

(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
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UG PROGRAMMES

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

PG PROGRAMMES

Arts & Humanities	:	History, English, Tamil
Physical & Life Sciences	:	Mathematics, Physics, Biochemistry, Home Science - Nutrition and Dietetics, 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 – PG

- 1. Core Courses
- 2. Project
- Elective Courses
 3.1 Discipline Specific Elective Courses (DSEC)
 3.2 Non Major Elective Course (NMEC)
- 4. Online Course Practice for SET/NET General Paper
- 5. Extra Credit Courses (Optional)

List of Non Major Elective Courses (NMEC) Offered

PG PROGRAMMES

Name of the Course	Semester	Department
History of Freedom Movement in India	III	History
(A.D. 1885 - 1947)		
English for Job Aspirants	III	English
தமிழும் பிறதுறைகளும்	III	Tamil
Taxation Concepts and Assessment	III	Commerce
Entrepreneurship	III	Business Administration
Mathematics for Competitive	III	Mathematics
Examinations		
Digital Electronics	III	Physics
Chemistry for Competitive Examinations	III	Chemistry
Apiculture	III	Zoology
Nutrition and Health	III	Home Science - Nutrition and Dietetics
Clinical Biochemistry	III	Biochemistry
Web Programming	III	Computer Science
Fundamentals of Information Technology	III	Information Technology
Web Technology	III	Computer Applications

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 predetermined 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 channelise their teaching methodologies and evaluation strategies to attain the Programme Educational Objectives (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 fulfill 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 offer an in depth knowledge of the subject.
- To groom the graduates with good attitude, team work and personality skills
- To promote original inquiry and innovations.
- To co-ordinate knowledge, skills and attitude towards successful career.
- To impart moral, ethical and social responsibilities to students

B.1.1 Programme Educational Objectives (PEOs)

PEOs are broad statements that describe the career and professional achievements that the Programme is preparing the graduates to achieve within the first few years after graduation. PEOs are framed for each Programme and should be consistent with the Mission of the Institution.

Programme Educational Objectives (PEOs) of M.Sc. Information Technology Programme

The students will be able

- **PEO 1** to impart exhaustive knowledge to the students in all the sub-domains of Information Technology areas.
- **PEO 2** to design & develop novel products and innovative solutions for real life problems in Information Technology field and related domains.
- **PEO 3** to provide a conductive and disciplined Academic environment, quality of teaching with innovative & modern methods with necessary technical and managerial skills to attain a successful carrer.

	Programme Educational			
Key Components of the Mission Statement	Objectives (PEOs)			
	PEO 1	PEO 2	PEO 3	
Uplift Rural Students	\checkmark	\checkmark	\checkmark	
Enhance employability opportunity	\checkmark	\checkmark		
Provide moral values to turn out to be a responsible	./		./	
citizen	v		v	
Develop graduates to meet the challenges of the	./	./		
rapidly changing world	V	v		

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 their in depth domain knowledge and practical skills in interdisciplinary fields for research-based endeavours, employment and entrepreneurship development. (*Disciplinary Knowledge*)
- 2 communicate proficiently and confidently with the ability to present complex ideas in a concise manner to assorted groups. (*Communication Skills*)
- *3* identify, formulate and solve problems in a consistent and systematic way with updated skills using modern tools and techniques. (*Scientific Reasoning and Problem Solving*)
- 4 analyze the data, synthesise the findings and provide valid conclusion by critical evaluation of theories, policies and practices for the betterment of society. (*Critical Thinking and Analytical Reasoning*)
- 5 explore and evaluate globally competent research methodologies to apply appropriately in interdisciplinary research; Develop and sustain the research capabilities to meet the emerging needs for the welfare of the society. (*Research Related Skills*)
- 6 use ICT to mould themselves for lifelong learning activities to face career challenges in the changing environment. (*Digital Literacy, Self directed and Lifelong Learning*)
- 7 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*)
- 8 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 PG Programme. Programme Specific Outcomes denote what the students would be able to do at the time of graduation. They are Programm e-specific and it is mandatory that each PO should be mapped to the respective PSO.

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

PO 1: Disciplinary Knowledge

PSO 1:apply their in-depth knowledge and skills to succeed in their professional development or to pursue flexible career paths amidst future technological changes.

PO 2: Communication Skill

PSO2 a: enhance skills and adapt new computing technologies for attaining professional excellence and carrying research in IT.

PSO2 b:communicate concepts, designs, and solutions in Information Technology effectively and professionally.

PO 3: Scientific Reasoning and Problem Solving

PSO 3:apply knowledge of computing to produce effective designs and solutions for specific real time problems in the field of Information Technology.

PO 4: Critical Thinking and Analytical Reasoning

PSO 4:analyze the latest technologies and synthesize computing systems through quantitative and qualitative techniques to solve problems in the areas of Information Technology for sustainable environment.

PO 5: Research Related Skills

PSO 5:acquire future technologies through the foundation skills and knowledge and employ them to identify research gaps and pursue research.

PO 6: Digital Literacy, Self - Directed and Lifelong Learning

PSO 6 .a:adapt new technologies and constantly upgrade their skills with an attitude towards lifelong learning in the fields of their interest.

PSO 6.**b**: emphasis on mobile and web applications development and learn the emerging technologies and frameworks in demand with employers and contemporary challenges.

PO 7: Cooperation/Team Work

PSO 7:plan, design and execute projects effectively in diverse teams for the development of intelligent systems with a focus on the future.

PO 8: Moral Ethical Values

PSO 8:uphold the social, legal, ethical and cultural ramifications of computer technology and their usage.

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	PEO 1	PEO 2	PEO 3
POs/PSOs			
PO1/PSO1	~	~	~
PO2/PSO2	~	~	~
PO3/PSO3	~	✓	√
PO4/PSO4	~	√	~
PO5/PSO5	~	√	~
PO6/PSO6	~	√	~
PO7/PSO7	~	\checkmark	-
PO8/PSO8	-	√	-

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 toany 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, 2 and 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	PO8/ PSO8
CO1								
CO2								
CO3								
CO4								
CO5								

ELIGIBILITY FOR ADMISSION

Candidate for admission to the M.Sc. (Information Technology) Course (Full Time) should possess a Bachelors Degree of Information Technology, Computer Science or BCA of this University or as an Examination accepted as equivalent there to, with a minimum aggregate of 45% marks in Part III subjects other than languages and mathematics subject as ancillary.

DURATION OF THE PROGRAMME

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

MEDIUM OF INSTRUCTION

English

B.2 EVALUATION SCHEME

Components	Internal Assessment Marks	External Examination Marks	Total Marks
Theory	40	60	100
Project	60	40	100

B.2.1 Core Courses, Discipline Specific Elective Courses & Non Major Elective Course INTERNAL ASSESSMENT

Distribution of Marks

Theory

Mode of E	Evaluation		Marks
Periodic Test		:	25
Assignment	K5 Level	:	5
Seminar		:	10
	Total	:	40

Three Periodic Tests- Average of the best two will be consideredTwo Assignments- Better of the two 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

Duration: 2 Hours

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Max. Marks
A Q.No.(1 - 5)	Multiple Choice Questions	5	5	1	5
B Q.No.(6-10)	Internal Choice - Either Or Type	5	5	5	25
C Q.No.(11&12)	Internal Choice - Either Or Type	2	2	10	20
			,	Fotal	50 *

Question Pattern for Periodic Test

*The total marks obtained in the Periodic Test will be calculated for 25 marks

EXTERNAL EXAMINATION

Question Pattern

Duration: 3 Hours

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Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks		
A Q.No.(1 - 5)	Multiple Choice Questions	5	5	1	5		
B Q.No.(6-10)	Internal Choice- Either Or Type	5	5	5	25		
C Q.No.(11-13)	Internal Choice - Either Or Type	3	3	10	30		
Total							

B.2.2 Project

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Project is compulsory for II PG Students in IV Semester.

Distribution of Marks

Mode of Evaluation		Marks
Internal Assessment	:	60
External Examination	:	40
Total	:	100

Evaluation Pattern (100 marks)

Internal Assessment (60marks)				External Asse	ssment (40 marks)			
One Periodic Test Project Pre-Submission One Open online				Project	Viva Voce			
(20)	Report	Presentation	Course related to	Presentation	(10)			
	(20)	(10)	the Project (10)	(30)				

B.2.3 Online Course

Practice for SET/NET - General Paper

Internal Examination only

- Online Test with Multiple Choice Questions will be conducted in III Semester.
- Model Examination will be 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

B.2.4 Extra Credit Courses (Optional)

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

Section	Types of Question	No. of Questions	No. of Questions to be answered	Marks for each Question	Total Marks
A Q. No.(1- 4)	Open Choice	15	10	5	50
B Q. No.(5)	Internal Choice (Either-or Type)	5	5	10	50
				Total	100

B.2.5 Extra Credit Courses

- Two credits are allotted for each Extra Credit Course offered by the Department.
- Extra credits are allotted for the completion of Open Online Courses offered by MOOC to the maximum of 15 credits.
 - The Courses shall be completed within the first III Semesters of the Programme.
 - > The allotment of credits is as follows

4 weeks Course	- 1 credit
8 weeks Course	- 2 credits
12 weeks Course	- 3 credits

ELIGIBILITY FOR THE DEGREE

- The candidate will not be eligible for the Degree without completing the prescribed Courses of study and a minimum of 50% Pass marks in all the Courses.
 - > No Pass minimum for Internal Assessment for other Courses.
 - Pass minimum for External Examination is 27 marks out of 60 marks for Core Courses, Discipline Specific Elective Courses and Non Major Elective Course.
 - > Pass minimum for Practice for SET/NET General Paper is 50 Marks.
- Attendance
 - The students who have attended the classes for 76 days (85%) and above are permitted to appear for the Summative Examinations without any condition.
 - 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.
 - 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.
 - 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.</p>
 - 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.

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

Attainment Levels of COs

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

Percentage of Attainment=	Number of Students who scored more than the Target				
	Total Number of Students	A 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 curricularactivities.

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

PO Assessment Tools

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Average Direct PO Attainment									
Direct PO Attainme	ent in								
percentage									

Programme Articulation Matrix (PAM)

Indirect Attainment of POs for all Courses

Pos	PO1	PO2	PO3	PO4	PO5	PO6	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

Extra curricular 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 3 years of completion of the Programme only through Indirectmethods.

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



	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

Expected Level of Attainment for each of the Programme Educational Objectives

Level of PEO Attainment

Graduation Batch	Overall PEO Attainment	Whether Expected Level of
	(in percentage)	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 Programmeare defined, refined and are inscribed in the form of PEOs. The level of attainment of PEOs defined earlier will be analysedand 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 recommendappropriate 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 M.Sc. Programme.



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MASTER OF INFORMATION TECHNOLOGY (7021)

Programme Structure - Allotment of Hours and Credits

For those who join in the Academic Year 2020-2021

Components		Semester					
	I	II	III	IV	Number of Hours/ (Credits)		
Core Course	5 (5)	5 (5)	6 (5)	6 (5)	22 (20)		
Core Course	5 (5)	5 (5)	6 (5)	-	16 (15)		
Core Course	5 (5)	5 (5)	-	-	10 (10)		
Core Course Practical	5 (3)	5 (3)	6 (3)	6(3)	22 (12)		
Core Course Practical	5(3)	5(3)	6 (3)	6(3)	22(12)		
Discipline Specific Elective Course	5 (5)	5 (5)	-	-	10 (10)		
Non Major Elective Course	-	-	5 (4)	-	5 (4)		
Online Course	-	-	1 (1)	-	1 (1)		
Project	-	-	-	12(6)	12(6)		
Total	30 (26)	30 (26)	30 (21)	30 (17)	120 (90)		
Extra Credit Course(Optional)	-	-	0(2)	-	0(2)		
-offered by the Department							
Extra Credit Course(Optional)	-	-	-	-	Limited to a		
-MOOC					maximum of 15 credits		



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VIRUDHUNAGAR - 626 001

M.Sc. INFORMATION TECHNOLOGY Programme Code - 7021

PROGRAMME CONTENT

SEMESTER I

S.No.	Components	ts Title of the Course Course Hours Credits Exam.		Marks		S			
			Code	per Week		Hours	Int.	Ext.	Total
1	Core Course 1	Data Structures and Algorithms	20PITC11	5	5	3	40	60	100
2	Core Course 2	Advanced Java Programming	20PITC12	5	5	3	40	60	100
3	Core Course 3	Cryptography and Network Security	20PITC13	5	5	3	40	60	100
4	Core Practical 1	Data Structures using C Pointers Lab	20PITC11P	5	3	3	40	60	100
5	Core Practical 2	Advanced Java Programming Lab	20PITC12P	5	3	3	40	60	100
6	DSEC-1	Distributed Operating Systems/	20PITE11						
		Cloud Computing/	20PITE12	5	5	3	40	60	100
		TCP/IP Protocols	20PITE13						
	L	30	26			1	600		

S.	Common on ta	Title of the Course	Course	Title of the Course Hours		Creadita	Exam.		Mark	ŝ
· NO	Components	The of the Course	Code	per Week	Creans	Hours	Int.	Ext.	Total	
1	Core Course 4	Distributed Database Systems	20PITC21	5	5	3	40	60	100	
2	Core Course 5	Artificial Intelligence	20PITC22	5	5	3	40	60	100	
3	Core Course 6	Mobile Applications Development	20PITC23	5	5	3	40	60	100	
4	Core Practical 3	Mobile Applications Lab	20PITC21P	5	3	3	40	60	100	
5	Core Practical 4	.Net Lab	20PITC22P	5	3	3	40	60	100	
6	DSEC 2	Internet Of Things/	20PITE21							
		Data Mining /	20PITE22	5	5	3	40	60	100	
		Advanced Software Engineering /	20PITE23							
	Total								600	

M.Sc. INFORMATION TECHNOLOGY - SEMESTER II

M.Sc. INFORMATION TECHNOLOGY - SEMESTER III

C No	Components	Title of the Course	Course	Hours	Creadita	Exam.		Mark	KS
5.INO.			Code	per Week	Creatts	Hours	Int.	Ext.	Total
1	Core Course 7	Python Programming	20PITC31	6	5	3	40	60	100
2	Core Course 8	Information Security	20PITC32	6	5	3	40	60	100
3	Core Practical 5	Python Programming Lab	20PITC31P	6	3	3	40	60	100
4	Core Practical 6	Network Programming Lab	20PITC32P	6	3	3	40	60	100
5	NMEC	Fundamentals of Information Technology	20PITN31	5	4	3	40	60	100
6 Online Course Practice for SET/NET – General Paper		20PGOL31	1	1	-	100	-	100	
			Total	30	21				600

DSEC: Discipline Specific Elective Course

NMEC – Non Major Elective Course

Extra Credit Course

- * The extra credit courses are optional one.
- * The mode of evaluation is only by internal examination for a maximum of 100 Marks.

EXTRA CREDIT COURSES OFFERED IN III SEMESTER

5	Sl.No	Component	Title of the Paper	Code	Credits	Exam Hours	Total Marks
	1	Extra Credit Course – 1	Software Project Management	20PITO31	2	3	100

M.Sc. INFORMATION TECHNOLOGY - SEMESTER IV

S.No.	Components	ts Title of the Course	Course Code	Hours	Credits	Exam.		Mark	S
				Week	creates	Hours	Int.	Ext.	Total
1.	Core Course 9	Big Data Analytics	20PITC41	6	5	3	40	60	100
2.	Core Practical 7	R Programming Lab	20PITC41P	6	3	3	40	60	100
3.	Core Practical 8	Software Testing Lab	20PITC42P	6	3	3	40	60	100
4.	Core Course	Project	20PITC41PR	12	6	3	40	60	100
	Total				17				400

The Core Course & Core Practicals of the IV Semester are to be completed within the Month of January.

For Project & Viva Voce (IV Semester)

An individual project should be undertaken by every student either outside companies or within the college from the Month of February to April.



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VIRUDHUNAGAR - 626 001

M.Sc. INFORMATION TECHNOLOGY Programme Code - 7021 REVISED PROGRAMME CONTENT SEMESTER I

S.No.	Components	Title of the Course	Course	Hours	Credits	Exam.		Mark	KS .
			Code	per Week		Hours	Int.	Ext.	Total
1	Core Course 1	Data Structures and Algorithms	20PITC11	5	5	3	40	60	100
2	Core Course 2	Advanced Java Programming	20PITC12	5	5	3	40	60	100
3	Core Course 3	Cryptography and Network Security	20PITC13	5	5	3	40	60	100
4	Core Practical 1	Data Structures using C Pointers Lab	20PITC11P	5	3	3	40	60	100
5	Core Practical 2	Advanced Java Programming Lab	20PITC12P	5	3	3	40	60	100
6	DSEC-1	Distributed Operating Systems/	20PITE11						
		Cloud Computing/	20PITE12	5	5	3	40	60	100
		TCP/IP Protocols	20PITE13						
		·	Total	30	26		<u> </u>	-	600

S.	G	Title of the Comme	Course	Hours		Exam.		Mark	s
	Components	Title of the Course	Code	per Week	Credits	Hours	Int.	Ext.	Total
1	Core Course 4	Distributed Database Systems	20PITC21N	5	5	3	40	60	100
2	Core Course 5	Artificial Intelligence	20PITC22N	5	5	3	40	60	100
3	Core Course 6	Mobile Applications Development20PITC23N55		5	3	40	60	100	
4	Core Practical 3	Mobile Applications Lab	20PITC21PN	5	3	3	40	60	100
5	Core Practical 4	.Net Lab	20PITC22PN	5	3	3	40	60	100
6	DSEC 2	Internet Of Things/	20PITE21N						
		Data Mining /	20PITE22	5	5	3	40	60	100
		Advanced Software Engineering /	20PITE23						
			Total	30	26				600

M.Sc. INFORMATION TECHNOLOGY - SEMESTER II

M.Sc. INFORMATION TECHNOLOGY - SEMESTER III

C No	Common on to	Title of the Course	Course	Hours	Creadita	Exam.	Marks		
5.INO.	Components		Code	per Week	Creans	Hours	Int.	Ext.	Total
1	Core Course 7	Python Programming	20PITC31	6	5	3	40	60	100
2	Core Course 8	Information Security	20PITC32	6	5	3	40	60	100
3	Core Practical 5	Python Programming Lab	20PITC31P	6	3	3	40	60	100
4	Core Practical 6	Network Programming Lab	20PITC32P	6	3	3	40	60	100
5	NMEC	Fundamentals of Information Technology	20PITN31	5	4	3	40	60	100
6	Online Course	Practice for SET/NET – General Paper	20PGOL31	1	1	-	100	-	100
			Total	30	21				600

DSEC: Discipline Specific Elective Course

NMEC – Non Major Elective Course

Extra Credit Course

- * The extra credit courses are optional one.
- * The mode of evaluation is only by internal examination for a maximum of 100 Marks.

EXTRA CREDIT COURSES OFFERED IN III SEMESTER

Sl.No	Component	Title of the Paper	Code	Credits	Exam Hours	Total Marks
1	Extra Credit Course – 1	Software Project Management	20PITO31	2	3	100

S No	Components	Title of the Course	Course Code	Hours	Crodite	Exam.	Marks			
	Components		Course Coue	Week	Creuits	Hours	Int.	Ext.	Total	
5.	Core Course 9	Big Data Analytics	20PITC41	6	5	3	40	60	100	
6.	Core Practical 7	R Programming Lab	20PITC41P	6	3	3	40	60	100	
7.	Core Practical 8	Software Testing Lab	20PITC42P	6	3	3	40	60	100	
8.	Core Course	Project - Research Methodology								
		& Ethics	22PITC41PR	12	6	3	60	40	100	
	The Core Course	& Core Practicals of the IV Semester	are to be complete	d within th	Month o	f January.				
			Total	30	17				400	

M.Sc. INFORMATION TECHNOLOGY - SEMESTER IV

For Project & Viva Voce (IV Semester)

An individual project should be undertaken by every student either outside companies or within the college from the Month of February to April.

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

Semester I		Hours/W	eek: 5
Core Course-1	DATA STRUCTURES AND ALGORITHMS	Credits: :	5
Course Code 20PITC11		Internal 40	External 60

COURSE OUTCOMES

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

- CO1: elaborate the choice of data structures and concepts and types of Binary trees including properties, operations and traversal that impacts the performance of programs. [K2]
- CO2: apply the operations on non-linear structures, dynamic programming techniques to solve problems like Shortest path, Minimum Spanning tree, Knapsack and Travelling sales person to develop a reliable communication system. [K3]
- CO3: utilize the various operations on types of binary trees, Backtracking and Branch and Bound techniques to provide technology-based conclusions. [K3]
- CO4: examine application using non-linear data structure, backtracking methods and its representation to solve real world computational problems. [K4]
- CO5: summarize the various types of Binary trees, B-Tree and algorithmic concepts to be acquainted with the latest trends in technological development. [K5]

UNIT I

Introduction and Overview: Definition - Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures.

Trees: Basic Terminology - Definition and Concepts – Binary Trees – Properties of Binary Tree - Representation of Binary Tree – Linear Representation of a Binary Tree-Linked Representation of Binary Tree - Physical Implementation of Binary Tree in Memory – Operations on Binary Tree – Insertion – Deletion – Traversal – Merging of Two Binary Trees. (15 Hours)

UNIT II

Trees: Types of Binary Trees – Expression Tree – Binary Search Tree – HeapTrees –Threaded Binary Trees – Height Balanced Binary Tree, Red-Black tree, Splay tree- B-tree, B+ tree indexing.(20 Hours)

UNIT III

Graph: Introduction – Graph Terminologies – Representation of Graphs – Set Representation – Linked Representation – Matrix Representation – Operations on Graphs –Operations on Linked List Representation of Graphs – Operations on Matrix Representation of Graphs – Applications of Graph Structures – Shortest Path Problem – Topological Sorting– Minimum Spanning Trees – Connectivity in a Graph – Euler's and Hamiltonian Circuits. (15 Hours)

UNIT IV

Dynamic Programming General Method: All Pairs Shortest Path, Single SourceShortest Path, 0 / 1 Knapsack Problem, Reliability Design, Traveling Sales PersonsProblem.(15 Hours)

UNIT V

Back Tracking and Branch – and – Bound General Method: 8 – Queens

Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem. (10 Hours)

TEXT BOOKS

- 1. Samantha.D (2009). Classic Data Structures, PHI.
- 2. Ellis Horowitz, SartajSahni and Sanguthevar Rajasekaran, *Fundamentals of Computer Algorithms*, 2nd edition, University Press.

REFERENCE BOOKS

1. Chitra.A, Rajan.D.T. (2007). Data Structures, VNI Publication.

- 2.Seymour Lipschutz (2006). Data Structures, Mc-Graw Hill Companies.
- 3.Robert Lafore, *Data Structures and Algorithms in JAVA*, Second Edition, SAMS Publications

Course Code	PO1	Р	02	PO3	PO4	PO5	PO	D6	PO7	PO8
20PITC11	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	Н	L	М	М	М	L	-	L
CO3	Н	Н	Н	Н	Н	Н	Н	L	-	L
CO3	Н	Н	Н	Н	М	М	М	L	-	L
CO4	Н	L	Н	М	М	L	М	L	-	М
CO5	Н	М	Н	Н	Н	Н	Н	М	-	М

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.S.Rajapriya Course Designer



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

Semester I		Hours/W	eek: 5
Core Course-2	ADVANCED JAVA	Credits: :	5
Course Code	PROGRAMMING	Internal	External
20PITC12		40	60

COURSE OUTCOMES

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

- CO1: express object-oriented language of classes and objects, Event Classes, AWT Classes for attaining professional excellence. [K2]
- CO2: ascertain the knowledge of Multithreaded Programming, Event Listener Interfaces and Applet Architecture which influences the real-world project knowledge in an effective way. [K3]
- CO3: assign an Applet Skeleton, Swing, concept of JDBC, Remote Method Invocation, Bean Developer Kit for adopting the latest technologies and techniques to expand projects skill. [K3]
- CO4: characterize and manage Errors and Exception, Window Fundamentals. JApplet, URL Connection in an intelligent system with a great focus of research. [K4]
- CO5: appraise the concept of Frame Windows, Simple Applet Display Methods, GUI based, Database Connection, Result sets, Datagrams, Bean Builder for achieving and adopting new technologies to upgrade their skills constantly. [K5]

UNIT I

Classes, Objects and Methods – Interfaces: Multiple Inheritance – Packages:

Putting Classes Together — Managing Errors and Exception. (15 Hours)

UNIT II

Event Handling: Two Event Handling Mechanisms-The Delegation Event Model-Event Classes-Sources of Events.

Introducing the AWT: Working with windows, Graphics: AWT Classes-Window Fundamentals-Working with Frame Windows.

The Applet Class: Applet Basics-Applet Architecture-An Applet Skeleton-SimpleApplet Display Methods-Requesting Repainting-Using the Status window-The HTMLAPPLET Tag-Passing parameters to Applets-get Documentbase() and getCodeBase()-Applet Context and show Document().(20 Hours)

UNIT III

A Tour of Swing: JApplet-Icons and Labels-Text Fields-Buttons-Combo Boxes-Tabbed Panes-Scroll Panes-Trees-Tables-Exploring Swing`.

JDBC Objects: The concept of JDBC – JDBC Driver types – JDBC Packages – A Brief overview of the JDBC process – Database Connection – associating the JDBC/ODBC bridge with Database – Statement objects – Result sets. (15 Hours) UNIT IV

Java Remote Method Invocation: Remote Method Invocation Concept – Server side – Client side.

Networking:Networking Basics – Java and the Net-Inetaddress-TCP/IP ClientSockets-URL- URL Connection - Datagrams.(15 Hours)

UNIT V

Java Beans: What is a Java Bean? – Advantages of Java Beans – Application Builder Tools – Using the Bean Developer Kit (BDK) – JAR Files – Introspection – Developing a Simple Bean Using the BDK – Using Bound Properties – Using the Bean Info Interface – Constrained Properties – Persistence – Customizers – The Java Beans API – Using Bean Builder. (10 Hours)

TEXT BOOKS

- Balagurusamy.E (2012). *Programming with Java A Primer*, Fourth Edition, Tata Mc Graw Hill Education Private Limited.
- Herbert Schildt (2002). *The Complete Reference Java 2*, Fifth edition, PEARSON Education, Tata McGraw-Hill Publication.
- 3. Jim Keogh (2002). *The Complete Reference J2EE*, Tata Mc Graw Hill Education Private Limited.

REFERENCE BOOKS

- 1. Paul J.Deitel, Harvey M.Deitel (2009). *Internet & World Wide Web: How to Program*, Pearson Education International.
- Herbert Schildt (2007). Swing: A Beginner's Guide, Tata Mc Graw Hill Publishing Company Limited.
- 3. Steven Holzner et al (2002). Java 2 Programming Black Book, Dreamtech Press.

Course Code	PO1	PO1 PO2		PO3	PO4 PO5 PO6		PO7	PO8		
20PITC12	PSO 1	PSO 2. a	PSO 2. b	PSO 3	PSO 4	PSO 5	PSO 6. a	PSO 6. b	PSO 7	PSO 8
CO1	Н	Н	М	Н	М	L	М	М	-	М
CO2	Н	М	L	Η	М	L	Н	Η	-	L
CO3	Н	Η	Н	Η	Η	М	М	Η	-	М
CO4	Η	М	М	М	Η	М	L	М	-	L
CO5	Н	Η	Н	Н	Н	М	М	Η	-	М

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs. D.Shunmuga Kumari Course Designer



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VIRUDHUNAGAR - 626 001

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

		110015/ 11	eek. J
Core Course-3 Cl	RYPTOGRAPHY AND NETWORK SECURITY	Credits:	5
Course Code		Internal	External
20PITC13		40	60

COURSE OUTCOMES

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

- CO1: grasp the methods of conventional, modern and advanced encryption techniques, authentication mechanism, Digital signature schemes and layers level security to enhance their skills. [K2]
- CO2: implement the concepts of ciphering techniques, public key encryption(RSA), hash functions, key management and number theory to obtain data security and to develop intelligent system on their own. [K3]
- CO3: apply the various encryption and authentication algorithms, Hash functions and key distribution algorithms are used for network security over the internet. [K3]
- CO4: characterize the authentication mechanism for system, encryption mechanism for both data integrity and security which was used for real time projects and their research works. [K4]
- CO5: assess the different types of ciphering techniques, modern and advanced encryption algor used and the usage of hash functions, digital signature in network security. [K5]

UNIT I

Introduction: Security Goals – Attacks – Services and Mechanism – Techniques.

Traditional Symmetric – Key Ciphers: Introduction –Substitution Ciphers – Transposition Ciphers – Stream and Block Ciphers.

Introduction to Modern Symmetric Key Ciphers: Modern Block Ciphers. Data Encryption Standard (DES): Introduction – DES Structure – DES Analysis. (16 Hours) UNIT II

Advanced Encryption Standards (AES): Introduction – Transformations – KeyExpansion – Ciphers. Asymmetric Key Cryptography: Introduction – RSACryptosystem.(15 Hours)

UNIT III

Message Integrity and Message Authentication:Message Integrity – RandomOracle Model – Message Authentication.Cryptographic Hash Functions:Introduction– SHA-512 - WHIRLPOOL.(15 Hours)

UNIT IV

Digital Signature: Process – Attacks on Digital Signature – Digital SignatureSchemes – RSA Digital Signature Scheme – ElGamal Digital Signature Scheme – DigitalSignature Standard. Entity Authentication: Introduction – Passwords – Challenge –Response – Zero- Knowledge. Key Management: Symmetric- Key Distribution –Symmetric-Key Agreement – Public Key Distribution.(18 Hours)

UNIT V

Security at the Application Layer: PGP and S/MIME: E-Mail – PGP - S/MIME.

Security at the Transport layer: SSL AND TLS :SSL Architecture – Four Protocols – SSL Message Formats – Transport Layer Security. (11 Hours)

TEXT BOOK

Behrouz A. Forouzan (2015). *Cryptography and Network Security*, Special Indian Edition, Third Edition, TATA McGraw Hill Publishing Company Limited.

REFERENCE BOOKS

- 1. Bruce Schneier. (2002). *Applied Cryptography*, Second Edition, John Willey and Sons Publications.
- 2. Wenbo Mao. (2004). Modern Cryptography, First Edition, Pearson Education.

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 Roberta Bragg, Mark Rhodes, Keith Strassberg. (2004). Network Security, Tata McGraw Hill Edition.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC13	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Η	М	L	М	М	М	Н	М	-	L
CO2	Н	М	М	Н	М	Н	Н	М	-	М
CO3	Н	L	L	М	Н	М	М	Н	-	М
CO4	Н	Н	L	Н	Н	Н	Н	Η	-	М
CO5	Н	L	Н	Н	М	Н	М	Н	-	М

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.G.Chandraprabha Course Designer

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

Semester I		Hours/W	eek: 5
Core Practical-	DATA STRUCTURES USING C POINTERS	Credits:	3
Course Code 20PITC11P		Internal 40	External 60

COURSE OUTCOMES

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

- CO1: apply the basic structures such as arrays and linked list using pointers with the knowledge of course. [K3]
- CO2: implement the fundamental algorithms including tree traversals, BFS, DFS and shortest path by applying mathematical foundations in IT. [K3]
- CO3: demonstrate the implementation of various operations on linked list, stack and queue and thereby innovate new ideas by self-directed. [K3]
- CO4: point out the new algorithms or modify existing ones for new applications to achieve the target. [K4]
- CO5: assess various searching and sorting algorithms to apply current technical concepts and practices. [K5]

Lab Exercises

- 1. Implementing Data Structures Programs with Pointers concept.
- 2. Implementation of Heap Tree
- 3. Implementation of Tree Traversal
- 4. Implementation of BFS
- 5. Implementation of DFS
- 6. Implementation of Arithmetic Evaluation using Pointers

- 7. Implementation of Sparse Matrix.
- 8. Implementation of Shortest Path.
- 9. Implementation of Spanning Tree
- 10. Implementation of 8-Queens Problem.

- 11. Implementation of Travelling Salesman Problem
- 12. Implementation of Tower of Hanoi

Course Code 20PITC11P	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	Н	Н	Н	М	Η	Н	Η	М
CO2	Н	Н	Н	Н	Н	М	Н	Н	Н	М
CO3	Н	Н	Н	Н	М	Н	М	М	Η	М
CO4	Η	Н	Н	М	Н	Н	М	М	М	Η
CO5	H	М	Н	М	Н	H	L	М	М	H

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.S.Rajapriya Course Designer

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M.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester I		Hours/W	eek: 5	
Core Practical- 2	ADVANCED JAVA PROGRAMMING	Credits: 3		
Course Code	LAB	Internal	External	
20PITC12P		40	60	

COURSE OUTCOMES

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

- CO1: employ the object-oriented language and its usage of interfaces and packages for attaining professional excellence. [K3]
- CO2: manipulate the uses of databases connectivity which is included for real-world project domains knowledge of effective designs and solutions. [K3]
- CO3: apply the client/server applications and TCP/IP, UDP socket programming for the latest technologies and techniques to solve projects skill. [K3]
- CO4: investigate the distributed application using RMI, NET Beans effectively with intelligent systems with a focus of research. [K4]
- CO5: measure the various component-based java software using Java Beans and Apple effectively to achieve and adopt new technologies and constantly upgrade their skills. [K5]

Lab Exercises

- 1. Write a Java program to Prepare Hotel Bill Management using Interface
- 2. Write a Java program to Perform EB-Bill calculation using Package
- 3. Write a Java program to Prepare Student mark sheet preparation using database connectivity of ODBC
- 4. Write a Java program to Prepare Library book details using database connectivity of ODBC
- 5. Write a Java program to Prepare Employee pay bill details using database connectivity of Oracle
- 6. Write a Java program to Prepare Banking operations using database connectivity of Oracle
- 7. Write a Java program for sending messages from server to client using TCP/IP
- 8. Write a Java program for Sending messages from client to server using TCP/IP
- 9. Write a Java program for Chatting with same host using TCP/IP
- 10. Write a Java program for Chatting with different host using TCP/IP
- 11. Write a Java program for Sending messages from server to client using UDP
- 12. Write a Java program for Sending messages from client to server UDP
- 13. Write a Java program for Chatting with same host UDP
- 14. Write a Java program for Chatting with different host UDP
- 15. Write a Java program to perform String operations using Applet.
- 16. Write a Java program to perform Text formatting using Net Beans
- 17. Write a Java program to perform Image slide show using Image Slider
- 18. Write a Java program to perform Color Pallets using Swing.
- 19. Write a Java program to perform Arithmetic operations using RMI.
- 20. Write a Java program to perform Restart your own system using RMI.
- 21. Write a Java program to perform Shutdown a system in a Network using RMI.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC12P	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	б. а	6. b	7	8
CO1	Н	Η	Н	Н	М	Н	М	М	Н	М
CO2	Н	Н	М	Н	М	Н	Н	Н	Н	М
CO3	Н	Η	Н	Н	Η	Н	Н	Η	М	М
CO4	Н	Η	М	М	М	М	М	М	М	М
CO5	H	H	Η	H	М	М	М	Η	М	М

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.D.Shunmuga Kumari Course Designer



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

Semester I		Hours/Week: 5		
DSEC-1	DISTRIBUTED OPERATING	Credits: 5		
Course Code	SYSTEMS	Internal	Externa	
20PITE11		40	1	

COURSE OUTCOMES

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

- CO1: interpolate hardware and software issues dealt under Message Passing, Distributed Shared memory, Resource, Process and File managing systems that afford modern distributed systems knowledge. [K2]
- CO2: acquire knowledge on Distributed Computing, Synchronization, Shared Memory, Naming and Processing techniques that benefit to understand the theory of Distributed Systems. [K3]
- CO3: make use the concepts of distributed systems including Messaging, Processing, Memory and File systems to design large systems. [K3]
- CO4: explain a distributed system that fulfills requirements of Distributed Operating Systems such as Buffering, Replacement Strategy, Process Migration and File transactions to tackle industrial challenges. [K4]
- CO5: prescribe different Distributed Systems and the challenges involved in Memory, Process, Messages and File processing system to transform innovative ideas in reality. [K5]

UNIT I

Fundamentals: Distributed Computer System – Evolution of Distributed Computing Systems – Distributed Computing Systems Models –Distributed Computing Systems Gaining Popularity –Distributed Operating System – Issues in Designing a Distributed Operating System – Introduction to Distributed Computing Environment (DCE). (12 Hours)

UNIT II

Message Passing: Introduction – Desirable Features of a Good Message – Passing System – Issues in IPC by Message Passing – Synchronization – Buffering – Multi datagram Messages – Encoding and Decoding of Message Data – Process Addressing – Failure handling – Group Communication. (15 Hours)

UNIT III

Distributed Shared Memory: Introduction – General Architecture of DSM Systems – Design and implementation issues of DSM – Granularity – Structure of Shared Memory Space – Consistency Models – Replacement Strategy – Thrashing – Other Approaches to DSM Heterogeneous DSM – Advantages DSM. (18 Hours)

UNIT IV

Resource Management: Introduction – Desirable Features of a Good Global Scheduling Algorithm – Task Assignment Approach – Load-Balancing Approach – Load Sharing Approach.

Process Management: Introduction – Process Migration – Threads. (16 Hours) UNIT V

Distributed File System: Introduction – Desirable Features of a Good Distributed File System – File Models – File-Accessing Models – File Sharing Semantics – File Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles.

Naming:Introduction – DesirableFeatures of a Good Naming System –Fundamental Terminologies and Concepts – Systems-Oriented Names.(14 Hours)

TEXT BOOK

Pradeep.K.Sinha(2008). *Distributed Operating Systems Concepts and Design*, Prentice Hall of India Publications.

REFERENCE BOOKS

- 1. Andrews S.Tanenbaum, Distributed Operating Systems, First edition PHI.
- 2. Randy Chow, Theodore (2009). *Distributed Operating System and Algorithms and Analysis*, Pearson Education India.
- Doreen L. Galli (2000). Distributed Operating Systems Concepts and Design, Prentice Hall.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITE11	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	Н	М	М	Н	Н	L	М	L
CO2	Н	L	Н	Η	Н	Н	Н	L	М	М
CO3	Н	М	Н	Η	М	Н	Н	L	М	М
CO4	Н	М	Н	М	М	Н	Н	L	Н	М
CO5	Н	Н	Н	М	Н	Н	М	L	Н	L

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

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> M.Sc. INFORMATION TECHNOLOGY (2020 -2021 onwards)

Semester I		Hours/We	eek: 5	
DSEC-1	CLOUD COMPUTING	Credits: 5		
Course Code		Internal	Externa	
20PITE12		40	1	

COURSE OUTCOMES

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

- CO1: learn the main concepts, key technologies, strengths, and limitations of cloud computing to enhance their knowledge. [K2]
- CO2: apply the cloud computing paradigm of various types of cloud services such as software, platform, infrastructure, database of various service providers to find solutions for specific domain problems. [K3]
- CO3: experiment Cloud Computing capable data centers to real world based on their carrier. [K3]
- CO4: explain the architecture, infrastructure and delivery models of cloud computing to solve real world problem. [K4]
- CO5: determine the core issues of cloud computing such as security, privacy and interoperability for applying current technical concepts and practices. [K5]

UNIT I

Introduction : Cloud-definition, benefits, usage scenarios, History of Cloud Computing - Cloud Architecture - Types of Clouds - Business models around Clouds – Major Players in Cloud Computing - issues in Clouds - Eucalyptus - Nimbus - Open Nebula, Cloud Sim. (14 Hours)

UNIT II

Cloud Services: Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service providers- Google, Amazon, Microsoft Azure, IBM, Sales force. (18 Hours)

UNIT III

Collaborating using Cloud Services: Email Communication over the Cloud -CRM Management - Project Management-Event Management - Task Management -Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware. (16 Hours)

UNIT IV

Virtualization for Cloud: Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization –System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM -Hypervisors – Xen, KVM, VMWare, Virtual Box, Hyper-V. (12 Hours) UNIT V

Security, Standards and Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud. (15 Hours)

TEXT BOOKS

- John Rittinghouse& James Ransome (2010). Cloud Computing, Implementation, Management and Strategy, CRC Press.
- 2. Michael Miller (August 2008). *Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate*, Que Publishing.
- 3. James E Smith, Ravi Nair (2006). Virtual Machines, Morgan Kaufmann Publishers.

REFERENCE BOOKS

- 1. David E.Y. Sarna (2011), Implementing and Developing Cloud Application, CRC press.
- 2. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas (May 2011), *Draft cloud computing synopsis and recommendation*, NIST.
- 3. Anthony T Velte, Toby J Velte, Robert Elsenpeter (2010), *Cloud Computing : A Practical Approach*, Tata McGraw-Hill.

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 Haley Beard (July 2008), Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited.

Curriculum for M.Sc. Information Technology

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITE12	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
-	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	L	Н	М	М	L	L	-	L
CO2	Н	Н	М	L	М	М	Н	L	-	L
CO3	Н	L	L	L	Н	Н	L	Н	-	L
CO4	Н	М	L	М	L	L	М	L	-	L
CO5	Н	L	L	L	L	L	М	L	-	М

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



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VIRUDHUNAGAR - 626 001

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

Semester I		Hours/We	ek: 5
DSEC-1	TCP/IP PROTOCOLS	Credits: 5	
Course Code		Internal	External
20PITE13		40	60

COURSE OUTCOMES

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

- CO1: explain the protocols and its structure as well as to know about sub-netting, masking and demonstrate the functions of TCP and UDP to enhance the knowledge in digital networking and communication. [K2]
- CO2: illustrate the knowledge of basic protocols involved in routing, wired/wireless communication and acknowledging the methods of transmission to emphasis the techniques of different web browsers. [K3]
- CO3: apply the routing techniques, subnets, DNS, the broadcasting mechanism in the internet and application protocols that use the services of other layers to design the digital system. [K3]
- CO4: compare the performance of networking devices and different routing protocols such as IP, ICMP, TFTP etc., and communication protocol TCP and UDP to meet desired needs in real world. [K4]
- CO5: evaluate the methods of process-to-process communication and transmission methods in UDP, TCP and SMTP to solve computation problems. [K5]

UNIT I

IP: Internet Protocol: Introduction – IP Header – IP Routing – Subnet Addressing – Subnet Mask – Special case IP addresses – Subnet Example – ifconfig command – net stat command.

ARP: Resolution Protocol: Introduction – An Example – ARP cache – ARP packet format – ARP examples – Proxy ARP.

ICMP: Internet Control Message Protocol: Introduction – ICMP Messagetypes- ICMP Address Mask Request and Reply – ICMP Timestamp Request and Reply –ICMP Port Unreachable Error.(15 Hours)

UNIT II

IP Routing: Introduction – Routing Principles – ICMP Host and Network Unreachable Error – ICMP Redirect Errors – ICMP Router Discovery Messages.

TFTP: Trivial File Transfer Protocol and BOOTP: Introduction – Protocol –An Example – Security – BOOTP Packet Format – An Example – BOOTP Server Design– BOOTP Through a Router.(10 Hours)

UNIT III

TCP: Transmission Control Protocol: Introduction – TCP Services – TCP Header – TCP Connection Establishment and Termination – Time out of Connection Establishment – Maximum Segment Size – TCP Half-Close – TCP State Transition Diagram – Reset Segments – Simultaneous Open – Simultaneous Close – TCP Options.

TCP Interactive Data Flow and Bulk Data Flow : Introduction – Interactiveinput – Delayed acknowledgement – Nagle Algorithm – Window size Advertisement –Normal Data Flow – Sliding Windows – Window Size – PUSH Flag – Slow start – BulkData Throughput – Urgent Mode.(15 Hours)

UNIT IV

TCP Timeout and Retransmission: Introduction – Simple Timeout and Retransmission Example – Round-Trip Time Management – An RTT Example – Congestion Example – Congestion Avoidance Algorithm – Fast Retransmit and Fast Recovery algorithm – Congestion Example – Per-Route Metrics – ICMP Errors – Repacketization.

DNS: Domain Name System: Introduction – DNS Basics – DNS Message Format– A Simple Example – Pointer Queries – Resource Records – Caching – UDP or TCP –Another Example.(20 Hours)

UNIT V

FTP: File Transfer Protocol: Introduction – FTP Protocol – FTP Examples.

SMTP: Simple Mail Transfer Protocol: Introduction – SMTP Protocol – SMTP Examples – SMTP Futures.

SNMP: Simple Network Management Protocol: Introduction – Protocol – Structure of Management Information – Object Identifiers – Introduction to the Management Information Base – Instance Identification – Simple Examples – Management Information Base – Additional Examples – Traps.

Other TCP/IP Applications: Introduction – Finger Protocol – Who is Protocol – Archie, WAIS, Gopher, Veronica and WWW – X-Window System. (15 Hours)

TEXT BOOK

W.Richard Stevens &G.Gabrani(2006), *TCP/IP Illustrated Volume 1 – The Protocols*, Pearson Education.

REFERENCE BOOKS

- 1. Parker, *Guide yourself TCP/IP*, Second Edition Pearson Education.
- 2. KaranjitS.Siyan.(1997). Inside TCP/IP, Third Edition, Techmedia.
- 3. Douglas E.Comer.(2003). *Networking With TCP/IP Principles, Protocols, and Architectures*, Sixth Edition, Prentice Hall India.

Course Code	PO1	PO	PO2		PO4	PO5	PO6		PO7	PO8
20PITE13	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	М	Н	Н	М	М	Н	-	L
CO2	Н	Н	Н	Н	Н	Н	Н	М	-	L
CO3	Н	Н	Н	Н	М	М	М	L	-	L
CO4	Н	М	Н	М	М	L	М	L	-	L
CO5	Η	М	Н	Н	Н	Η	Н	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.K.Kasthuri Course Designer

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

Semester II		Hours/W	eek: 5	
Core Course-4	DISTRIPTED DATARASE SVSTEMS	Credits: 5		
Course Code	DISTRIBUTED DATADASE STSTEMS	Internal	External	
20PITC21		40	60	

COURSE OUTCOMES

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

- CO1: express fundamental concepts of distributed database, data fragmentations, transparencies, transactions, database security and recovery for attaining professional excellence. [K2]
- CO2: ascertain the knowledge of database design concepts, distributed database architecture, concurrency control and query Processing of data distribution features to solve the common memory problem in digital networking. [K3]
- CO3: utilize the different types of fragmentation, distributed data independence, timestampbased concurrency control protocols for compare the transaction concept in database that helps in life time learning. [K3]
- CO4: measure and manage multi-database system, local recovery protocols, phases in distributed query processing in an intelligent system with a great focus of research.[K4]
- CO5: evaluate the techniques of fragment allocation, locking-based concurrency control protocols, timestamp ordering (TO) algorithm, distributed INGRES algorithm, distributed R* algorithm SDD -1 algorithm is used to deal with committing a transaction that accesses databases stored on multiple nodes. [K5]

UNIT I

Distributed Database Concepts: Fundamentals of Distributed Database – Features of a Distributed DBMS – Advantages and Disadvantages Distributed DBMS – An example of Distributed DBMS - Homogeneous and Heterogeneous Distributed DBMS - Functions of Distributed DBMS - Components of a Distributed DBMS -Date's 12 Objectives S for Distributed Database Systems - Distributed Database Design.

Distributed Database Design Concepts: Alternative Approaches for Distributed Database Design.

Objectives of Data Distribution: Alternative Strategies for Data Allocation.

Data Fragmentation - Benefits of Data Fragmentation - Correctness Rules for Data Fragmentation – Different types of Fragmentation - The Allocation of Fragments – Measure of Costs and benefits for Fragment Allocation – Horizontal Fragments –Vertical Fragments. (10 Hours)

UNIT II

Transparencies in Disturbed Database Design: Data Distribution Transparency – Transaction Transparency – Performance Transparency – DBMS Transparency.

Distributed DBMS Architecture – Introduction – Client Server System -Advantages and Disadvantages of Client/Server System - Architecture of Client/Server Distributed Systems - Architectural Alternatives for Client/Server Systems - Peer-to-Peer Distributed System - Reference Architecture of Distributed DBMSs - Component Architecture of Distributed DBMSs - Distributed Data Independence - Multi-Database System (MDBS) – Five-Level Schema Architecture of federated MDBS - Reference Architecture of Tightly Coupled Federated MDBS - Reference Architecture of loosely Coupled Federated MDBS. (15 Hours)

UNIT III

Distributed Transaction Management - Basic Concepts of Transaction Management - ACID Properties of Transactions - Objectives of Distributed Transaction Management - A Model for Transaction Management in a Distributed System -Classification of Transactions.

Distributed Concurrency Control: Objectives of Distributed Concurrency Control - Concurrency Control Anomalies - Distributed Serializability - Classification of Concurrency Control Techniques - Locking-based Concurrency Control Protocols -Centralized 2PL- Primary Copy 2PL - Distributed 2PL - Majority Locking Protocol -Biased Protocol - Quorum Consensus Protocol.

Timestamp – Based Concurrency Control Protocols - Basic TimestampOrdering (TO) Algorithm - Conservative TO Algorithm - Multi-version TO Algorithm -Optimistic Concurrency Control Technique.(15 Hours)

UNIT IV

Distributed Recovery Management: Introduction to Recovery Management -Failures in a Distributed Database System - Steps Followed after a Failure - Local Recovery Protocols - Immediate Modification Technique - Shadow Paging – Check pointing and Cold Restart - Distributed Recovery Protocols - Two-Phase Commit Protocol (2PC) - Termination protocols for 2PC - Coordinator - Participant - Recovery Protocols for R2PC - Coordinator failure - Participant failure - Communication schemes for 2PC -Three-Phase Commit Protocol - Termination Protocols for 3PC - Coordinator -Participant - Recovery Protocols for 3PC - Election Protocol.

Distributed Query Processing -Concepts of Query Processing - Objectives of Distributed Query Processing - Phases in Distributed Query Processing - Query Decomposition - Normalization - Analysis - Simplification - Query Restructuring -Query Fragmentation - Reduction for Horizontal Fragmentation - Reduction for Vertical Fragmentation - Reduction for Derived Fragmentation - Reduction for Mixed Fragmentation - Global Query Optimization - Search space - Optimization Strategy -Distributed Cost Model - Cost Functions - Database Statistics - Cardinalities of intermediate results - Local Query Optimization - Global Query Optimization Algorithm -INGRES Algorithm-Distributed INGRES Algorithm – Distributed R* Algorithm – SDD -1 Algorithm. (20 Hours)

UNIT V

Distributed Database Security and Catalog Management: Distributed Database Security -View Management - View Updatability - Views in Distributed DBMS -Authorization and Protection - Centralized Authorization Control -Distributed Authorization Control - Semantic Integrity Constraints - Global System Catalog -Contents of Global System Catalog - Catalog Management in Distributed Systems.

Distributed Database Systems - SDD-1 Distributed Database System - General Architecture of SDD-1 Database System - Distributed Concurrency Control in SDD-1 -Conflict graph analysis - Timestamp-based protocols - Distributed Query Processing in SDD-1 - Access planning - Distributed execution - Distributed Reliability and Transaction Commitment in SDD-1 - Guaranteed delivery - Transaction control - The Write Rule - Catalog Management in SDD-1 -R* Distributed Database System -Architecture of R* - Query Processing in R* - Transaction Management in R* - The Presumed Abort Protocol - The Presumed Commit Protocol. (15 Hours)

TEXT BOOK

Chanda Ray (2009), Distributed Database System, Pearson Education India.

REFERENCE BOOK

- 1. Tamer Ozsu.M, Patrick Valduriez, *Principles of Distributed Database*, Second Edition, Pearson Education, India.
- 2. Elmasri and Navathe, *Fundamentals of Database Systems*, Sixth Edition, Pearson Education India.
- Seed K. Rahimi and Frank S. Haug (Aug 2010), *Distributed Database Management System*, Wiley, India.

Course Code	PO1	P	PO2		PO4	PO5	PO6		PO7	PO8
20PITC21	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Η	Η	Н	Н	Η	М	М	Н	-	L
CO2	Η	Η	Н	Н	М	Н	Η	М	-	L
CO3	Η	Η	Н	Н	М	L	М	L	I	L
CO4	Η	М	Н	М	М	L	М	М	-	L
CO5	Η	Η	Н	Н	Н	Н	Н	М	-	L

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

Semester II	DISTRIBUTED DATABASE SYSTEMS	Hours/We	Hours/Week: 6		
Core Course-4	DISTRIBUTED DATARASE SVSTEMS	Credits: 5			
Course Code	DISTRIBUTED DATADASE STSTEMS	Internal	External		
20PITC21N		40	60		

COURSE OUTCOMES

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

- CO1: express fundamental concepts of distributed database, data fragmentations, transparencies, transactions, database security and recovery for attaining professional excellence. [K2]
- CO2: ascertain the knowledge of database design concepts, distributed database architecture, concurrency control and query Processing of data distribution features to solve the common memory problem in digital networking. [K3]
- CO3: utilize the different types of fragmentation, distributed data independence, timestampbased concurrency control protocols for comparing the transaction concept in the database that helps in life time learning. [K3]
- CO4: measure and manage multi-database systems, local recovery protocols, phases in distributed query processing in an intelligent system with a great focus of research. [K4]
- CO5: evaluate the techniques of fragment allocation, locking-based concurrency control protocols, timestamp ordering (TO) algorithm, distributed INGRES algorithm, distributed R* algorithm SDD -1 algorithm is used to deal with committing a transaction that accesses databases stored on multiple nodes. [K5]

UNIT I

Distributed Database Concepts: Fundamentals of Distributed Database – Features of a Distributed DBMS – Advantages and Disadvantages Distributed DBMS – An example of Distributed DBMS - Homogeneous and Heterogeneous Distributed DBMS - Functions of Distributed DBMS - Components of a Distributed DBMS -Date's 12 Objectives S for Distributed Database Systems

Distributed Database Design: Distributed Database Design Concepts: Alternative Approaches for Distributed Database Design -Objectives of Data Distribution: Alternative Strategies for Data Allocation-Data Fragmentation - The Allocation of Fragments.

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(10 Hours)

UNIT II

Transparencies in Disturbed Database Design: Data Distribution Transparency – Transaction Transparency – Performance Transparency – DBMS Transparency.

Distributed DBMS Architecture – Introduction - Client Server System - Peer-to-Peer Distributed System- Multi-Database System (MDBS) (15 Hours) UNIT III

Distributed Transaction Management: Basic Concepts of Transaction Management - ACID Properties of Transactions - Objectives of Distributed Transaction Management - A Model for Transaction Management in a Distributed System -Classification of Transactions.

Distributed Concurrency Control: Objectives of Distributed ConcurrencyControl - Concurrency Control Anomalies - Distributed Serializability - Classification ofConcurrency Control Techniques - Locking-based Concurrency Control Protocols-Centralized 2PL- Primary Copy 2PL - Distributed 2PL - Majority Locking Protocol -BiasedProtocol - Quorum Consensus Protocol.(15 Hours)

UNIT IV

Distributed Recovery Management: Introduction to Recovery Management -Failures in a Distributed Database System - Steps Followed after a Failure - Local Recovery Protocols- Distributed Recovery Protocols.

Distributed Query Processing -Concepts of Query Processing - Objectives of Distributed Query Processing - Phases in Distributed Query Processing: Query Decomposition - -Query Fragmentation - Global Query Optimization – Local Query Optimization – Global Query Optimization Algorithm - INGRES Algorithm-Distributed INGRES Algorithm – Distributed R* Algorithm – SDD -1 Algorithm (20 Hours) UNIT V

Distributed Database Security and Catalog Management: Distributed Database Security -View Management - Authorization and Protection - Semantic Integrity Constraints - Global System Catalog.

Mobile Databases and object-oriented DBMS:-Mobile Databases-Introduction to Object-oriented Databases-Object-Oriented Database Management Systems

Distributed Database Systems - SDD-1 Distributed Database System - General Architecture of SDD-1 Database System - R* Distributed Database System - Architecture of R* - Query Processing in R* - Transaction Management in R* (15 Hours)

TEXT BOOK

Chanda Ray (2009), Distributed Database System, Pearson Education India.

REFERENCE BOOK

- 1. Tamer Ozsu.M, Patrick Valduriez, *Principles of Distributed Database*, Second Edition, Pearson Education, India.
- 2. Elmasri and Navathe, *Fundamentals of Database Systems*, Sixth Edition, Pearson Education India.
- Seed K. Rahimi and Frank S. Haug (Aug 2010), *Distributed Database Management System*, Wiley, India.

Course Code	PO1	P	02	PO3	PO4	PO5	PO	D6	PO7	PO8
20PITC21N	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	Н	Н	Н	М	М	Н	-	L
CO2	Н	Н	Н	Н	М	Н	Н	М	-	L
CO3	Н	Н	Н	Н	М	L	М	L	-	L
CO4	Н	М	Н	М	М	L	М	М	-	L
CO5	Н	Н	Н	Η	Н	Н	Н	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.K.Kasthuri Course Designer

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> M.Sc. INFORMATION TECHNOLOGY (2020 - 2021 onwards)

Semester: II		Hours/W	eek: 5	
Core Course-5		Credits: 5		
Course Code	ARTIFICIAL INTELLIGENCE	Internal	External	
20PITC22		40	60	

COURSE OUTCOMES

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

- CO1: discuss and demonstrate fundamental understanding of the evaluation of Artificial Intelligence (AI) and its foundations. [K2]
- CO2: illustrate the concepts and apply the basic principles, models, and algorithms of AI to recognize, model, and solve problems to build a real time AI Problems. [K3]
- CO3: adopt the structures and algorithms related to AI Techniques and language processing to real time and research projects implementation. [K3]
- CO4: establish the various searching techniques, constraint satisfaction problem, example problems- game playing techniques and extracting knowledge models from data to upgrade their skills and develop their career paths. [K4]
- CO5: summarize the limitations of current Artificial Intelligence techniques to solve real world computational problems. [K5]

UNIT I

Artificial Intelligence: the AI problems - the underlying assumption -AI

Techniques

Problems, Problem spaces and search: Defining The Problem as a State Spaces Search-Production Systems- Problem Characteristics – Production System Characteristics.

[10 Hours]

UNIT II

Heuristics Search Techniques:Generate – and- test- Hill climbing – Best –First Search – Problem Reduction –Constraint Satisfaction – Means- end analysis. [15 Hours]

UNIT III

Using Predicate Logic: Representing Simple Facts and Logic –Representing Instances and ISA Relationships- Computable Functions and Predicate – Resolution – Natural Deduction.

Representing knowledge Using Rules: Procedural versus Declarative knowledge – Logic Programming – Forward versus Backward reasoning – Matching – Control knowledge.

[15 Hours]

UNIT IV

Symbolic reasoning under uncertainty: Introduction to Nonmonotonic Reasoning- logics for nonomontonic reasoning – implementation issues – augmenting a problem solver – Implementation: Depth-first Search –Breadth-first Search.

Statistical Reasoning: Probability and Bayes Theorem – Certainty Factors and Rule- based Systems – Bayesian Networks – Dempster – Shafer Theory. Fuzzy Logic.

[18 Hours]

UNIT V

Weak Slot – and – Filler Structures: Semantic Nets – Frames.

Game Playing:Overview – The Minmax Search Procedure – Adding Alpha –Beta Cutoffs – Additional Refinements - Iterative Deepening.[17 Hours]

TEXT BOOKS

1. Elanie Rich, Kevin Knight, Shivashankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw Hill Education Private Limited, New Delhi,Fourth reprint 2010.

REFERENCES

- 1. M. Tim Jones (2008), *Artificial Intelligence: A Systems Approach (Computer Science)*, First Edition, Jones and Bartlett Publishers.
- 2. Ethem Alpaydin (2009), *Introduction to Machine Learning (Adaptive Computation and Machine Learning series)*, Second Edition, The MIT Press.
- 3. Nils J. Nilsson (2009), *The Quest for Artificial Intelligence*, Cambridge University Press.
- 4. William F. Clocksin, and Christopher S. Mellish (2003), *Programming in Prolog: Using the ISO Standard*, Fifth Edition, Springer.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC22	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	L	L	М	М	М	М	М	-	L
CO2	Н	Н	L	М	М	L	Н	L	-	L
CO3	Н	М	L	Н	Н	М	М	L	-	L
CO4	Н	М	L	Н	М	М	М	L	-	L
CO5	H	L	L	Н	М	М	L	L	-	L

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Dr.(Mrs).J.Kalavathi Course Designer



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VIRUDHUNAGAR - 626 001

M.Sc. INFORMATION TECHNOLOGY

(2022-23 onwards)

Semester II	ADTIFICIAL INTELLICENCE	Hours/We	Hours/Week: 5		
Core Course-5		Credits: 5			
Course Code	ARTIFICIAL INTELLIGENCE	Internal	External		
20PITC22N		40	60		

COURSE OUTCOMES

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

CO1: discuss and demonstrate fundamental understanding of the evaluation of

Artificial Intelligence (AI) and its foundations. [K2]

CO2: illustrate the concepts and apply the basic principles, models, and algorithms

of AI to recognize, model, and solve problems to build real time AI

Problems. [K3]

CO3: adopt the structures and algorithms related to AI Techniques and language

processing to real time and research projects implementation. [K3]

CO4: establish the various searching techniques, constraint satisfaction problem,

example problems- game playing techniques and extracting knowledge

models from data to upgrade their skills and develop their career paths. [K4]

CO5: summarize the limitations of current Artificial Intelligence techniques to

solve real world computational problems. [K5]

UNIT I

Artificial Intelligence: The AI problems – The Underlying Assumption –AI Techniques.

Problems, Problem spaces and search: Defining The Problem as a State SpacesSearch - Production Systems- Problem Characteristics - Production SystemCharacteristics.[10 Hours]

UNIT II

Heuristics Search Techniques: Generate – and- Test - Hill climbing – Best –First Search – Problem Reduction –Constraint Satisfaction – Means- end analysis. [15 Hours]

UNIT III

Using Predicate Logic: Representing Simple Facts and Logic – Representing Instances and ISA Relationships- Computable Functions and Predicate.

Representing knowledge Using Rules: Procedural versus Declarative knowledge-Logic Programming – Forward versus Backward reasoning.[15 Hours]

UNIT IV

Symbolic Reasoning Under Uncertainty:Introduction to Nonmonotonic Reasoning –Logics for Nonmonotonic reasoning – Implementation issues – Augmenting a problemsolver –Implementation:Depth-first Search –Breadth-first Search.[18 Hours]

UNIT V

Fuzzy Logic Systems: Introduction – Crisp Sets – Fuzzy Sets – Some Fuzzy Terminology – Fuzzy Logic Control – Sugeno Style of Fuzzy Inference Processing – Fuzzy Hedges – α Cut Threshold – Neuro Fuzzy Systems.

Connectionist Models: Learning in neural networks - Perceptrons -Backpropagation Networks - Boltzmann Machines - Reinforcement Learning -Unsupervised Learning - The Kohonen Neural Network Model. [17 Hours]

TEXT BOOKS

1. Elanie Rich, Kevin Knight, Shivashankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw Hill Education Private Limited, New Delhi,Fourth reprint 2010.

REFERENCES

- 1. M. Tim Jones (2008), *Artificial Intelligence: A Systems Approach (Computer Science)*, First Edition, Jones and Bartlett Publishers.
- 2. Ethem Alpaydin (2009), *Introduction to Machine Learning (Adaptive Computation and Machine Learning series)*, Second Edition, The MIT Press.
- Nils J. Nilsson (2009), *The Quest for Artificial Intelligence*, Cambridge University Press.
- 4. William F. Clocksin, and Christopher S. Mellish (2003), *Programming in Prolog: Using the ISO Standard*, Fifth Edition, Springer.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC22N	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	L	L	М	М	М	М	М	-	L
CO2	Н	Н	L	М	М	L	Н	L	-	L
CO3	Н	М	L	Н	Н	М	М	L	-	L
CO4	Н	М	L	Н	М	М	М	L	-	L
CO5	Η	L	L	Н	М	М	L	L	-	L

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> M.Sc. INFORMATION TECHNOLOGY (2020 -2021 onwards)

Semester II		Hours/W	eek: 5	
Core Course-6	MOBILE APPLICATIONS	Credits: 5		
Course Code	DEVELOPMENT	Internal	External	
20PITC23		40	60	

COURSE OUTCOMES

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

- CO1: generalize the limitations and challenges of Mobile ecosystem, Mobile Design Tools and Web Standards for wireless environment to pursue flexible career paths for technological changes. [K2]
- CO2: classify the different types of application models/ Mobile Information Architecture and its Native Application for developing mobile software applications and Android SDK Features for attaining professional excellence and carrying for research. [K3]
- CO3: attain Mobile Application Development, an Android platform for computing effective designs and solutions for specific real time problems. [K3]
- CO4: Characterize the Application Frameworks, Types of Mobile Applications, MobileWeb Development, An Open Platform for Mobile Development to solve problems inthe areas of Information Technology for sustainable environment. [K4]
- CO5: compare Multiple Mobile Browsers, Device Plans, Markup, Development Framework, The Android Application Life Cycle for acquiring future technologies through the foundation skills and knowledge and employ them to identify research gaps. [K5]

UNIT I

History of mobile: The Evolution of Devices - the Mobile ecosystem – Operators – Networks Devices – Platforms -Operating-Systems - Application Frameworks – Applications – Services - Size and Scope of the Mobile-Market - The Addressable Mobile Market-Mobile as a Medium. (12 Hours)

UNIT II

Mobile design: Thinking in Context-Taking the Next Steps- Developing a Mobile Strategy -New Rules- Types of Mobile Applications-Mobile Application Medium Types-Mobile Information Architecture – Mobile Information Architecture-The Design Myth-Interpreting Design-the Mobile Design Tent-Pole-Designing for the best possible experience-the elements of Mobile Design-Mobile Design Tools-Designing for the right Device-Designing for different Screen Sizes. (15 Hours)

UNIT III

Mobile Application Development:Mobile Web AppsVersus NativeApplications-the Ubiquity Principle-When to Make a Native Application When to Make aMobile Web Application- Mobile 2.0 - Mobile Web Development –Web Standards-Designing for Multiple Mobile Browsers-Device Plans-Markup – CSS: Cascading StyleSheets Java Script.(18 Hours)

UNIT IV

Introduction to Android: Background - An Open Platform for Mobile Development.-Native Android Applications - Android SDK Features.-Introducing the Open Handset Alliance.- Android Run - Develop for Android-Introducing the Development Framework. (16 Hours)

UNIT V

Application Development: Developing for Android- Developing for Mobile Devices-To-Do List Example -Android Development Tools.-An Android Application -Introducing the Application Manifest.-Using the Manifest Editor - The Android Application Life Cycle-Understanding Application Priority and Process State - A Closer Look at Android Activities. (14 Hours)

TEXT BOOKS

- 1. Brian Fling (2009), *Mobile Design and Development Practical concepts and techniques for creating mobile sites and web apps*, O'Reilly Media Publisher.
- Reto Meier (2012), Professional Android Application Development, John Wiley & Sons Publications.

REFERENCE BOOKS

 Jeff McWherter, Scott Gowell. (2012). Professional Mobile Application Development, John Wiley & Sons Publications.

 Dan Hermes. (2015). Xamarin Mobile Application Development: Cross-Platform C# and Xamarin. Forms fundamentals, Taylor & Francies Publications.

Course Code	PO1	P	02	PO3	PO4	PO5	PO6		PO7	PO8
20PITC23	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	М	М	М	М	Н	Η	Н	-	М
CO2	Н	М	Н	М	Н	Η	Η	Н	-	М
CO3	Н	М	М	Н	М	М	М	Н	-	Н
CO4	Н	Н	Η	H	Н	H	Η	H	-	H
CO5	H	Н	Н	Н	Н	H	Н	Н	-	H

3. Anwar Ludin. (2014). Learn BlackBerry 10 App Development, Apress.

Dr.(Mrs). A.Bharathi Lakshmi

Mrs.D.Shunmuga Kumari

Head of the Department

Course Designer

(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

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

Semester II	MOBILE APPLICATIONS DEVELOPMENT	Hours/W	Hours/Week: 5		
Core Course-6		Credits: 5			
Course Code 20PITC23N		Internal 40	External 60		

COURSE OUTCOMES

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

- CO1: generalize the background of Android Development Applications and explore Android Applications to pursue flexible career paths for technological changes. [K2]
- CO2: classify the different types of application models/ Mobile Information Architecture and its Native Application for developing mobile software applications and Android SDK Features for attaining professional excellence and carrying for research. [K3]
- CO3: attain Mobile Application Development, an Android platform for computing effective designs and solutions for specific real time problems. [K3]
- CO4: characterize the Application Frameworks, Types of Mobile Applications, GPS Functionality, an Open Platform for Mobile Development to solve problems in the areas of Information Technology for sustainable environment. [K4]
- CO5: summarize the Android Development Applications and tools to develop the application for acquiring future technologies through the foundation skills and knowledge and employ them to identify research gaps. [K5]

UNIT I

Introduction to Android: Background - An Open Platform for Mobile Development.-Native Android Applications - Android SDK Features.-Introducing the Open Handset Alliance.- Android Run - Develop for Android-Introducing the Development Framework. (12 Hours)

UNIT II

Application Development: Developing for Android- Developing for MobileDevices-To-Do List Example -Android Development Tools.-An Android Application -Introducing the Application Manifest.-Using the Manifest Editor - The AndroidApplication Life Cycle-Understanding Application Priority and Process State - A CloserLook at Android Activities.(15 Hours)

UNIT III

Exploring the Android SDK: Android SDK – Application Life Cycle.

Application: Hello World: Creating your first Android projects in Eclipse – examining the Android – created files – Hello world! Again – Hello World! Using an image. (18 Hours)

UNIT IV

Using the Command – Line Tools and the Android Emulator: Creating a shell Activity using the Windows CLI – Creating the Hello World! Activity in the Windows CLI – Hello World! On Linux.

Using Intents and the Phone Dialer: Introduction toIntents – Using the Dialer – placing a call from your Activity – Modifying the Android Phone Dialer. (16 Hours) UNIT V

List, Menus, and other views: Building the Activities – Using the Menu.

Using the Cell Phone's GPS Functionality: Using the Android Location – Based API – Reading the GPS with the Android Location – Based API – Try this: Toggling Between Map's View Standard and Satellite Views.

Application: Find a Friend: Creating a SQLite Database – Creating a Custom Content Provider – Creating the FindAFriend Activity – Running the FindFriend Activity.

(14 Hours)

TEXT BOOKS

- Reto Meier (2012), Professional Android Application Development, John Wiley & Sons Publications.
- Jerome Dimarizo, Android : A Programmer's Guide, New Delhi : Tata McGraw Publications Private Limited

REFERENCE BOOKS

- 1. Jeff McWherter, Scott Gowell. (2012). *Professional Mobile Application Development*, John Wiley & Sons Publications.
- 2. Brian Fling (2009), *Mobile Design and Development Practical concepts and techniques for creating mobile sites and web apps*, O'Reilly Media Publisher.

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 Dan Hermes. (2015). Xamarin Mobile Application Development: Cross-Platform C# and Xamarin. Forms fundamentals, Taylor & Francies Publications.

Curriculum for M.Sc. Information Technology

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC23N	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	М	М	М	М	Н	Н	Н	-	М
CO2	Н	М	Н	Н	Н	Н	Н	Н	-	Н
CO3	Н	М	М	Н	М	Н	Н	Н	-	Н
CO4	Н	Н	Н	Н	Н	Н	Η	Н	-	Н
CO5	Н	Н	Н	Н	Н	Н	Н	Η	_	Н

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

Course Designer



(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

M.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester II		Hours/We	eek: 5
Core Practical-3		Credits: 3	
Course Code	MOBILE APPLICATIONS LAB	Internal	Externa
20PITC21P		40	1
			60

COURSE OUTCOMES

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

- CO1: apply the basic components and basics of event handling of an Android application to develop their skills. [K3]
- CO2: demonstrate the basics of graphics and multimedia support in Android application and to build a real time application of their own. [K3]
- CO3: classify the installation and configuration of an Android application development tools on real time. [K3]
- CO4: illustrate an application using multi-threading, RSS feed and to Make use of location identification using GPS on global market environment. [K4]
- CO5: evaluate a native application using GUI components and Mobile application development framework for their research work. [K5]

Lab Exercises

- 1. Develop an application that uses GUI components, Font and Colors.
- 2. Develop an application that uses Layout Managers and event listeners.
- 3. Applications using controls
- 4. Develop a Native Calculator Application.
- 5. Write an application that draws basic graphical primitives on the screen.
- 6. Develop an application that makes use of database.
- 7. Applications involving Data Retrieval
- 8. Develop an application that makes use of RSS Feed.
- 9. Implement an application that implements Multi-Threading
- 10. Develop a native application that uses GPS location information.

- 11. Implement an application that writes data to the SD card.
- 12. Implement an application that creates an alert upon receiving a message.
- 13. Write a mobile application that creates alarm clock
- 14. Mobile networking applications (SMS/Email)

Course Code	PO1	PO	PO2		PO4	PO5	PO6		PO7	PO8
20PITC21P	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	М	L	М	L	L	М	Н	М	L
CO2	Н	М	L	М	L	М	L	Н	М	L
CO3	Н	М	L	М	Н	М	М	Н	М	Н
CO4	Н	Н	М	М	М	Н	Н	Н	Н	М
CO5	Н	М	М	L	Н	Н	М	Н	Н	М

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.G.Chandra Prabha Course Designer

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VIRUDHUNAGAR - 626 001

M.Sc. INFORMATION TECHNOLOGY

(2022 -2023 onwards)

20PITC21PN		40	60
Course Code	MODILE AT LICATIONS LAD	Internal	External
Core Practical-3	MOBILE APPLICATIONS LAB	Credits: 3	
Semester II		Hours/We	ek: 5

COURSE OUTCOMES

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

- CO1: apply the basic components and basics of event handling of an Android application to develop their skills. [K3]
- CO2: demonstrate the basics of graphics and multimedia support in Android application and to build a real time application of their own. [K3]
- CO3: classify the installation and configuration of an Android application development tools on real time. [K3]
- CO4: illustrate an application using multi-threading, RSS feed and to Make use of location identification using GPS on global market environment. [K4]
- CO5: evaluate a native application using GUI components and Mobile application development framework for their research work. [K5]

Lab Exercises

- 1. Develop an application that uses GUI components, Font and Colors.
- 2. Develop an application that uses Layout Managers and event listeners.
- 3. Create an App to display Date Picker Dialog.
- 4. Create an App to display Time Picker Dialog.
- 5. Create an App for Menu creation.
- 6. Create an App to display notifications.
- 7. Create an App to display Alert Dialog.
- 8. Develop an application that make use of database.
- 9. Develop an applications involving Data Retrieval
- 10. Create Applications using SQLite database
- 11. Develop an application that makes use of RSS Feed.

- 12. Implement an application that implements Multi-Threading.
- 13. Develop a native application that uses GPS location information.
- 14. Develop an application that writes data to the SD card.
- 15. Develop an application that creates an alert upon receiving a message.
- 16. Mobile networking applications (SMS/Email)

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC21PN	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	М	L	М	L	L	М	Η	М	L
CO2	Η	М	L	М	L	М	L	Η	М	L
CO3	Η	М	L	М	Η	М	М	Η	М	Η
CO4	Н	Η	М	М	М	Н	Н	Η	Η	М
CO5	Н	М	М	L	Н	Н	М	Η	Н	М

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.G.ChandraPrabha Course Designer

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

Semester II		Hours/We	eek: 5
Core Practical-4		Credits: 3	
	.NET		
Course Code	LAB	Internal	Externa
20PITC22P		40	1

COURSE OUTCOMES

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

- CO1: exercise .NET Framework and compute console and window based .NET application throughout their profession to understand the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE). [K3]
- CO2: implement string manipulation, events and exception handling within .NET application environment and create an application that contains use of ADO. [K3]
- CO3: apply simple data binding applications using ADO.Net connectivity, identify industry defined problem and find the solutions using .NET application. [K3]
- CO4: explore the usage of controls to create website and depict the knowledge of object oriented concepts design and apply in the lifelong learning. [K4]
- CO5: analyze real world projects and compile within the .NET framework to solve critical problems. [K5]

Write programs for the following in

VB.Net

- 1. To prepare employee pay bill
- 2.Prepare book details using structure
- 3.To calculate area for different shapes using function overloading

- 4. To prepare student mark list using constructor overloading
- 5. To authenticate Login form.
- 6. To prepare student details using database connectivity.
- 7.To prepare EB-bill using database.

C#.Net

- 8. To generate prime numbers and perfect numbers.
- 9. To prepare employee details using array of objects.
- 10. To calculate the time.
- 11. To subtract two complex numbers using constructor.
- 12. To prepare student mark list using multilevel inheritance.
- 13. To implement two- and three-dimensional objects using single inheritance.
- 14. To calculate area of different shapes using function overloading.
- 15. To process the banking transaction using this keyword.
- 16. To prepare inventory details using structure.
- 17. To sort an array.
- 18. To perform binary operator overloading
- 19. To prepare book details using interface.

ASP.Net

- 20. Program for Image map.
- 21. To prepare the product details using table.
- 22. Program for the validation control.
- 23. To display the student information in database grid view control.
- 24. To display the book details using Sql database control.
- 25. To display the items in tree view control using XML data source.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC22P	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	Н	Н	Н	М	Н	М	Н	Н	Н
CO2	Н	М	Н	Н	Н	М	Н	Н	Н	М
CO3	Η	Η	Η	L	М	Н	М	М	Η	М
CO4	Η	Η	Η	Н	Н	Н	Η	L	М	Η
CO5	H	Η	Η	Η	Н	Η	Η	L	L	Η

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.K.Kasthuri Course Designer

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

Semester II		Hours/Week: 5		
Core Practical-4	NFT I AR	Credits: 3		
Course Code 20PITC22PN		Internal 40	External 60	

COURSE OUTCOMES

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

- CO1: exercise .NET Framework and compute console and window based .NET application throughout their profession to understand the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE). [K3]
- CO2: implement string manipulation, events and exception handling within .NET application environment and create an application that contains use of ADO. [K3]
- CO3: apply simple data binding applications using ADO.Net connectivity, identifyindustry defined problems and find the solutions using .NET applications. [K3]
- CO4: explore the usage of controls to create website and depict the knowledge of object –oriented concepts design and apply in lifelong learning. [K4]
- CO5: analyze real world projects and compile within the .NET framework to solve critical problems. [K5]

Write programs for

the following in

VB.Net

- 1. To prepare employee pay bill
- 2.Prepare book details using structure
- 3.To calculate area for different shapes using function overloading

- 4. To prepare student mark list using constructor overloading
- 5.To authenticate Login form.
C#.Net

- 8. To generate prime numbers and perfect numbers.
- 9. To prepare employee details using an array of objects.
- 10. To calculate the time.
- 11. To subtract two complex numbers using a constructor.
- 12. To prepare a student mark list using multilevel inheritance.
- 13. To implement two- and three-dimensional objects using single inheritance.
- 14. To calculate areas of different shapes using function overloading.
- 15. To sort an array.
- 16. To perform binary operator overloading

ADO.NET

- 5. To prepare student information using C# database connectivity.
- 6. To prepare EB-bill using VB.NET database connectivity.
- 7. To process the banking transaction using C# database connectivity.
- 8. To maintain inventory details using VB.Net database connectivity.
- 9. To maintain book details using C# database connectivity.

ASP.Net

- 17. Program for Image map.
- 18. To prepare the product details using a table.
- 19. Program for the validation control.
- 20. To display the student information in database grid view control.
- 21. To display the book details using Sql database control.
- 22. To display the items in tree view control using XML data source.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC22PN	PSO	PSO	PSO	PSO3	PSO 4	PSO 5	PSO	PSO	PSO7	PSO8
	1	2. a	2. b				6. a	6. b		
CO1	Н	Н	Н	Н	М	Н	М	Н	Н	Н
CO2	Н	М	Н	Н	Н	M	Н	Н	Н	М
CO3	Н	Н	Н	L	М	H	М	М	Н	М
CO4	Н	Н	Н	Н	Н	H	Н	L	М	Н
CO5	Н	Н	Н	Н	Н	H	Н	L	L	Н

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.K.Kasthuri Course Designer

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

Semester II		Hours/W	eek: 5
DSEC-2		Credits: :	5
Course	INTERNET OF THINGS	Internal	External
Code		40	60
20PITE21			

COURSE OUTCOMES

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

- CO1: interpret the Physical and logical design methodology of IoT systems and their management, usage of python programming and Hadoop tool to build a real time Raspberry device. [K2]
- CO2: utilize the domain specific IoTs, web services to analyze the data analytics tool, and to provide IoT System Management with Netconf and SNMP protocol for better administration of network devices. [K3]
- CO3: implement basic programming concept for dijango and python to design a domain specific IoT devices logically and use the Hadoop tool for big data analytics in real time and research projects implementation. [K3]
- CO4: survey the domain specific IoTs in various fields, requirements of network operator for IoT management and Python programming, web API usage in logical design of Raspberry devices to implement real time problems. [K4]
- CO5: appraise the working model for IoT devices with various design methodologies, cloud and Apache web services platform, and Raspberry Pi IoT devices to upgrade their skills and develop their career paths. [K5]

UNIT I

Introduction to Internet of Things: Introduction – Physical Design of IoT – Logical Design of IoT – IoT Enabling Technologies – IoT& Deployment Templates.

Domain Specific IoTs: Introduction – Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health &Lifestyle. (13 Hours)

UNIT II

IoT and M2M: Introduction: M2M – Difference between IoT and M2M – SDN and NFV for IoT.

IoT System Management with NETCONF-YANG: Need for IoT SystemsManagement – Simple Network Management Protocol (SNMP) – Network OperatorRequirements – NETCONF- YANG – IoT Systems Management withNETCONF_YANG.(17 Hours)

UNIT III

IoT Platforms Design Methodology: Introduction – IoT Design Methodology – Case Study on IoT System for Weather Monitoring – Motivation for using Python.

IoT Systems – Logical Design using Python: Introduction – Installing Python – Python Data types & Data Structures – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – Python packages of Interest for IoT.

(15 Hours)

UNIT IV

IoT Physical Devices & Endpoints: What is an IoT Device – Exemplary Device: Raspberry Pi – About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python – Other IoTdevices.

IoT Physical Servers & Cloud Offerings : Introduction to Cloud Storage Models & Communication APIs – WAMP-AutoBahn for IoT – Xively Cloud for IoT – Python Web application Framework-Django – Designing a RESTful Web API – Amazon Web Services for IoT – Skynet IoT messaging platform. (16 Hours)

UNIT V

Case Studies Illustrating IoT Design: Introduction – Home Automation – Cities – Environment – Agriculture – Productivity applications.

Data Analytics for IoT:Introduction – Apache Hadoop – UsingHadoopMapReduce for Batch Data Analysis – Apache Oozier – Apache Spark – ApacheStorm – Using Apache Storm for Real-time Data Analysis.(14 Hours)

TEXT BOOK

ArshdeepBahga, Vijay Madisetti (2015), *Internet of Things*, Universities Press (INDIA) Private Ltd.

REFERENCE BOOKS

- 1. Qusay F. Hassan, Atta urRehman Khan. (2018).Sajjad A. Madani,*Internet of Things: Challenges, Advances, and Applications*, CRC Press.
- NasreddineBouhai&ImadSaleh . (2017). Internet of Things: Evolutions and Innoations, John Wiley & Sons Publications.
- 3. RajkumarBuyya, Amir VahidDastjerdi. (2016). *Internet of Things:Principles and Paradigms*, Elsevier.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITE21	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
_01111	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	М	М	М	L	Н	М	Н	Н	-	L
CO2	Н	Н	М	Н	Н	Н	Н	М	-	М
CO3	Н	Н	Н	Н	Н	Н	Н	Н	-	М
CO4	Н	Н	Н	М	Н	Н	Н	Н	-	М
CO5	H	Н	Н	Н	Н	Н	Н	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.G.Chandra Prabha Course Designer

(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

M.Sc. INFORMATION TECHNOLOGY

(2022-2023 onwards)

Semester II		Hours/W	eek: 5
DSEC-2	INTERNET OF THINGS	Credits: 5	5
Course Code		Internal	External
20PITE21N		40	60

COURSE OUTCOMES

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

- CO1: interpret the Physical and logical design methodology of IoT systems and their management, usage of python programming and Hadoop tool to build a real time Raspberry device. – K2
- CO2: utilize the domain specific IoTs, web services to analyze the data analytics tool, and to provide IoT System Management with Netconf and SNMP protocol for better administration of network devices. – K3
- CO3: implement basic programming concept for Dijango and python to design a domain specific IoT devices logically and use the Hadoop tool for big data analytics in real time and research projects implementation. – K3
- CO4: survey the domain specific IoTs in various fields, requirements of network operator for IoT management and Python programming, web API usage in logical design of Raspberry devices to implement real time problems. – K4
- CO5: appraise the working model for IoT devices with various design methodologies, cloud and Apache web services platform, and Raspberry Pi IoT devices to upgrade their skills and develop their career paths. **K5**

UNIT I

Introduction to Internet of Things: Introduction – Physical Design of IoT – Logical Design of IoT – IoT Enabling Technologies – IoT& Deployment Templates.

Domain Specific IoTs: Introduction – Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health & Lifestye. (13 Hours)

UNIT II

IoT and M2M: Introduction: M2M – Difference between IoT and M2M – SDN and NFV for IoT.

IoT System Management with NETCONF-YANG: Need for IoT SystemsManagement – Simple Network Management Protocol (SNMP) – Network OperatorRequirements – NETCONF- YANG – IoT Systems Management withNETCONF_YANG.(17 Hours)

UNIT III

IoT Platforms Design Methodology: Introduction – IoT Design Methodology – Case Study on IoT System for Weather Monitoring – Motivation for using Python.

IoT Systems – Logical Design using Python: Introduction – Installing Python – Python Data types & Data Structures – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – Python packages of Interest for IoT.

(15 Hours)

UNIT IV

IoT Physical Devices & Endpoints: What is an IoT Device – Exemplary Device: Raspberry Pi – About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python – Other IoTdevices.

IoT Physical Servers & Cloud Offerings : Introduction to Cloud Storage Models& Communication APIs – WAMP-AutoBahn for IoT – Xively Cloud for IoT – PythonWeb application Framework-Django – Designing a RESTful Web API – Amazon WebServices for IoT – SkynetIoT messaging platform.(16 Hours)

UNIT V

Data Analytics for IoT: Introduction – Apache Hadoop – Using HadoopMapReduce for Batch Data Analysis – Apache Oozie – Apache Spark – Apache Storm – Using Apache Storm for Real-time Data Analysis.

Tools for IoT :Introduction - Chef - Chef Case Studies. (14 Hours)

TEXT BOOK

ArshdeepBahga, Vijay Madisetti (2015), *Internet of Things*, Universities Press (INDIA) Private Ltd.

REFERENCE BOOKS

- 1. Qusay F. Hassan, Atta urRehman Khan. (2018).Sajjad A. Madani,*Internet of Things: Challenges, Advances, and Applications*, CRC Press.
- NasreddineBouhai&ImadSaleh . (2017). Internet of Things: Evolutions and Innoations, John Wiley & Sons Publications.
- 3. RajkumarBuyya, Amir VahidDastjerdi. (2016). *Internet of Things:Principles and Paradigms*, Elsevier.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITE21N	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	М	М	М	L	Н	М	Н	Н	-	L
CO2	Н	Н	М	Н	Н	Н	Н	М	-	М
CO3	Н	Н	Н	Н	Н	Н	Н	Н	-	М
CO4	Н	Н	Н	М	Н	Н	Н	Н	-	М
CO5	H	Н	Н	Н	H	Н	Н	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.G.ChandraPrabha Course Designer



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

Semester II		Hours/We	ek: 5
DSEC-2	DATA MINING	Credits: 5	
Course Code		Internal	External
20PITE22		40	60

COURSE OUTCOMES

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

- CO1: express the functionality of the various data mining and data warehousing component to enhance their knowledge. [K2]
- CO2: assign the appropriate algorithm to solve real world problem. [K3]
- CO3: experiment and evaluate different data mining techniques like classification, clusterin and association rule for applying current technical concepts and practices. [K3]
- CO4: discriminate different methodologies used in data mining to find solutions for specific domain problems. [K4]
- CO5: assess the strengths and limitations of various data mining and data ware housing models in real world based on their carrier. [K5]

UNIT I

Introduction: Motivation of Data Mining–Importance of Data Mining - So, Definition of Data mining - Data Mining – kinds of data - Data Mining Functionalities – Kinds of Patterns Mined - Interesting Patterns - Classification of Data Mining Systems -Data Mining Task Primitives - Integration of a Data Mining System with a Database or Data Warehouse System - Major Issues in Data Mining.

Data Preprocessing:Need of Preprocessor of Data - Descriptive DataSummarization.(15 Hours)

UNIT-II

Data Warehouse: An Overview Data Ware House - A Multidimensional Data Model-Data Warehouse Architecture.

Mining Frequent Patterns and Associations:Basic Concepts and a RoadMap -Efficient and scalable frequent item set mining method- Mining various kinds of
association rules.(10 Hours)

UNIT III

Classification and Prediction: Classification – Prediction – Issues regarding Classification and prediction-Classification by Decision tree induction-Bayesian Classification-Lazy Learners-Other classification methods-Prediction. (15 Hours) UNIT IV

Cluster Analysis: Cluster analysis-Types of Data in Cluster Analysis-Partitioning Methods-Hierarchical Methods-Density Methods-Grid Based methods-Outlier analysis.

(15 Hours)

UNIT V

Graph Mining, and Multi relational Data Mining: Graph Mining – Multi relational Data Mining.

Mining Objects, spatial, Multimedia, Text, and Web Data: Multidimensional analysis and Descriptive Mining of complex data objects.

Spatial data Mining: spatial Data cube Construction and Spatial OLAP - Mining Spatial Association and Co-location Patterns.

Multimedia Data Mining: Similarity Search in Multimedia Data – Multidimensional Analysis of Multimedia Data.

Applications of Data Mining: Data Mining Applications. (20 Hours)

TEXT BOOK

Jiawei Han and Micheline Kamber (2006), *Data Mining Concepts and Techniques*, Second Edition, Morgan Kaufmann Publishers.

REFERENCE BOOKS

- 1. Prabu.C.S.R. (2007). Data warehousing, concepts, Techniques, Products and Applications, PHI.
- 2. Gupta.G.K. (2006). Introduction to Data mining with Case Studies, PHI.
- BPB. (2014). Data Mining, Typical Data Mining Process for Predictive Modeling, BPB Publications.

Curriculum for M.Sc. Information Technology

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITE22	PSO 1	PSO 2. a	PSO 2. b	PSO 3	PSO 4	PSO 5	PSO 6. a	PSO 6. b	PSO 7	PSO 8
CO1	Н	М	L	L	М	М	L	L	-	L
CO2	Η	Н	М	L	М	L	Н	L	-	L
CO3	Н	L	L	Н	Н	М	L	L	-	L
CO4	Н	М	L	М	L	М	М	L	-	L
CO5	Н	L	М	L	L	М	М	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Dr.(Mrs).J.Kalavathi Course Designer

(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

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

Semester II		Hours/W	eek: 5
DSEC-2	ADVANCED SOFTWARE ENGINEERING	Credits: 5	5
Course Code		Internal	External
20PITE23		40	60

COURSE OUTCOMES

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

- CO1: explain the basic concepts, process models, quality and maintenance of software engineering to design a secure system. [K2]
- CO2: illustrate the software requirements, design concepts and architectural design to provide technology-based conclusions. [K3]
- CO3: examine the various testing strategies involved in conventional and object-oriented programming to develop reliable software. [K3]
- CO4: establish the ability to use modern engineering like re-engineering, reverse engineering necessary for software project management and software reuse to work effectively as a team leader. [K4]
- CO5: summarize the requirements modeling, goals and metrics of software engineering to achieve project target. [K5]

UNIT I

Software Engineering: Software Engineering-The Software Process-Software Engineering Practice.

ProcessModels:A GenericProcessModel–ProcessAssessmentandImprovement - Prescriptive Process Models.(15 Hours)

UNIT II

Understanding Requirement: Requirements Engineering– Establishing the Groundwork – Eliciting Requirements – Developing Use cases – Building Requirements Model – Negotiating Requirements – Validating Requirements.

Requirements Modeling: Requirements Analysis – Scenario- Based Modeling– UML Models that supplement the Use Case- Data Modeling Concepts – Class Based Modeling. (20 Hours)

UNIT III

Design Concepts: The Design Process- Design Concepts-The Design Model.

Architectural Design: Software Architecture- Architectural Styles – Architectural Design. (15 Hours)

UNIT IV

Software Testing Strategies: A Strategic Approach to Software Testing – Strategic Issues – Test Strategies for Conventional Software – Test Strategies for Object Oriented Software – Validation Testing – System Testing

Testing Conventional Applications:White Box Testing – Basis Path Testing–Control Structure Testing – Black Box Testing.(10 Hours)

UNIT V

Software Quality Assurance: Elements of Software quality assurance –SQA Tasks, Goals, and Metrics – Software Reliability.

MaintenanceandReengineering:SoftwareMaintenance-Softwaresupportability-SoftwareRe engineering-Reverse Engineering.(15 Hours)

TEXT BOOK

Roger S Pressman, *Software Engineering, A Practitioners Approach*, Seventh Edition, MC Graw Hill Education.

REFERENCE BOOKS

- Waman S Jawedkar(2005), Software Engineering Principles and Practice, TMH.
- 2. Leth Bridge, Timochy (2004), Object Oriented Software Engineering, TMH.
- Hans Van Vliet(2008), Software Engineering: Principles and Practices, Jhon Wiley & Sons Publications.

Curriculum for M.Sc. Information Technology

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITE23	PSO 1	PSO 2. a	PSO 2. b	PSO 3	PSO 4	PSO 5	PSO 6. a	PSO 6. b	PSO 7	PSO 8
CO1	Н	М	М	Н	М	Н	М	Н	-	М
CO2	Н	L	Η	Н	L	М	Н	М	-	М
CO3	Н	Η	Н	Н	М	М	L	М	-	М
CO4	Н	Н	Н	Н	Н	Н	Н	Н	-	L
CO5	Н	Н	Н	Н	Н	Н	Н	Н	-	L

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.S.Rajapriya Course Designer

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> M.Sc. INFORMATION TECHNOLOGY (2020 - 21 onwards)

Semester III		Hours/W	eek: 6
Core Course-7	PYTHON PROGRAMMING	Credits: 5	
Course Code		Internal	External
20PITC31		40	60

COURSE OUTCOMES

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

- CO1: grasp the basic programming concepts, Objects scope, Lists, file manipulations and OOPs concept to enhance their knowledge. [K2]
- CO2: implement the operators, functions, recursion to manipulate numbers as well as strings by using the concept of classes and objects to solve the real world problems in an easier manner. [K3]
- CO3: examine the various mutable and immutable objects, control structures, file handling functions and inheritance to design and test a real time project. [K3]
- CO4: analyze the basic programming fundamentals, Recursion and exception handling procedures to integrate the Java application with Python programming that enables their research skills and improve the career opportunity. [K4]
- CO5; assess their own projects by using python programming constructs with classes and objects to collect and share the data from social media which helps for the research works. [K5]

UNIT I

Python Programming: An Introduction : IDLE – An Interpreter for Python – Python Strings – Relational Operators – Logical Operators – Bitwise Operators –

Variables and Assignment statements – Keywords – Script Mode.

Functions: Built-in Functions – Function definition and Call – Importing Userdefined Module – Assert statement – Command line arguments.

Control Structures: if Conditional statement –Iteration. (15 Hours)

UNIT II

Debugging: Testing – Debugging.

Scope: Objects and Object ids – Scope of objects and names.

Strings: Strings – String Processing Examples – Pattern Matching. (20 Hours)

UNIT III

Mutable and Immutable Objects: Lists – Sets – Tuples – Dictionary.

Recursion: - Recursive solutions for problems on Numeric data, Recursivesolutions for problems on Strings – Recursive solutions for problems on Lists – Problemof Tower of Hanoi.(15 Hours)

UNIT IV

Files and Exceptions: File Handling - Writing Structures to a file – Errors and Exceptions – Handling Exceptions using try--- except – File Processing Example.

Classes I: Classes and Objects – Person: An example of Class – Class as Abstract Data Type – Date class. (20 Hours)

UNIT V

Classes II: Polymorphism – Encapsulation, Data Hiding, and Data Abstraction – Modifier and Accessor methods – Static Method – Adding methods dynamically – Composition – Inheritance – Built-in Functions for Classes. Applications of Python: Collecting information from Twitter – Sharing Data Using Sockets – Managing Databases Using Structured Query Language(SQL) – Developing mobile Application for Android – Integrating Java with Python – Python chat application using Kivy and Socket Programming. (20 Hours)

TEXT BOOK

Sheetal Taneja, Naveen Kumar, *Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications*, Pearson publications, 4th Edition @ 2019.

REFERENCE BOOKS

1. Kenneth A. Lambert, (2012). Fundamentals of Python: First Programs, CENGAGE Learning. 2. Robert Sedgewick, Kevin Wayne, Robert Dondero, (2016). Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd.

3. Timothy A. Budd, (2015). Exploring Python, Mc-Graw Hill Education (India) Private Ltd.

Course Code	PO1	Р	02	PO3	PO4	PO5	PO	D6	PO7	PO8
20PITC31	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	L	L	М	Н	М	Н	Н	-	М
CO2	Н	М	L	Н	Н	Н	Н	Н	-	L
CO3	Н	L	L	Η	Η	Η	Н	Η	-	М
CO4	Н	Н	М	М	Н	Н	Н	Н	-	М
CO5	H	Н	М	М	Η	Н	Н	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.G.Chandraprabha Course Designer



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VIRUDHUNAGAR - 626 001

M.Sc. INFORMATION TECHNOLOGY

(2020 - 2021 onwards)

Semester III		Hours/W	eek: 6
Core Course-8	INFORMATION SECURITY	Credits: :	5
Course Code 20PITC32		Internal 40	External 60

COURSE OUTCOMES

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

- CO1: summarize the principal concepts, major issues, technologies, and basic approaches in information security. [K2]
- CO2: illustrate the working principles of information security, with its legal, ethical and professional issues and understand risk management for the development of reliable communication system. [K3]
- CO3: ascertain security perspective of network identification viewpoints, and trade-offs to provide technology based conclusions. [K3]
- CO4: analyze various standards and practices of security and apply the technological aspects for real world computational problems. [K4]
- CO5: measure our network security research and analyze real-life security cases to be acquainted with the latest trends in technological development. [K5]

UNIT I

Introduction to Information Security – Introduction – History of Information Security – Define Security – CNSS Security Model – Components of an Information System – Balancing Information Security and Access - Approaches to Information Security Implementation – The Systems Development Life Cycle – The Security Systems Development Life Cycle – Security Professionals and the Organization.

The Need for Security:Introduction – Business Needs First – Threats – Attacks-Secure Software Development.(17 Hours)

UNIT II

Legal, Ethical and Professional Issues in Information Security: Introduction – Law and Ethics in Information Security – International Laws and Legal Bodies – Ethics and Information Security – Code of Professional Organization.

Risk Management:Introduction – An overview of Risk Management – Risk Identification– Risk Assessment – Risk Control Strategies – Selecting a Risk Control Strategy -Quantitative Versus Qualitative Risk Control Practices.(20 Hours)

UNIT III

Planning for Security: Introduction – Information Security Planning and Governance - Information Security Policy, Standards and Practices –Security Education, Training and Awareness Program – Continuity Strategies.

 Security Technology: Firewalls and VPNs: Introduction - Access Control – Firewalls

 - Protecting Remote Connections.
 (18 Hours)

UNIT IV

Security Technology: Intrusion Detection and Prevention Systems, and Other Security Tools: Introduction - Intrusion Detection and Prevention Systems - Honeypots, Honeynets, and Padded Cell Systems - Scanning and Analysis Tools - Biometric Access Controls.

Cryptography: Introduction - Cipher Methods - Cryptographic Algorithms - Cryptographic Tools - Protocols for Secure Communications - Attacks on Cryptosystems.

(18 Hours)

UNIT V

Physical Security: Introduction - Physical Access Controls - Fire Security and Safety - Failure of Supporting Utilities and Structural Collapse - Interception of Data - Mobile and Portable Systems - Special Considerations for Physical Security.

Implementing Information Security: Introduction - Information Security ProjectManagement - Technical Aspects of Implementation - Nontechnical Aspects ofImplementation.(17 Hours)

TEXT BOOK

Michael Whitman, E., and Herbert Mattord, J., (2003). *Principles of Information Security*, 4th edition, Delhi : Cengage Learning India Pvt. Ltd.

REFERENCE BOOKS

- 1. Micki Krause, Harold Tipton, F., (2004). *Handbook of Information Security Management*, Vol 1-3 Florida :CRC Press LLC.
- 2. Stuart McClure, Joel Scram bray, George Kurtz, (2003). *Hacking Exposed*, New Delhi : Tata McGraw-Hill.
- 3. Matt Bishop, (2002). Computer Security Art and Science, Delhi : Pearson/PHI.

Course Code	PO1	Р	02	PO3	PO4	PO5	PO	D6	PO7	PO8
20PITC32	PSO 1	PSO 2. a	PSO 2. b	PSO 3	PSO 4	PSO 5	PSO 6. a	PSO 6. b	PSO 7	PSO 8
CO1	Η	Н	М	М	М	Н	М	Н	-	М
CO2	Η	Н	Η	Н	М	Н	Н	Н	-	М
CO3	Н	Н	Н	Н	Н	Н	Н	Н	-	L
CO4	Н	Н	Η	Н	Н	Н	Н	Н	-	L
CO5	Н	Н	Н	Н	Н	Н	Н	Н	-	L

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

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

Semester III	PYTHON PROGRAMMING LAB	Hours/W	Hours/Week: 6		
CorePractical-5		Credits: 3			
Course Code 20PITC31P		Internal 40	External 60		

COURSE OUTCOMES

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

- CO1: demonstrate why Python is a useful scripting language for developers as well as its structure and how to design and program Python applications using lists, objects and tuples for designing a real-world application. [K3]
- CO2: build the applications by using loops, decision statements, functions and packages in Python to optimize the programming level and reusability of python modules. [K3]
- CO3: apply the methods of reading and writing files, design object-oriented programs with Python classes and implementing exception handling to deliver the data in error free format. [K3]
- CO4: illustrate the need for working with the strings, functions and files to analyze real time data. [K4]
- CO5: determine the necessity of functions in programs which are used in mathematics, and Science to achieve project target. [K5]

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Lab Exercises

Write the following programs in Python

- 1. Program using control statements.
- 2. Program using functions.
- 3. Program using RecursiveFunctions
- 4. Program using stringmethods
- 5. Program using Listmethods
- 6. Program implementing manipulation of matrices.
- 7. Program to implement Stack and Queue usingList.
- 8. Program for linear and binarysearch.
- 9. Program for varioussorting.

- 10. Program using built-in functions ofList.
- 11. Program using setoperations
- 12. Program using setmethods.
- 13. program to perform various database operations (create, insert, delete, update).
- 14. Program using built-in functions oftuple.
- 15. Program implementing dictionary and dictionarymethods.
- 16. Program for filemanipulation.
- 17. Program for applying watermarking inimage.
- 18. Program by implementing ImageFilters.
- 19. Program implementing images egmentation.
- 20. program by using exception handlingmechanism

Course Code	PO1	P	02	PO3	PO4	PO5	PO	06	PO7	PO8
20PITC31P	PSO	PSO	PSO 2 h	PSO 2	PSO	PSO	PSO	PSO	PSO 7	PSO
	1	2. a	<i>2.</i> 0	3	4	3	0. a	0. D	/	0
CO1	Н	М	М	Н	Н	М	Н	М	М	L
CO2	Н	Н	Н	Н	Н	Н	Н	Н	Н	М
CO3	Η	М	Н	Н	М	Н	Η	Н	М	L
CO4	Н	Н	М	Н	Н	Н	Н	М	Н	L
CO5	Н	Н	Н	Н	Н	Н	Н	Н	Н	М

Dr.(Mrs). A.Bharathi Lakshmi Head of the Department Mrs.K.Kasthuri Course Designer

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

Semester III	NETWORK PROGRAMMING LAB	Hours/W	Hours/Week: 6		
CorePractical-6		Credits:	3		
Course Code 20PITC32P		Internal 40	External 60		

COURSE OUTCOMES

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

- CO1: classify the working principle of various communication protocols, connection oriented and connection-less models to attain professional excellence. [K3]
- CO2: apply algorithms for congestion control and flow control which is included for realworld project domains knowledge of effective designs and solutions. [K3]
- CO3: assign the client/server applications and TCP/IP, UDP socket programming for the latest technologies and techniques to solve projects skill. [K3]
- CO4: investigate the distributed application using RMI, NET Beans effectively with intelligent systems with a focus of research. [K4]
- CO5: evaluate the packet /file transmission between nodes in an effective way to achieve and adopt new technologies and constantly upgrade their skills. [K5]

Lab Exercises

Using C

- 1. Write a C program to determine if the IP address is in Class A, B, C, D, or E.
- 2. Write a C program to translate dotted decimal IP address into 32 bit address.
- 3. Reading IP and port ID from command line and sending message to server
- 4. Downloading File From Http Server
- 5. Implementation Of Domain Name Space
- 6. Simulation of Sliding Window Protocol
- 7. Simulation Address resolution Protocol
- 8. Write a C program to generate Hamming code.

Using JAVA

- 1. Implementation of ping programming
- 2. Implementation of Client server Application for chat using TCP
- 3. Java Socket Program Using UDP For EchoServer and EchoClient Communication
- 4. Java multicast programming.
- 5. Implementation of Online test for a Single Client
- 6. To write a java program for SNMP application.
- 7. To write a socket program for implementation of echo
- 8. To write a client-server application for chat using TCP
- 9. To Perform File Transfer in Client & Server Using TCP/IP.
- 10. To implement Remote Command Execution (RCE).
- 11. To write a program to implement simple client-server application using UDP.
- 12. To implement Address Resolution Protocol
- 13. To download a webpage using Java

Using RMI

- 1. Perform Inventory Management.
- 2. Perform simple Mathematical calculations.
- 3. Prepare EB bill.

Course Code	PO1	P	02	PO3	PO4	PO5	PO	D6	PO7	PO8
20PITC32P	PSO 1	PSO 2. a	PSO 2. b	PSO 3	PSO 4	PSO 5	PSO 6. a	PSO 6. b	PSO 7	PSO 8
CO1	Н	М	М	Н	М	Н	М	М	М	L
CO2	Η	Н	Н	Н	М	Н	Н	Н	Н	М
CO3	Η	Н	Н	Н	Н	Н	Н	Н	М	М
CO4	Η	Η	Н	Н	Н	Н	Н	Η	Н	L
CO5	Н	Н	Н	Н	Η	Η	Н	Н	Н	М

Dr.(Mrs). A.Bharathi Lakshmi

Mrs.D.Shunmuga Kumari Course Designer



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

Semester III		Hours/Week: 1
Course Code	PRACTICE FOR SET/NET –	Credits: 1
20PGOL31	GENERAL PAPER	Internal
		100

COURSE OUTCOMES

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

CO1: discuss various concepts related to higher education system, teaching,

communication, research, ICT and environmental studies. [K2]

- CO2: apply the skills of communication, mathematical, internet and research aptitude incompetitive examinations. [K3]
- CO3: analyze the circumstances, instances, contents and arrive at / choose the best

option. [K4]

CO4: interpret the data using ICT tools and logical reasoning. [K5]

CO5: build self learning activities to face challenges in their life. [K6]

UNIT I Teaching & Research Aptitude

Teaching: concept, objectives, levels of teaching, factors affecting teaching, Methods of teaching of Higher learning, Evaluation systems.

Research: Meaning, Types, Methods of Research, Steps of Research, Thesis and Article writing, Application of ICT in research.

UNIT II Communication and Higher Education System

Communication, Meaning, types, characteristics of communication, Verbal and non – verbal, Barriers to communication.

Higher Education System : Professional, Technical, skilled Based education, Value education, Policies, Governance and Administration.

UNIT III Comprehension

A passage of text will be given. Answers should be given according to the questions from the passage.

UNIT IV Mathematical, Logical Reasoning and Data Interpretation

Mathematical Logical Reasoning : Number series, letter series, Analogies, Venn diagram and Mathematical Aptitude.

Data Interpretation : Graphical representation and mapping of Data, Data and

Governance. UNIT V ICT and Environmental Studies

 \mbox{ICT} : General abbreviations, Basics of Internet, E-mail, Digital initiatives in higher education.

Environmental Studies: Pollution, Impacts of Pollutants, Natural and energy sources, Natural disasters and environmental protection Act.

BOOKS FOR STUDY:

Madan KVS (2019), NTA – UGC NET/SET/JRF- Teaching and Research

Aptitude, Pearson India Education Services Pvt. Ltd., Noida.

REFERENCE BOOKS

- Rashmi Singh and Asim Khan (2019), UGC-NET Paper- I, Disha Publication, New Delhi.
- 2. Dr.Usha Rani Jain (2018), UGC-NET Mital Books India Ltd., New Delhi.

Course code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
20PGOL31								
CO1	Н	Н	-	-	М	L	-	L
CO2	Н	Н	L	М	Н	М	-	М
CO3	Н	М	М	Н	Н	М	-	М
CO4	Н	М	Н	Н	Н	Н	-	L
CO5	Н	L	М	L	L	Н	-	L

Dr.A.Uma Devi Head of the Department Tmty.K.Anitha Tmty.S.Malathi Course Designers

(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

> M.Sc. INFORMATION TECHNOLOGY (2020 -2021 onwards)

Semester IV		Hours/Week: -		
Extra Credit Course – 1	SOFTWARE PROJECT	Credits: 2		
20PITO31	MANAGEMENT	Internal	External	
		100	-	

COURSE OUTCOMES

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

- CO1: describe the methodologies, software project models, risk management, frame work creation and factors including software quality assurance to enhance their project skills. [K2]
- CO2: observe the concepts of project infrastructure, software estimation techniques, network planning models, cost monitoring and the importance of software quality to build their own projects effectively. [K2]
- CO3: determine the estimation effort of project activity, software prototype, identify critical activities of activity planning, earned value analysis and Use case diagrams to represent activities help the students to step forward their career opportunities. [K3]
- CO4: analyze the resources needed for project planning, Risk Management, software process models, organizing team structure to develop their project and static class diagrams representation to develop their research skills. [K4]
- CO5: assess the project products identification, COCOMO model for software estimation, PERT technique for Risk Management, Virtual team leadership and software quality plans to develop real time projects. [K5]

UNIT I:

Introduction: Importance of Software Project Management – Project – Software Project Vs Other types of Project – Contract Management and Technical Project Management – Activities covered by Software Project Management – Plans , Methods and Methodologies – some ways of Categorizing Software Projects – Stake holders – Setting Objectives – Business case – Management control.

An overview of Project Planning: Introduction to stepwise project planning – select project – identify project scope and objectives – identify project infrastructure – analyse project characteristics – identify project products and activities – estimate effort for each activity – identify activity risks – allocate resources – review/publicize plan – Execute plan/Lower levels of planning.

UNIT II:

Selection of an appropriate project approach: Introduction – Choosing methodologies and Technologies – software processes and process models – Choice of process models – Structure vs speed of delivery – The Waterfall model – The Spiral Model – Software Prototyping – other ways of categorizing prototypes – Incremental Delivery – Atern/Dynamic systems development method – Rapid Application Development.

Software Effort Estimation: Introduction – Where are estimates done? – Problems with over and under estimates – Basis for software estimating – Software effort estimation techniques – Expert Judgement – Estimating by analogy – Albrecht function point analysis – Function points Mark II – COSMIC full function points – COCOMO: a Parametric productivity model.

UNIT III:

Activity Planning: An Introduction – Objectives of Activity Planning – When to Plan-project schedules – project & activities – Sequencing and scheduling activities-Network planning models-Formulating a network model-Adding the time dimension-The forward pass-The backward pass- Identifying the critical path – Activity float- Shortening the project duration- Identifying critical activities-Activity on arrow networks.

Risk management: Introduction- Risk-Categories of Risk-A framework for dealing with risk – Risk Identification –Risk Assessment- Risk Planning- Risk Management – Evaluating risks to the schedule- Applying the PERT Technique –Mote Carlo simulation – Critical Chain Concepts.

UNIT IV:

Monitoring and Control: Introduction- Creating the framework – Collecting the data- Visualizing Progress- Cost Monitoring – Earned Value Analysis – Prioritizing monitoring – Getting the project back to target- Change control.

Working in Teams: Introduction – Becoming a team-Decision making – Organization and team structure – coordination dependencies – Dispersed and Virtual team – leadership.

UNIT V:

Software Quality: Introduction – The place of Software quality in project planning – The importance of software quality – Defining Software quality – ISO 9126-product and process metrics - Product Vs Process Software quality management – Techniques help to enhance software quality –Quality Plans.

The Unified Approach and Unified Modeling Language (UML): The Unified Approach (UA) - Unified Modeling Language (UML)-Static Class Diagram-Use Case Diagram-Behavior Diagrams.

TEXT BOOKS:

- Software Project Management, Bob Hughes and mike Cotterell, Tata Mc GrawHill Fourth edition, 2006.
- Software Engineering Principles And Practice, Waman S Jawadekar, Tata McGraw Hill Education Private Limited, New Delhi, 2009.

REFERENCE BOOKS:

- 1. Software Project Management, A Concise Study, S.A.Kelkar, PHI,2007.
- Applying UML and Patterns, Craig Larman, Pearson Education, Third edition, New Delhi, 2012.

Course Code	PO1	PO	02	PO3	PO4	PO5	PO	06	PO7	PO8
20PITO31	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	М	L	М	М	Н	Н	М	Н	L
CO2	Н	L	М	Н	М	Н	Н	М	Н	М
CO3	Н	L	L	М	Н	Н	М	Н	Н	М
CO4	Н	Н	Н	Н	Н	Н	Н	Н	Н	М
CO5	Н	L	Н	Н	М	Н	М	Н	Η	М

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.G.ChandraPrabha Course Designer

(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

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

Semester IV		Hours/Week: 6		
Core Course –	BIG DATA ANALYTICS	Credits: 5		
Course Code 20PITC41		Internal 40	External 60	

COURSE OUTCOMES

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

- CO1: understand the sources and characteristics of big data in the real-world applications as well as how to access and process those data using R programming. [K2]
- CO2: illustrate the concepts behind the descriptive analytics and predictive analytics of data although the different visualization techniques and also identify the specialized aspects to segment the big data with the help of different big data applications. [K3]
- CO3: apply big data like streams, social media data and large database through the applications of R programming. [K3]
- CO4: analyze the different and integrated environment for analysis of real world applications having unstructured data in large amount by the programming R to encounter real time challenges. [K4]
- CO5: compare the real time projects and frame three tired architecture for real time unstructured data. [K5]

UNIT I

Introduction: Volume – Velocity – Variety – Veracity.Drivers for Big Data:Sophisticated Consumers – Automation – Monetization.(15 Hours)

UNIT II

Big Data Analytics Applications: Social Media Command Center – Product Knowledge Hub – Infrastructure and Operations Studies – Product Selection, Design and Engineering – Location-Based Services – Micro-Segmentation and Next Best Action – Online Advertising – Improved Risk Management. **Architecture Components:** Massively Parallel Processing (MPP) Platforms – Unstructured Data Analytics and Reporting – Search and Count – Context – Sensitive and Domain – Specific Searches – Categories and Ontology – Qualitative Comparisons– Focus on Specific Time Slice or Using Other Dimensions – Big Data and Single View of Customer/Product – Data Privacy Protection – Real-Time Adaptive Analytics and Decision Engines. (20 Hours) UNIT III

Advanced Analytics Platform: Real – Time Architecture for Conversations – Orchestration and Synthesis Using Analytics Engines – Entity Resolution – Model Management – Command Center – Analytics Engine – Discovery Using Data at Rest – Integration Strategies. Implementation of Big Data Analytics: Revolutionary, Evolutionary, or Hybrid – Big Data Governance – Integrating Big Data with MDM – Journey, Milestones, and Maturity Levels – Analytics Business Maturity Model.

(20 Hours)

UNIT IV

Getting Started: Run R – A First R Session – Introduction to Functions – Preview of Some Important R Data Structures – Extended Example: Regression Analysis of Exam Grades – Startup and Shutdown – Getting Help. Vectors: Scalars, Vectors, Arrays, and Matrices – Declarations – Recycling – Common Vector Operations – Using all() and any()– Vectorized Operations – Filtering – A Vectorized if-then-else: The ifelse() Function – Testing Vector Equality – Vector Element Names – More on c().(20 Hours) UNIT V

Data Frames: Creating Data Frames – Other Matrix – Like Operations – MergingData Frames – Applying Functions to Data Frames. R Programming Structures: ControlStatements – Arithmetic and Boolean Operators and Values – Default Values forArguments – Return Values – Functions Are Objects – Environment and Scope Issues –No Pointers in R – Writing Upstairs – Recursion.(15 Hours)

TEXT BOOK

- 1. Arvind Sathi, Big Data Analytics, 1st Edition. MC Press,
- 2. Norman Matloff, (2011). *The Art of R Programming: A Tour of Statistical Software Design*, No Starch Press.

REFERENCE BOOKS

- Mark Gardener, (2013). Beginning R The Statistical Programming Language, Wiley.
- Torsten Hothorn and Brian S. Everitt (2014). A Handbook of Statistical Analyses Using R, 3rd Edition.CRC Press.
- 3. Seema Acharya, Subhasini Chellappan, (2015). Big Data Analytics, Wiley.

Curriculum for M.Sc. Information Technology

Course Code	PO1	P	02	PO3	PO4	PO5	PO	06	PO7	PO8
20PITC41	PSO 1	PSO 2. a	PSO 2. b	PSO 3	PSO 4	PSO 5	PSO 6. a	PSO 6. b	PSO 7	PSO 8
CO1	Н	Н	Н	М	М	Н	Н	М	-	М
CO2	Н	М	Н	М	Н	Н	Н	М	-	М
CO3	Н	Н	Н	Н	Н	Н	М	М	-	М
CO4	Η	М	М	М	М	Н	М	М	-	L
CO5	Н	Н	Н	М	Н	Н	М	М	-	L

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.K.Kasthuri Course Designer

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> M.Sc. INFORMATION TECHNOLOGY (2020 - 2021 onwards)

Semester IV		Hours/W	eek: 6
CorePractical-7	R PROGRAMMING LAB	Credits: 2	3
Course Code 20PITC41P		Internal 40	External 60

COURSE OUTCOME

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

- CO1: assign the basic commands of R Programming in statistical analysis, graphics representation and reporting which includes for pursue flexible career paths amidst future technological changes. [K3]
- CO2: manipulate the integrated collection of tools for data analysis which includes realworld project domains knowledge to produce effective designs and solutions for specific real-time problems in the field of Information Technology. [K3]
- CO3: compute the latest technologies and synthesize the workspace of current R working environment and includes any user-defined objects such as vectors, matrices, data frames, lists, functions to solve real-time projects skill. [K3]
- CO4: analyze the different types of graphs in an interactive manner and packages for R functions thereby innovate new ideas in execution of projects effectively with intelligent systems. [K4]
- CO5; assess the statistical analysis, read and write into various file formats like csv, excel, xml and avail with clustering techniques to achieve real-time project that targets and adopt new technologies which constantly upgrade their skills. [K5]

Lab Exercises

1. Write the basic R commands for the given vector:-

a. (i) $x \leftarrow c(4,2,6)$ (ii) $y \leftarrow c(1,0,-1)$

- 2. Write the R commands for the following results:
 - a. (i)7 8 9 10 11
 - b. (ii)Sequence from 2 to 9
 - c. (iii)Sequence from 3 to 30 of length 10
 - d. (iv)6420-2-4

- 3. Write the command for the following results:
 - a. (i)2 2 2 2
 - b. (ii)1 2 1 2 1 2 1 2 1 2 (iii) 1 1 1 1 2 2 2 2 2
 - c. (iii) 1 1 1 1 2 2 2 2 d. (iv)1 2 3 4 1 2 3 4
 - e. (v)1 1 1 2 2 2 3 3 3 4 4 4
 - f. (vi)6,6,6,6,6,6
 - g. (vii)5,8,5,8,5,8,5,8
 - h. (viii)5,5,5,5,8,8,8,8
- 4. Create a given matrix using R commands
 - a. x y
 - [1] 5 6
 - [2] 7 3
 - [3] 9 4
 - b. (i)Find the dimension of the created matrix
 - c. (ii)Use the R commands to bind the row of created matrix
 - d. (iii)Use the R commands to bind the column of created matrix
- 5. Create a matrix using given vector $z \leftarrow c(5,7,9,6,3,4)$ where the number of row

should

be 3.

- 6. Create a matrix using given vector $z \leftarrow c(5,7,9,6,3,4)$ where the number of column should be 3.
- 7. Write a R program to perform a arithmetic operation.
- 8. Write a R program to perform string manipulation.
- 9. Write a R program to import CSV file to R console.
- 10. Write a R program to import from R console to CSV file.
- 11. Write a R program to sort a array.
- 12. Draw a line graph using student details to perform R console to CSV file.
- 13. Draw a pie chart using employee details to accessing CSV file to R console.
- 14. Draw a bar chart using hostel details to perform R console to CSV file.
- 15. Draw a pie chart using sample population for the village to perform R console to CSV file.
- 16. Write a R program to perform K Means Clustering Algorithm.

Course Code	PO1	PO2		PO3	PO4	PO5	PO6		PO7	PO8
20PITC41P	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	М	М	М	Η	М	М	Η	М	М	L
CO2	Η	Η	Η	Η	М	Η	Η	Η	Η	М
CO3	Η	Η	Η	Η	Η	Η	Η	Η	М	М
CO4	Н	Η	Η	Η	Η	Η	Η	Η	Н	L
CO5	Н	Η	Η	Η	Η	Η	Η	Η	Η	М

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Mrs.D.Shunmuga Kumari Course Designer
V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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> M.Sc. INFORMATION TECHNOLOGY (2020 -21 onwards)

Semester IV	SOFTWARE TESTING LAB	Hours/Week: 6			
CorePractical-8		Credits: 3			
Course Code 20PITC42P		Internal 40	External 60		

COURSE OUTCOME

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

- CO1: discover Various test processes, continuous quality improvement, Types of errors and fault models that pursue flexible career paths on future technological changes. [K3]
- CO2: Manipulate Methods of test generation from requirements and Behaviour modelling using UML: Finite state machines (FSM) for specific real-time problems in the field of Information Technology. [K3]
- CO3: use the various test tools, testing models of the latest technologies and synthesize the workspace of current techniques to solve real-time projects skill. [K3]
- CO4: examine the test generation from FSM models and Input space modelling using combinatorial designs with intelligent systems that focuses on their future. [K4]
- CO5: evaluate combinatorial test generation, test adequacy assessment using: control flow, data flow, and program mutations, project to targets and adopt new technologies which constantly upgrade their skills. [K5]

Lab Exercises

- 1. Write programs in "C" Language to demonstrate the working of if else construct
- 2. Write programs in "C" Language to demonstrate the working of switch constructs
- 3. Write programs in "C" Language to demonstrate working of "for" construct
- 4. A program written in "C" language for matrix multiplication fails "Introspect the causes for its failure and write down the possible reasons for its failure".
- 5. Write Test Cases for Banking Application.
- 6. Write Test Cases for Inventory Application.
- 7. Perform and validate Evolutionary Testing.
- 8. Perform and validate Unit Testing.

- 9. Perform and validate Path Coverage Testing.
- 10. Perform and validate Functional Testing.

Course Code	PO1	PO	52	PO3	PO4	PO5	PO	D6	PO7	PO8
20PITC42P	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	6. a	6. b	7	8
CO1	Н	М	М	Н	М	М	Η	М	М	L
CO2	Н	Н	Η	Н	М	Η	Η	Η	Η	М
CO3	Н	Н	Η	Н	Н	Η	Η	Η	М	М
CO4	Н	Н	Η	Н	Н	Н	Η	Η	Н	L
CO5	H	Η	Η	Н	Н	Η	Η	Η	H	М

Dr.(Mrs). A.Bharathi Lakshmi

Mrs.D.Shunmuga Kumari

Head of the Department

Course Designer

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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

Semester IV		Hours/W	eek: 12	
Core Course	PROJECT	Credits: 6		
Course Code 20PITC41PR		Internal 40	External 60	

COURSE OUTCOME

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

- CO1: apply disciplinary concepts and methods appropriate to their areas of study. [K3]
- CO2: discover the strategies to calculate risk factors involved in IT projects.[K3]
- CO3: use project management software to design and implement IT projects. [K3]
- CO4: discover, analyze, and solve problems creatively through sustained critical investigation. [K4]
- CO5: develop the skills, diligence, and effective communication skills by delivering seminars based on projects. [K5]

Course Code	PO1	P	02	PO3	PO4	PO5	P	D6	PO7	PO8
20PITC41PR	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
	1	2. a	2. b	3	4	5	б. а	6. b	7	8
CO1	Н	М	М	Н	М	Н	Η	М	М	L
CO2	Н	Н	М	Н	М	Н	М	Н	Н	М
CO3	Н	Н	Н	Н	Н	Н	Η	Н	М	М
CO4	H	H	Η	Η	Η	Η	Η	Η	Η	L
CO5	H	H	H	H	Η	H	Η	H	Η	М

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

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

V.V.VANNIAPERUMAL COLLEGE FOR WOMEN

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

Semester IV	Project - Research Methodology	Hours/Week: 12			
Core Course	&	Credits: 6			
Course Code 22PITC41PR	Ethics	Internal 60	External 40		

COURSE OUTCOME

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

- CO1: apply disciplinary concepts and methods appropriate to their areas of study. [K3]
- CO2: discover the strategies to calculate risk factors involved in IT projects.[K3]
- CO3: use project management software to design and implement IT projects based on research Ethics. [K3]
- CO4: discover, analyze, and solve problems creatively through sustained critical investigation with ethics. [K4]
- CO5: develop the skills, diligence, and effective communication skills by delivering seminars based on projects. [K5]

UNIT I

Research Ethics: Introduction – Types of Research: Theoretical – Experimental – Applied – Qualitative and Quantitative Research – Components of a Research Paper: Title – Abstract – Introduction – Literature Review – Methodology – Results and Discussion – Conclusion – References.

UNIT II

Publication Ethics: Introduction – Style manual in writing: MLA and APA Style
Plagiarism: Introduction – Types of Plagiarism – Avoidance of Plagiarism –

Antiplagiarism – Turnitin and Paper Writer – Journal Indexing – Google Scholar – Scopus – Web of Science – Citation Index – h-index – i-index.

Project Work and Viva-Voce

• Project will be done by the final year students individually in the fourth semester under the guidance of respective guides.

- Course comprises two units Research Methodology theory paper and Project Completion.
- An Internal Assessment for a maximum of 20 marks will be carried out for the theory paper.
- For projects internal marks will be awarded by the respective guide and external marks will be awarded in the external examinations held at the end of the semester.
- The report of the project must be in the prescribed form. It should be typed neatly in MS word (12 pt, Times New Roman, 1.5 spacing)
- The project report should be written in 40 50 pages.
- Two copies of the project report with binding should be submitted.

TEXT BOOK

Material prepared by the Faculty Members of Computer Applications, Computer Science and Information Technology Departments.

REFERENCE BOOK

C.R.Kothari (2014).*Research Methodology Methods and Techniques*, 2nd Revision Edition, New Age International Publishers, India.

Course Code	PO1	P	02	PO3	PO4	PO5	PO	D6	PO7	PO8
22PITC41PR	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO
2211101111	1	2. a	2. b	3	4	5	б. а	6. b	7	8
CO1	Н	М	М	Н	М	Η	Η	М	М	L
CO2	Н	Н	М	Н	М	Н	М	Н	Н	М
CO3	Н	Н	Η	Η	Η	Н	Η	Η	М	М
CO4	Н	Н	Η	Н	Н	Н	Η	Н	Н	L
CO5	Н	Η	Η	Η	Η	Η	Η	Н	Н	М

Evaluation Pattern (100 marks)									
Internal Assessment (60marks) External Assessment (40 marks									
One Periodic Test	Project	Pre-Submission	One Open online	Project	Viva				
(20)	Report (20)	Presentation	Course related to	Presentation	Voce(10)				
	_	(10)	the Project (10)	(30)					

Dr.(Mrs). A.Bharathi Lakshmi

Head of the Department

Dr.(Mrs). A.Bharathi Lakshmi

Course Designer