	M	M	H	M	H	H	H	M	L	L

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VIRUDHUNAGAR – 626 001

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

Semester VI	PHP and MySQL	Hours/Week: 5	
Core Course 9		Credits: 5	
Course Code **22UITC61**		Internal	External
		25	75

COURSE OUTCOMES

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

CO1: demonstrate server-side, client-side scripting techniques, variables, branching, HTTP , arrays and the purpose of a database able to apply particular scripting techniques as per the requirements of users**.** [K1]

CO2: complete the dynamic web pages using basic functions of PHP, types in PHP, functions and variable scope, multidimensional arrays and supported databases technologies through designing the real-time applications. [K2]

CO3: outline the PHP programming concepts in deciding on a web application platform,, control structures and functions, string handling functions for developing web applications. [K3]

CO4: summarize about server-side scripting, control structures and functions, PHP number handling, passing information with PHP, Structured Query Language connectivity using PHP programs. [K4]

CO5: measure the advantages of server-side Scripting, alternate control syntaxes, PHP super global arrays, inspecting arrays ,privileges and security for developing various database tasks in Web applications through PHP programs. [K5]

UNIT I

PHP and MySQL: PHP –MySQL – Deciding on a Web Application Platform.

Server-Side Scripting Overview: Static HTML – Client-Side Technologies – Server-Side

Scripting –Advantages of Server-Side Scripting.

Learning PHP Syntax and Variables: PHP is Forgiving – HTML is not PHP – PHP's Syntax is C – Like – Comments – Variables – Types in PHP – Type Summary – The Simple Types – Output. (15 Hours)

UNIT II

Learning PHP Control Structures and Functions: Boolean expressions – Branching– Looping – Alternate Control Syntaxes – Terminating Execution – Using Functions – Function Documentation – Defining own Functions – Functions and Variable Scope –Function, Scope.

(12 Hours)

UNIT III

Passing Information with PHP: HTTP is Stateless – GET Arguments – A Better use for GET – Style URL's – POST Arguments – Formatting form Variables – PHP Super Global Arrays.

Learning PHP String Handling: Strings in PHP – String Functions. **(17 Hours)**

UNIT IV

Learning Arrays: The uses of Arrays –PHP Arrays – Creating Arrays – Retrieving Values – Multidimensional Arrays – Inspecting Arrays – Deleting from Arrays – Iteration.

Learning PHP Number Handling: Numerical Types – Mathematical Operators – Simple Mathematical Functions – Randomness. **(16 Hours)**

UNIT V

Introducing Databases and MySQL: Database – Purpose of a Database – PHP Supported Databases – Focus:MySQL.

Learning Structured Query Language (SQL): Relational Databases and SQL –SQL Standards – The Workhorses of SQL – Database Design – Privileges and Security.

Integrating PHP and MySQL: connecting to MySQL – Making MySQL Queries – Fetching Data Sets – Getting Data about Data – Multiple Connections – Building in Error Checking – Creating MySQL Databases with PHP – MySQL Functions. **(15 Hours)**

TEXT BOOK

Steve Suehring, Tim Converse, and Joyce Park,*PHP6 and MySQL Bible,* Wiley, INDIA.

UNIT	CHAPTER
I	1, 2, 4
II	5
III	6, 7
IV	8, 9
V	11, 13,15

REFERENCE BOOKS

1. Luke Welling,Laura Thomson,*PHP MySQL Web Development*, Pearson, 5thEdition.
2. VikramVaswani,*How to Do everything with PHP and MySQL,* McGraw-Hill/Osborne.
3. Alan Forbes, (2015). *The Joy of PHP: A Beginner's Guide to programming Interactive Web Applications with PHP & MySQL,* Create Space Independent Publishing Platform.

Course Code 22UITC61	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	H	L	M	M	M	H	H	M	L	L
CO2	H	M	M	M	M	H	M	H	L	L
CO3	H	M	M	M	H	H	M	H	L	L
CO4	H	M	M	H	H	H	H	M	L	L
CO5	M	M	H	M	H	H	H	M	L	L

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B.Sc. INFORMATION TECHNOLOGY

(2020 – 21 onwards)

Semester VI	**Block Chain Technology**	Hours/Week: 5	
Core Course10		Credits: 5	
Course Code		Internal	External
20UITC62		25	75

COURSE OUTCOMES

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

CO1 : outline the basic concepts, architecture, technology and the primitives of the distributed computing and cryptography related to block chain to pursue higher studies. [K1]

CO2 : demonstrate the secure hash function algorithm, working of blockchain components and elements of trust in a block chain validation, verification and consensus for a reliable information system. [K2]

CO3 : implement Ethereum blockchain contract and apply the learning of solidity and decentralized apps in blockchain technology to solve computational problems in real world. [K3]

CO4 : analyze the blockchain and its allied technology, the working of smart contracts and decentralized system and robotic process automation to transform innovative ideas into reality. [K4]

CO5 : Evaluate security, privacy, transactions, and efficiency of a given blockchain system for better system performance. [K5]

UNIT I

Basics of Blockchain: Introduction-Concept of Blockchain- History-Definition of Blockchain - Fundamentals of Blockchain- Characteristics of Blockchain - Consensus in Trust - Building Exercise - Public, Private, and Hybrid Blockchains - Distributed Ledger Technologies - DLT Decentralized Applications and Databases - Architecture of Blockchain – Transactions - Chaining Blocks - Value Proposition of Blockchain Technology.   (15 Hours)

UNIT II

Decentralized System: Introduction - Distributed Decentralized Databases - Decentralized Enterprise – Decentralization - Disintermediation - Decentralized Enterprise Regulation.

Hash Functions: Introduction – Hashing - Message Authentication Code - Secure Hash Algorithms (SHA-1) - Secure Hash Algorithm Version 3 - Distributed Hash Tables - Hashing and Data Structures - Hashing in Blockchain Mining. (16 Hours)

UNIT III

Consensus: Introduction- Consensus Approach-Consensus Algorithms- Byzantine Agreement Methods.

Blockchain Components: Introduction – Ethereum – History- Ethereum Virtual Machine-Working of Ethereum - Ethereum Clients - Ethereum Key Pairs - Ethereum Addresses - Ethereum Wallets - Ethereum Transactions - Ethereum Languages - Ethereum Development Tools.

(15 Hours)

UNIT IV

Cryptography: Introduction – Cryptography - Cryptography Primitives - Symmetric Cryptography - Asymmetric Cryptography.

Smart Contracts: Introduction - Smart Contracts - Absolute and Immutable - Contractual Confidentiality - Law Implementation and Settlement – Characteristics - Internet of Things.

(12 Hours)

UNIT V

Decentralized Applications: Introduction - Today's Web Applications Requirement - Blocks Validation and Identification - Mining Hardware - Mining Software - Running Miner Software - Executing Several Miners - Swarm - Robotic Possibilities - Sidechain Hopping - Blockchain Forks.

Blockchain and Allied Technologies: Blockchain and Cloud Computing - Characteristics of Blockchain Cloud - Blockchain and Artificial Intelligence - Blockchain and IoT - Blockchain and Machine Learning - Blockchain and Robotic Process Automation.

[17 Hours]

TEXT BOOK:

Blockchain Technology: Concepts and Applications, Kumar Saurabh, Ashutosh Saxena, Wiley Publications, 2020.

UNIT	CHAPTERS	SECTIONS
I	1	1.1 – 1.14
II	2,3	2.1 – 2.6 3.1 – 3.8
III	4,5	4.1 – 4.4 5.1 – 5.12
IV	6,7	6.1 – 6.5 7.1 – 7.7
V	9,11	9.1, 9.2, 9.4, 9.6 – 9.9, 9.12 – 9.15 11.1 – 11.6

REFERENCE BOOKS:

1.   Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

2.   Chandramouli Subramanian, Asha A George , Abhilash K A , Meena Karthikeyan, Blockchain Technology Paper back, Universities Press (19 August 2020).

3.   D. Drescher, Blockchain Basics. Apress, 2017.

Course Code 20UITC62	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	H	M	H	L	H	H	H	H	L	-
CO2	H	H	H	L	H	H	H	H	-	-
CO3	H	H	H	L	H	H	H	H	-	-
CO4	H	M	H	L	H	H	H	H	-	-
CO5	H	M	H	L	H	H	H	H	-	-

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B.Sc. INFORMATION TECHNOLOGY

(2020– 2021 onwards)

Semester VI		Hours/Week: 5	
Core Course – 11	**COMPUTER NETWORKS**	Credits: 5	
Course Code		Internal	External
20UITC63		25	75

COURSE OUTCOMES

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

CO1: acquire network types, components, problems, services, protocols and design issues of each layer in reference models to design reliable information communication system. [K1]

CO2: outline the types of transmission media, elementary protocols, routing algorithms, error control and flow control to solve technical problems in industry. [K2]

CO3: identify the functionalities of DNS, core knowledge of TCP, IP, collision free protocols& Email to build real time applications. [K3]

CO4: analyze the characteristics of data unit, Multiple Access Protocols, Service Primitives, and IP addresses for additional security to meet security issues. [K4]

CO5: measures network types, mode of transmission, network standards, Architecture and Services, communication protocol for better system performance. [K5]

UNIT I

Introduction: Network Hardware – Network Software – Reference Models – The OSI Reference Model – The TCP/IP Reference Model.

The Physical Layer: Guided Transmission Media – Wireless Transmission.

The Data Link Layer: Data Link Layer Design Issues. (16 Hours)

UNIT II

The Data Link Layer: Error Detection and Correction – Elementary Data Link Protocols – Sliding Window Protocols – A One-Bit Sliding Window Protocol – A Protocol using Go-Back N.

The Medium Access Control Sub layer: The Channel Allocation problem – Multiple Access Protocols – ALOHA - Carrier Sense Multiple Access Protocol - Collision – Free protocols.

(12 Hours)

UNIT III

The Network Layer: Network Layer Design Issues – Routing Algorithms: Shortest Path Algorithm, Flooding, Distance vector routing – Link state Routing - Hierarchical Routing – Broadcast Routing– The Network Layer in the Internet –The IP Version 4 Protocol – IP ddresses – Prefixes – Subnets.   (17 Hours)

UNIT IV

The Transport Layer: The Transport Service – Services Provided to Upper Layers – Transport Service Primitives – Berkeley Sockets – Elements of Transport Protocols – Addressing – Connection Establishment – Connection Release – Error control and Flow control – Internet Transport Protocols – Introduction to TCP – The TCP protocol – TCP segment header – TCP Connection establishment – TCP connection release.   (15 Hours)

UNIT V

The Application Layer: DNS – The Domain Name System – The DNS Name Space – Domain Resource Records – Name Servers – ElectronicMail – Architecture and Services – The User Agent – Message Formats – MessageTransfer – Final Delivery.   (15 Hours)

TEXT BOOK

Andrew S. Tanenbaum, David J. Wetherall, (2011), *Computer Networks*, Pearson Education Inc, 5th Edition.

UNIT	CHAPTER	SECTION
I	1, 2,3	**Chap 1:1,2,3,4(4.1,4.2,4.4)** **Chap 2:2,3** **Chap 3: 1**
II	3,4	**Chap 3:2, 3, 4(4.1, 4.2)** **Chap 4:1, 2 (2.1, 2.2, 2.3)**
III	5	**Chap 5:1, 2(2.2 – 2.7),6(6.1,6.2 (up to subnets))**
IV	6	**1(1.1-1.3), 2(2.1 – 2.4), 5(5.1,5.3,5.4,5.5,5.6)**
V	7	**1, 2**

REFERENCE BOOKS

1. William Stallings, (2007),*Data and Computer Communications*, Pearson Education, Eighth Edition.

2. James F. Kurose,*Computer Networking – A Top-Down Approach*, Pearson Intl. 6th Edition.

3. BehrouzForouzan,*Data Communications and Networking*,McGraw Hill, 4th edition.

Course Code 20UITC63	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	H	M	H	L	H	M	H	M	L	-
CO2	H	M	H	L	H	H	H	M	-	-
CO3	H	M	H	L	H	M	H	M	-	-
CO4	H	M	H	L	H	H	H	M	-	-
CO5	H	M	H	L	H	H	H	M	-	-

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B.Sc. INFORMATION TECHNOLOGY

(2020-21 onwards)

Semester VI		Hours/Week: 5	
Core Practical – 6	**JAVA PROGRAMMING LAB**	Credits: 2	
Course Code		Internal	External
20UITC61P		40	60

COURSE OUTCOMES

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

CO1: attain the concepts of classes and objects to enhance their oops concepts skills. [K3]

CO2: improves code readability, reusability by the concepts of function overloading and inheritance to solve various problems in IT effectively and professionally. [K3]

CO3: apply multithreading for Program responsiveness, Utilization of Multiprocessor Architecture to solve various computing problems. [K3]

CO4: implement data encapsulation and provide controlled access with packages and provide functionality to import resources such as images, GUI controls, audio clips based on URLs by applets. [K4]

CO5: measures the basic applications, GUI application, web applications handling runtime errors using Exception to transform innovative ideas into real time projects. [K4]

Using Class and Object concept

18. Write a Java program to find

i) Largest number

ii) Small numbr

19. Write a Java program to find sum of digits

Using Function Overloading and Constructors

20. Write a Java program to find the volume of different shapes.

Using Decision making and branching

21. Write a Java program to check whether the given number is prime, perfect, adam, armstrong.

Using Array Concepts

22. Write a Java program for Matrix Manipulation

23. Write a Java program to sort the names in alphabetical order

Using Inheritance

24. Write a Java program for student details

25. Write a Java program for Employee details

26. Write a Java program to Implement multiple inheritance using interface for payroll processing

Using Multithreading

27. Write a Java program to perform multiplication table and sum of digit.

28. Write a Java program to check whether the number is odd or even

Using Exception

29. Write a Java program to perform Any 3 Built in Exception

30. Write a Java program to implement User defined Exception

Using Package

31. Write a Java program to perform Arithmetic operation.

Using Applet

32. Write a Java program to Animate a Face

33. Write a Java program to design a Traffic signal

Using AWT/Event Handling

34. Write a Java program to find volume of different shapes.

Course Code 20UITC61P	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	H	H	H	H	H	H	H	M	M	L
CO2	H	H	H	H	H	H	M	H	M	L
CO3	H	M	H	M	H	H	M	H	H	L
CO4	M	M	H	H	M	H	M	H	H	L
CO5	L	M	H	H	L	M	L	M	H	L

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V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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Re-accredited with 'A' Grade (3rd Cycle) by NAAC

VIRUDHUNAGAR - 626 001

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

Semester VI		Hours/Week: 5	
Core Practical 6	**WEB DESIGN USING PHP LAB**	Credits: 2	
Course Code		Internal	External
22UITC61P		40	60

COURSE OUTCOMES

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

CO1: demonstrate the client side and server-side scripting techniques and be able to apply particular scripting techniques as per the requirements of users**.** [K3]

CO2: complete the dynamic web pages using server-side scripting and the basic function of PHP as well as uses of open source technologies through designing the real-time applications. [K3]

CO3: outline the PHP programming concepts and looping to develop web applications using Meta characters, images, frames and regular expressions including modifiers. [K4]

CO4: summarize about the database handling and connectivity using MySQL and Create PHP programs that use various PHP library functions, and that manipulate files and directories. [K5]

CO5: develop various database tasks in Web applications through PHP programs and Build an application to construct various queries in MYSQL and implement the connectivity to the database. [K6]

Lab Exercises

Write a PHP Programme to

1. Design a Resume using form

2. Design a Mark statement using table

3. Count the occurrence of a number with its position using a while loop.

4. Perform number manipulation using switch-case.

5. Calculate simple interest using function.

6. Generate Fibonacci series using recursive functions.

7. Calculate NCR, using the includes command to include the factorial function.

8. Perform string manipulations.

9. Demonstrate all array operations.

10. Perform various Mathematical operations

11. Create a database for bank transactions using MYSQL connectivity.

12. Perform student mark list processing using MYSQL connectivity.

13. Design Employee pay bill form in HTML & process using MYSQL connectivity.

14. Create library details using MYSQL connectivity

15. Create Inventory details using MYSQL connectivity

Course Code 20UITC41P	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	H	H	H	H	H	H	H	M	M	L
CO2	H	H	H	H	H	H	M	H	M	L
CO3	H	M	H	M	H	H	M	H	H	L
CO4	M	M	H	H	M	H	M	H	H	L
CO5	L	M	H	H	L	M	L	M	H	L

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B.Sc. INFORMATION TECHNOLOGY

(2020 -21 onwards)

Semester VI		Hours/Week: 4	
DSEC 3		Credits: 4	
Course Code **20UCAE61**	**MOBILE APPLICATION DEVELOPMENT**	Internal 25	External 75

COURSE OUTCOMES

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

CO1 : recite the concepts of Android programming basics, Activities, Fragments, Intents, UI, Views, inserting pictures, menus and data persistence. [K1]

CO2 : interpret about Android basics, Activities, Fragments, Intents, UI, Views, apps with pictures, menus and data storage in memory card, Databases. [K2]

CO3 : identify the needed views to design the UI and use Activities, Fragments, intents, picture insertion, menu, Data storage in Android Apps. [K3]

CO4 : figure out the elements needed for the UI designing such as views, menu, images and combine the concepts such as activities, fragment, intent and data persistence. [K4]

CO5 : design simple Android Apps using Android basics, Activities, Fragments, Intents, UI, Views, pictures, menus and data persistence. [K5]

UNIT I

Getting Started with Android Programming: What is Android - Obtaining the Required Tools **– Activities, Fragments and Intents:** Understanding Activities - Linking Activities using Intents – Fragments – Calling Built-in Applications using Intents - Displaying Notification.

(12 Hours)

UNIT II

Getting to know the Android User Interface: Understanding the Components of a screen - Adopting to Display Orientation - Managing Changes to Screen Orientation – Utilizing the Action Bar – Creating the User Interface Programmatically - Listing for UI Notifications.

(12 Hours)

UNIT III

Designing your screen interface using Views: Using Basic Views – Using Picker Views – Using List Views to display Long Lists – Understanding Specialized Fragments.

(12 Hours)

UNIT IV

Displaying Picture and Menus with Views: Using Image Views to display pictures - Using Menu with Views - Some Additional Views. (12 Hours)

UNIT V

Data Persistence: Saving and Loading User Preferences - Persisting Data to Files - Creating and using Databases. (12 Hours)

TEXT BOOK

Wei - Meng Lee, *Beginning Android 4 Application Development*, Wiley India Pvt. Ltd. 2015.

UNIT	CHAPTER
I	1,2
II	3
III	4
IV	5
V	6

REFERENCE BOOK

1. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, *Mobile Computing*, Second Edition, Tata McGraw Hill Education, 2010.

2. Frank Ableson W, Robi Sen, Chris King, Enrique Ortiz C, *Android in Action*, Third Edition, Dreamtech Press, 2015.

3. Jerome Dimarzio J F, *Android A Programmers Guide*, McGraw Hill Education, 2015.

17th Academic Council Meeting 31.01.2023

Course Code 20UCAE61	PO1			PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	M	M	M	-	-	-	-	-	-	-
CO2	M	M	M	M	M	-	-	-	-	-
CO3	M	M	M	M	M	L	L	M	L	-
CO4	H	M	L	H	M	L	L	M	L	-
CO5	H	H	L	-	-	-	-	H	L	L

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Head of the Department   Course Designer

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B.Sc. INFORMATION TECHNOLOGY
(2020 – 2021 onwards)

Semester VI		Hours/Week: 4	
DSEC 3	**CYBER SECURITY**	Credits: 4	
Course Code		Internal	External
20UITE62		25	75

COURSE OUTCOMES

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

CO1: observe the security concepts, preventions, tools, control systems and basic approaches in information security. [K1]

CO2: summarize the firewall categories, types of IDPS, physical security controls and understand risk management and security maintenance model for the development of secured communication system. [K2]

CO3: implement firewall Architectures, IDPS detection methods, management maintenance models, technical aspects of information security to provide technology based conclusions. [K3]

CO4: select the Right Firewall, IDPS Approaches and Products, various risk assessments and apply the technological aspects for computational problems. [K4]

CO5: measure the effectiveness of IDPSs, the need for project management, internal & external environment and analyze real-life security cases. [K5]

UNIT I

Security Technology: wireless, VPNs ad Firewalls: Introduction – Access Control – Identification – Authentication – Authorization – Accountability – Firewalls – Firewall Processing Modes – Firewalls Categorized by Generation – Firewalls Categorized by Structure – Firewall Architectures – Selecting the Right Firewall – Configuring and Managing Firewalls – Content Filters. (12 Hours)

UNIT II

      Security Technology: Prevention Systems, Intrusion Detection and Other Security Tools: Introduction – Intrusion Detection and Prevention Systems – IDPS Terminology – Use of IDPS – Types of IDPS – IDPS Detection Methods – IDPS Response Behavior – Selecting IDPS Approaches and Products – Strengths and Limitations of IDPSs – Deployment and Implementation of an IDPS – Measuring the Effectiveness of IDPSs – Honeypots, Honeynets and Padded Cell Systems – Trap-and-Trace Systems – Active Intrusion Prevention.   (10 Hours)

UNIT III

      Securing Physical Assets: Introduction – Physical Access Controls – Physical Security Controls – Fire Security and Safety – Fire Detection and Response – Failure of Supporting Utilities and Structural Collapse – Heating, Ventilation and Air Conditioning – Power Management and Conditioning – Water Problems – Structural Collapse – Maintenance of Facility Systems – Interception of Data – Mobile and Portable Systems – Remote Computing Security – Special Considerations for Physical Security – Inventory Management.   (15 Hours)

UNIT IV

      Implementing Information Security: Introduction – Information Security Project Management – Developing the Project Plan – Project Planning Considerations – Scope Considerations – The need for Project Management – Technical Aspects of Implementation – Conversion Strategies – The Bull's-Eye Model – To Outsource or Not – Technology Governance and Change Control – Nontechnical Aspects of Implementation – The Culture of Change Management – Considerations for Organizational Change – Information systems Security Certification and Accreditation – Certification versus Accreditation – NIST SP 800-37, Rev. 1: Guide for Applying the Risk Management Framework to federal Information Systems: A Security Life cycle Approach – NSTISS Instruction-1000: National Information Assurance Certification and Accreditation Process (NIACAP) – ISO 27001/27001 Systems certification and Accreditation.

      (13 Hours)

UNIT V

      Maintenance of Information Security Discovery: Introduction – Security Management Maintenance Models – NIST SP 800-100 Information Security Handbook: A Guide for Manages

– The Security Maintenance Model – Monitoring the External Environment – Monitoring the Internal Environment – Planning and Risk Assessment.   (10 Hours)

TEXT BOOK

Michael Whitman, E.,Herbert Mattord, J. (2003). *Principles of Information Security*, 4th edition, Delhi : Cengage Learning India Pvt. Ltd.

UNIT	CHAPTER	PAGE NO.
I	6	237 – 270
II	7	281 – 318
III	9	383 - 412
IV	10	415 - 446
V	12	487 - 528

REFERENCE BOOKS

1. MayankBhushan, Rajkumar Singh Rathore, AatifJamshed, (2017).*Fundamentals of Cyber Security,* First Edition, New Delhi : BPB Publications.

2. Don Franke, (2016). *Cyber Security Basics: Protect Your Organization by Applying the Fundamentals*, California :CreateSpace Independent Publishing Platform.

3. James Graham, Rick Howard, Ryan Olson, (2010). Cyber Security Essentials, Florida: CRC Press.

Course Code 20UITE62	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	H	M	H	L	M	M	H	M	L	-
CO2	H	M	H	L	H	H	H	M	L	-
CO3	H	H	H	L	H	H	H	H	-	-
CO4	H	M	H	L	H	H	H	H	-	-
CO5	H	M	H	L	H	H	H	H	-	-

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VIRUDHUNAGAR – 626 001
B.Sc. INFORMATION TECHNOLOGY
(2020-2021 onwards)

Semester VI		Hours/Week: 4	
DSEC 3	**EMBEDDED SYSTEMS**	Credits: 4	
Course Code		Internal	External
20UITE63		25	75

COURSE OUTCOMES

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

CO1: list the Hardware, Software, design technologies, Microcontrollers and program modeling concepts used in designing Embedded Systems to acquire the knowledge of the components of Information Technology. [K1]

CO2: outline the Embedded System architecture, design process, Microcontrollers, designing C, C++ and Java programs that gain ability to familiarize the latest trends in technological development. [K2]

CO3: identify the features of the microcontrollers and provide the exact solutions for any embedded applications that helps in applying standard Software Engineering practices. [K3]

CO4: analyze suitable microcontroller along with appropriate interfacing circuits and implement with software programs that enhances the practice in the core information technologies of human computer interaction. [K4]

CO5: determine the key concepts of embedded systems such as I/O, interrupts and interaction with peripheral devices through software to carry out societal IT projects. [K5]

UNIT I:

Introduction to Embedded Systems: Embedded System – Processor Embedded into a System – Embedded Hardware Units and Devices in a System – Embedded Software in a System and an Overview of Programming Languages – Introduction to Embedded-system Design – Introduction to Embedded-system Architecture – Introduction to Embedded-system Model – Classification of Embedded Systems – Skills required for an Embedded-system Designer – Examples of the Embedded Systems.

Embedded Systems Design and Development Process: Embedded System-On-Chip(SoC) and use of VLSI Circuit – Complex System Design and Processors. (10 Hours)

UNIT II

Embedded Systems Design and Development Process: Build Process in Embedded Systems – Design process in Embedded System – Design Challenges in Embedded-System Design – Challenges in Embedded-System Design: Optimizing the Design Metrics – Challenges and Issues related to Embedded-Software Development – Embedded-System Design Technologies – Formalism of System Design – Design Process and Design Examples.

I/O Devices, Communication Buses and Distributed Networked Embedded Architectures:I/O types and Examples – Serial Communication Devices – Timer and Counting Devices. (15 Hours)

UNIT III

8051, AVR and ARM Microcontrollers, Real-World Interfacing and the Inputs and Outputs using Buses: Introduction to Microcontrollers and Microprocessors – Embedded versus External Memory Devices – Example of a Microcontroller–8051 Architecture – ATMEL AVR Microcontroller – ARM Microcontrollers – Computer-system Buses – Real-World Interfacing – I/O performance – I/O Buses – Network-Oriented Bus Arbitration – Buses – Multilevel Buses.

(10 Hours)

UNIT IV

Programming Concepts and Embedded Programming in C, C++ and Java: Programming in Assembly Language and in High Level Language 'C' – 'C' Program Elements: Header and Source Files and Preprocessor Directives – Program Elements: Macros and Functions – Program Elements: Data Types, Data Structures, Modifiers, Statements, Loops and Pointers – Use of Loops, Infinite Loops and Conditions – Use of Function Calls – Multiple Function Calls in Cyclic Order – Function Pointers and Function Queues – Queuing of Functions on Interrupts and Interrupt-Service-Routine Queues. (10 Hours)

UNIT V

Programming Concepts and Embedded Programming in C, C++ and Java: Embedded C and C++: Overview of Additional Features – Object Oriented Programming – Embedded Programming in C++ – Optimisation of Codes and Memory Needs in Embedded C++ Programs to Eliminate the Disadvantages – Embedded Programming in Java.

Program Modeling Concepts: Program Models – Data-Flow Graph-Based Program Models – State-Machine Programming Models for Event-Controlled Programs – Modeling of Multiprocessor Systems – UML Modeling. (15 Hours)

TEXT BOOK

Raj Kamal, (2017) *Embedded Systems Architecture, Programming and Design*, Third Edition, New Delhi: McGraw Hill Education Private Limited.

UNIT	CHAPTER	SECTION
I	1	Full
	2	2.1, 2.2
II	2	2.3 – 2.11
III	3	Full
	5	5.1, 5.2, 5.6
IV	7	7.1 – 7 .9
V	7	7.10 – 7.14
	8	Full

REFERENCE BOOKS

1. Wayne Wolf, *Computers as Components: Principles of Embedded Computing System Design*, Second Edition, New Delhi: Tata McGraw Hill Publications.

2. Frank Vahid, Tony Givargis, *Embedded System Design: A Unified Hardware/Software Introduction*, Second Edition, New Delhi: Tata McGraw Hill Education Publications.

3. Peter Marbell, *Embedded System Design*, Second Edition, New York: Springer Publications.

Course Code 20UITE63	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	H	M	M	H	M	L	H	M	L	L
CO2	H	H	L	H	M	M	M	H	L	L
CO3	H	H	H	M	H	H	H	M	L	L
CO4	H	H	L	M	H	M	H	M	L	L
CO5	H	H	M	H	H	H	M	M	L	L

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VIRUDHUNAGAR – 626 001

B.Sc. INFORMATION TECHNOLOGY

(2020 -21 onwards)

Semester VI		Hours/Week: 4	
DSEC 4	**MOBILE APPLICATION DEVELOPMENT LAB**	Credits: 2	
Course Code		Internal	External
20UCAE61P		40	60

COURSE OUTCOMES

On successful completion of the course, the learners should be able to

CO1 : identify the packages, classes and methods needed for the problem. [K3]

CO2 : make use of views, menu, images to design UI and write programs using activities, fragment, intent and data persistence. [K3]

CO3 : key-in the programs and test the programs with required input and get expected outputs with neat formatting and prepare the record work. [K3]

CO4 : explain the UI design, activities in App and deduce the answers for any queries raised. [K3]

CO5 : reconstruct the program to adapt the necessary modifications and justify the desired result. [K4]

1.   Create an App for String Manipulation using Radio Button view.

2.   Create an App to list text suggestions using Auto Complete Text View.

3.   Create an App to display progress value of seek bar.

4.   Create an App to display star rating using Rating Bar.

5.   Design an App for Image Gallery using Button View.

6.   Design an App for Image Transition Effect.

7.   Create an App to fill a shape using Gradient color.

8.   Create an App for NCR calculation.

9.   Create an App for Fibonacci Series

10.   Create an App to implement different types of animation using XML.

11.   Changing Background and Text Color of a TextView.

12.   Create an App to display Date Picker Dialog.

13.   Create an App to display Time Picker Dialog.

14.   Create an App for Menu creation.

15.   Create an App to display notifications.

16.   Create an App to display Alert Dialog.

17.   Create Applications using SQLite database

Course Code 20UCAE61P	PO1		PO2	PO3		PO4		PO5	PO6	PO7
	PSO 1.a	PSO 1.b	PSO 2	PSO 3.a	PSO 3.b	PSO 4.a	PSO 4.b	PSO 5	PSO 6	PSO 7
CO1	H	M	M	-	-	-	-	-	-	-
CO2	H	M	M	M	M	-	-	-	-	L
CO3	M	M	L	H	M	L	L	M	-	L
CO4	M	-	L	M	-	L	L	M	L	-
CO5	-	M	L	-	-	-	-	H	L	-

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B.Sc. INFORMATION TECHNOLOGY
(2020– 21 onwards)

Semester VI		Hours/Week:4	
DSEC 4	**UML DESIGNING LAB**	Credits: 2	
Course Code **20UITE62P**		Internal 40	External 60

COURSE OUTCOMES

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

CO1: organize, design, document the requirements through Use Case driven approach to present multiple views of a system. [K3]

CO2: model the event driven state of objects and transform them into implementation specific layouts. [K3]

CO3: develop class diagrams and object diagrams that model the design model and design solution using creative patterns to effectively share and communicate the vision orally among users. [K3]

CO4: choose the structural and behavioral patterns for a given application and verify the elements of UML to solve design problems in the IT environment. [K3]

CO5: analyze the subsystem, various components and its notations for recording design artifacts to meet desired needs for efficient system design. [K4]

List of Programs:

1. Study of Case Diagram of UML
2. Implementation of ATM Processing System
3. Course Registration System
4. Sales and Marketing System
5. Inventory Tracking System
6. Hospital Information System
7. Bank Processing System

8. Library Management System

9. Online Ticket Reservation System

10. Implementation of object orientation in Hotel System

Course Code 20UITE62P	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	M	M	H	H	H	M	H	M	L	-
CO2	M	H	H	M	H	H	M	M	-	-
CO3	M	H	H	H	H	H	H	M	-	-
CO4	M	H	H	H	H	H	M	M	-	-
CO5	M	H	H	H	H	H	M	M	-	-

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B.Sc. INFORMATION TECHNOLOGY

(2020 – 2021 onwards)

Semester VI		Hours/Week: 4
DSEC 4	**R PROGRAMMING LAB**	Credits: 2
Course Code		Internal	External
20UITE63P		40	60

COURSE OUTCOMES

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

CO1 : utilize the R language syntax including control statements, loops and functions to write programs for a wide variety of real world problems in mathematics and research field. [K3]

CO2 : apply the control structures like looping and conditional statements in R to store, process and sort the data in easier manner. [K3]

CO3 : interpret the concepts of arrays and vectors in R to implement sorting and searching problems to enhance their knowledge. [K3]

CO4 : discover the capabilities of R data expression for data verification and Recursion procedure for building performance efficient R programs. [K3]

CO5 : analyze the different packages in R language to manipulate the large set of data that will improve their lifelong learning. [K4]

1. R Program to Add Two Vectors

2. Find Sum, Mean and Product of Vector in R Programming

3. R Program to Generate Random Number from Standard Distributions

4. R Program to Find Minimum and Maximum of n numbers

5. R Program to Sort a Vector

6. R Program to Find the Factorial of a Number

7. R Program to print Multiplication Table

8. R Program to Check Prime Number/ Armstrong Number

9. R Program to Print the Fibonacci Sequence

10. R Program to Check for Leap Year

11. Check if a Number is Odd or Even in R Programming

12. R Program to Check if a Number is Positive, Negative or Zero

13. R Program to Find the Sum of Natural Numbers

14. R program to Find the Factorial of a Number Using Recursion

15. R Program to Find the Factors of a Number using function

16. Fibonacci Sequence / Sum of Natural Numbers Using Recursion in R

17. R Program to Find H.C.F. or G.C.D.

18. R Program to Make a Simple Calculator

19. Data Manipulation with dplyr package

20. Data Manipulation with data.table package

21. Study and implementation of Data Visualization with ggplot2

22. Study and implementation data transpose operations in R.

Course Code 20UITE63P	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	H	H	H	H	H	H	H	M	H	-
CO2	H	H	M	H	H	H	M	H	M	-
CO3	M	M	H	H	H	M	M	M	H	-
CO4	M	M	H	H	M	H	M	M	M	-
CO5	L	L	H	H	M	H	L	M	H	-

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B.Sc. INFORMATION TECHNOLOGY
(2020 – 2021 onwards)

Semester VI		Hours/Week: 2	
SEC Practical – 4	**PYTHON PROGRAMMING LAB**	Credits: 2	
Course Code		Internal	External
20UITS61P		40	60

COURSE OUTCOMES

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

CO1 : utilize the Python language syntax including control statements, loops and functions to write programs for a wide variety problem in mathematics, science, and games to enhance their learning. [K3]

CO2 : apply the core data structures like lists, dictionaries, tuples and sets in Python to store, process and sort the data in efficient manner. [K3]

CO3 : interpret the concepts of Object-oriented programming as used in Python such as encapsulation, polymorphism and inheritance to solve the real world problems. [K3]

CO4 : discover the capabilities of Python regular expression for data verification and utilize matrices for building performance efficient Python programs that helpful their research work. [K3]

CO4 : analyze the external modules for creating and writing data to excel files and inspect the file operations to navigate the file systems to enhance their knowledge. [K4]

1. Write a Python program to illustrate the various functions of math module.

2. Write a program that reads an integer value and prints "leap year" or "not a leap year"

3. Write a menu driven program to calculate the area of given building. Accept suitable inputs and use suitable assertions.

4. Write a Python function that takes a number as an input from the user and computes its factorial.

5. Write a Python function to generate the Fibonacci sequence till a given number "n".

6. Write a function that takes a number as an input and finds its reverse and computes the sum of its digits.

7.   Write a function that takes two numbers as input parameters and returns their least
          common multiple.

8.   Write a function that takes a number as an input and determine whether it is prime or not.

9.   Write a Python function that prints a dictionary where the keys are numbers between 1
          and 5 and the values are cubes of the keys.

10.   Write a program to implement a class for finding area and perimeter of a rectangle.

11.   Write constructor, destructor, and functions for calculating area and perimeter.

12.   Write a Python program to perform the following using list:

    a. Check if all elements in list are numbers or not

     b. If it is a numeric list, then count number of odd values in it

    c. If list contains all Strings, then display largest String in the list

    d. Display list in reverse form

    e. Find a specified element in list

    f. Remove the specified element

13.   Implementation of Linear and binary search techniques

14.   Implementation of selection sort, insertion sort, and bubble sort techniques

15.   Perform the following file operations using Python

     a) Traverse a path and display all the files and subdirectories in each level till the deepest

    level for a given path. Also, display the total number of files and subdirectories.

     b) Read a file content and copy only the contents at odd lines into a new file.

16.   Devise a Python program to implement the Hangman Game.

Course Code 20UITS61P	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	H	H	H	H	H	H	H	M	H	-
CO2	H	H	H	H	H	H	M	H	M	-
CO3	M	H	H	H	H	M	M	M	H	-
CO4	M	M	H	H	M	H	M	H	M	-
CO5	L	L	H	H	M	H	L	M	M	-

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