FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A++" Grade by NAAC (4th Cycle)

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT: B.C.A

NAME OF THE PROGRAMME : COMPUTER APPLICATIONS

PROGRAMME CODE : USCA

ACADEMIC YEAR : 2022 - 2023

FATIMA COLLEGE (AUTONOMOUS), MADURAI - 625 018

THE MINUTES OF THE BOARD OF STUDIES

DEPARTMENT OF COMPUTER APPLICATIONS [BCA & PGDCA]

TO BE IMPLEMENTED FROM 2022-2023 ONWARDS

The board of Studies meet for framing the Syllabus for Department of Computer Applications [BCA & PGDCA] Was held on 21.03.2022 at 10:30 AM

The members of the board were,

UNIVERSITY NOMINEE (BCA) :

Dr. M. RAMAKRISHNAN,
PROFESSOR & HEAD CHAIR PERSON,
DEPARTMENT OF COMPUTER APPLICATIONS,
SCHOOL OF INFORMATION TECHNOLOGY
MADURAI KAMARAJ UNIVERSITY
MADURAI.

21/3/2022

UNNERSITY NOMINEE (PGDCA) :

DR. M. RAMASWAMY
PROFESSOR,
DEPARTMENT OF COMPUTER APPLICATIONS,
SCHOOL OF INFORMATION TECHNOLOGY,
MADURAI KAMARAJ UNIVERSITY,
MADURAI.

21/3/22

Subject Expert :

Dr. S. Shajun Nisha
Assistant Professor & Head,
Pg & Research Department Of Computer Science,
Sadakkathulla Appa College,
Rahmath Nagar,
Tirunelveli.

Subject Expert :

Dr. S. Padmavathi,
Professor,
Department Of Information Technology,
Thiagarajar College Of Engineering,
Madurai - 625 015.

Industrialist :

Ms. A. Divya Sri,
Software Developer,
BSE Tech Pvt Ltd,
Madurai - 16

A. Divya Sri

Alumna :

Ms. Varshini Dom
3.6.2 Rajaji Street,
Melachokkanathapuram,
Bodi Nayakanur
Theni.

Dom. Varshini

Ms. S. Selva Rani,
Assistant Professor & Head,
Department Of Computer Applications
Fatima College
Madurai – 18

Dr. G. Preetha,
Assistant Professor,
Department Of Computer Applications
Fatima College
Madurai – 18

Ms. R. Ramya,
Assistant Professor,
Department Of Computer Applications,
Fatima College,
Madurai – 18

Ms. J. Arockia Jackuline Joni,
Assistant Professor,
Department Of Computer Applications
Fatima College
Madurai – 18

Ms. A. Punitha Rosline
Assistant Professor,
Department Computer Applications
Fatima College
Madurai – 18

DEAN OF ACADEMIC AFFAIRS :

MS. A. MABLE JASMINE SHOBA. M. Mable Jasmine Sho

In the beginning of the meeting the Head of t Department Ms.S.Selvarani Welcomed all the members of board and briefed them about the current updations a progress of the department.

The members of the board expressed their hi appreciation and Satisfaction about the department.

Action taken Report for 2021 - 2022

S.NO	Common Suggestions Offered in the Previous Board	Action Taken For the Academic Year 2021 - 22
1.	The Skill based course 19J3SB1 Quantitative Aptitude can be replaced with the title Logical Reasoning and Data Interpretation.	Title change was done to make the Students Concentrate more on data interpretation and reasoning.
2.	The 19JIXME - Non major Elective Flash is outdated and can be replaced with any other Open Source Animation tool.	NME - Animation Tools and Techniques (ALICE - Open Source Tool) was introduced to develop creativity skills and to impart animation techniques and create motion movies.
	for Diploma,	
3.	The title for the course 19PDB101 - Computer Fundamentals and OS can be replaced with Computer Fundamentals.	Title change was done and the fundamentals of Operating System concept was included.
4.	Lab Course 19PDB105 - Web programming and photo Editing Techniques can be replaced with the title web programming.	Title change was done, to get more knowledge in web development skills.

S.NO	COMMON SUGGESTIONS OFFERED IN THE PREVIOUS BOARD	ACTION TAKEN FOR THE ACADEM YEAR 2021-22.
5.	Photo Editing Techniques can be given as separate lab course.	Photo Editing Techniques w introduced as a separate course.
6.	Python Programming can be introduced as a new course	Python Programming was introduced to gain knowled in real time applications.

CHANGE OF COURSE TITLE - 2020-2021

S.NO	OLD COURSE CODE	NEW COURSE CODE	OLD COURSE TITLE	NEW COURSE TILLE	NEED FOR CHANG
1.	19J3SB1	19J3SB1	Quantitative Aptitude	Logical Reasoning and Data Interpretation	To make the Stud Concentrate mor on data interpreta and reasoning
2.	19PDB101	19PDB101	Computer Fundamentals and OS	Computer Fundamentals	To make the Students learn the working of Operating System
3.	19PDB105	19PDB105	Web Programming and Photo editing Techniques.	Web Programming	To get more knowledge in website developme skills.

New Courses Introduced - 2020-2021

S.No	Course Code	Course Title	Relevance To #			Scope for #				Need for Introduction
			L	R	N	GL	Emp	Ent	SD	
1	21JINME	Non Major Elective - Animation Tools And Techniques				*	#	#	#	To develop programming skills and impart animation techniques and motion movies.
	21J2NME	Non major Elective - Animation Tools & Techniques.				*	#	#	#	To develop programming skills and impart animation techniques and motion movies.
	21J2SL1	Open Source Animation Tools				*	#	#	#	To develop programming skills and impart animation techniques and motion movies.
	21J4SLJm2	Content Writing And Video Making				*	#	#	#	To create content while designing web pages and working on videos.
	21J6SLI6	Data Science				*	#	#	#	To know about R Language that is widely used to do analysis and focus on research.
	21PDB106	Lab III - Design Techniques.				*	#	#	#	To improve employability skills.
	19PDB202	Python programming				*	#			To gain knowledge in real time applications.

Revised Courses 2020-2021

S. No	Course Code	Course Title	No. & Title of units Revised with the Revised Content Specified if it is Not the Whole Unit	% of Revision	Need for Revision	Relevance To *				Skill For #	
						L	R	N	EP	EN	TE
1.	J5CC12	Java Programming	Control Statements, Inheritance, I/o Streams, Two event handling mechanism, Gui programming.	45%	Concepts are more detailed.				*	#	
2.	J5CC13	Lab-V Java Programming	Revision based on theory.	45%	-				*	#	S.
3.	J5CC14	Lab-VI Dot Net Programming	Revision based on theory.	70%	-				*	#	#
4.	J5ME1	Dot Net Programming	Dot net framework, VB.Net Features, Removed, VB.Net, ADO.Net.	70%	more Concepts of Asp. Net instead of VB.Net				*	#	#

2022 Onwards

1. Updation of open educational Resources in the list of references of each course.

S.No	Course Code	Course Title	Details Of Updation
	NIL		

2. Revision Of Courses

S.No	Course Code	Course Title	No. & Title of units Revised With the Revised Content Specified if it is not the whole unit	% of Revision	Need for Revision	Relevance to *				Scope for #		
						L	R	IV	G	Emp	Entre	SD
1.	19JCC1	Programming in C	III & IV - Application Implementation	10%	To know how to use the concept real time				*	#		#
2.	19JCC2	Lab in C	Revision based on Theory.	10%	To know how to use the concept real time				*	#		#
3.	19J2CC3	Object oriented Programming in C++	III & IV - Applicatim Implementation.	10%	To know how to use the concept real time				*	#		

S. NO	COURSE CODE	COURSE TITLE	NO & TITLE OF UNITS REVISED WITH THE REVISED CONTENT SPECIFIED IF IT IS NOT THE WHOLE UNIT	% OF REVISION	NEED FOR REVISION	RELEVANCE TO *			SCOPE FOR #			
						L	R	N	G	Emp	Entre	SD
4.	19J2CC4	Lab in CH	Revision based on Theory	10%.	To know how to use the Concept real time				*	#		
5.	19J3CC5	Operating Systems	III - Bankers Algorithm V-RISC & CISC to be added.	10%.	Get Know-ledge on algorithms				*			#
6.	19J3CC6	Lab in Relational Database management Systems.	Include Lab programs based on real time applications.	10%.	To know how to use the concept real time				*	#		
7.	19J5CC9	Software Engineering	II - Models to be added	10%.	To analyze on the different kinds of models.				*			#
8.	19J5ME1	Cloud Computing	Cloud Services and Stack - II unit	10%.	To know about Services				*	#		

For Diploma

S. No	Course Code	Course Title	No & Title of Units Revised with the Revised Content Specified if it is not the whole Unit.	% of Revision	Need for Revision	Relevance To #				Scope for #		
						L	R	IV	In	Emp	Entre	St
9.	19PDB101	Computer Fundamentals	Allocation of frames and Thrashing - IV	10%	To know about thrashing				%	#		
10.	19PDB105	Lab-web programming	Programs using JavaScript added	10%	To get knowledge on scripts				%			#

3. New Courses Introduced - 2022 - 2023.

New Courses Introduced

S. No	Course Code	Course Title	Relevance To #				Scope for #			Need for Introduction
			L	R	N	In	Emp	Entre	SD	
1.	22JbSBS	Skill based - V Power-BI			*			#		To make the Students learn about the latest Collection of Software Services, apps and Connections working together.

4. Introduction of purely Skill embedded Certificate/ Diploma / Advanced Diploma Value - Added Course Other than the Value added Course that is already being offered.

S. NO	COURSE CODE	COURSE TITLE	MOU with INDUSTRY/ ORGANIZATION	SKILLS SHARPENED	COURSE OUTCOME
		Value added Certificate Course Cloud computing Services.	-	Improving App development Skills Services and know about Various Cloud terminologies	Understand properties, methods and events of cloud Services. Utilize and understand different cloud Service formats. - Utilize the free and open Source cloud Services. Analyze the use of Virtualization

5. Approval of Ph.D Course work Syllabus - NIL

6. Rubrics for Internship / project.

S.NO	C1 20 marks	C2 20 marks	CIA Total 40 marks	External 60 marks.
1.				

DETAILS OF PROPOSED / SIGNED MOUs.

- L - Local
- R - Regional
- N - National
- G - Global.

- Employability

- Entrepreneurship

- Skill Development.

Other Suggestions :

1. In Data Mining Algorithms can be reduced
2. For E-Content Development Course practical oriented concepts can be added.
3. L/P/T - Lecture Practical Tutorial Concepts can be followed in the Syllabus.
4. Including latest Concepts like Cloud, IoT, Networks and Information Security for Pln Diploma.

Commendations :

1. PHP can be added in Web programming instead of Ap
2. Online Courses or Self learning Course can be taken by advanced Learners.
3. Latest Edition of Text books to be given and maintain the order.
4. E-books can be circulated for Pln Diploma Students.

1. Dr. M. RAMAKRISHNAN

2. Dr. M. RAMASWAMI

3. Dr. S. SHAJUN NISHA

4. Dr. S. PADMAVATHI

5. Ms. A. DIVYA SRI

6. Ms. VARSHINI DOM

7. Ms. S. SELVA RANI

8. Dr. G. PREETHA

9. Ms. R. RAMYA

10. Ms. J. AROCKIA JACKULINE JONI

11. Ms. A. PUNITHA ROSLINE.

12. Ms. A. MABLE JASMINE SHOBA

DEAN OF ACADEMIC AFFAIRS.

Dr. G. Celine Saheya Mary
21/3/2022

COLLEGE PROFILE

Fatima College (Autonomous), Mary Land, Madurai, is a Post Graduate and Research Institution for Women affiliated to Madurai Kamaraj University. It is a Catholic Minority institution established and run by St. Joseph's Society of Madurai (of the Congregation of the Sisters of St. Joseph of Lyons, France). This institution came into existence through the tireless efforts of the missionary sisters of St. Joseph of Lyons and the zeal and heroic sacrifice of Rev. Sr. Rose Benedicta, the Foundress of the College.

The College was started in St. Joseph's Campus Madurai as a Second Grade College with 63 students in 1953. It was upgraded into a Post Graduate College in 1964; Autonomous in 1990 and a Research Institute in 2004. The College now offers 21 Undergraduate Programmes, 13 Postgraduate Programmes, 2 Professional Programme, 5 M.Phil. Programmes and 6 Departments have become Research Centres. It has strength of 4134 Students, 206 Teaching Staff and 100 Non-Teaching Staff.

The comprehensive assessment by NAAC in 1999 placed Fatima College in Five Star Status of merit. The college strives to sustain excellence, quality and relevance while equipping the students to meet the demands of higher education in India. In 2004 UGC conferred on Fatima College the status of College with Potential for Excellence. In 2006 and 2013 NAAC Re-Accredited the College with 'A' Grade. The College was ranked 94th in the All India NIRF Ranking in 2019 by MHRD.

VISION

WOMEN'S EMPOWERMENT THROUGH EDUCATION

The vision of the college is to empower women by developing human capabilities through quality education based on Christian values, making them responsible citizens who can work for the advancement of the society and promote communal harmony in the multi-religious and multi-cultural reality of India eventually evolving into women of communion.

MISSION

- To enhance quality of life through the development of individuals.
- To enable women to become contributors in the economic, social and political development of India.
- To equip the students with 21st century skill-sets with a focus on problem-solving abilities
- To motivate them to work for social justice
- To give preference to the rural economically backward and first-generation learners
- To enable students to be employed in the technology oriented competitive market

VISION OF THE DEPARTMENT

The vision of the department is to empower women by bringing out their hidden potentials by providing quality computer education to meet excellence and adapt to the challenges of the society.

MISSION OF THE DEPARTMENT

- To bring out the inherent talents of each student & guide them to adapt to the dynamic IT world and make them responsible citizens.
- To be trained with cutting edge technologies in order to improve their

personality in a supportive and caring environment.

- To build leadership traits among students.
- To inculcate ethical attitude among computer professionals.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

A graduate of B.C.A programme after three years will be

PEO 1	Our graduates will be academic, digital and information literates, creative, inquisitive, innovative and desirous for the "more" in all aspects.
PEO 2	They will be efficient individuals and team performers, exhibiting progress, flexibility, transparency and accountability in their professional work
PEO 3	Our graduates will be effective managers in all sorts of real life and professional circumstances, making ethical decisions, pursuing excellence within the time frame and in demonstrating apt leadership skills
PEO 4	They will engage locally and globally evincing social and environmental stewardship, demonstrating civic responsibilities and employing right skills at the right moment

GRADUATE ATTRIBUTES (GA)

Fatima College empowers her women graduates holistically. A Fatimite achieves all-round empowerment by acquiring Social, Professional and Ethical competencies. A graduate would sustain and nurture the following attributes:

I. SOCIAL COMPETENCE	
GA 1	Deep disciplinary expertise with a wide range of academic and digital literacy
GA 2	Hone creativity, passion for innovation and aspire excellence
GA 3	Enthusiasm towards emancipation and empowerment of humanity

GA 4	Potentials of being independent
GA 5	Intellectual competence and inquisitiveness with problem solving abilities befitting the field of research
GA 6	Effectiveness in different forms of communications to be employed in personal and professional environments through varied platforms
GA 7	Communicative competence with civic, professional and cyber dignity and decorum
GA 8	Integrity respecting the diversity and pluralism in societies, cultures and religions
GA 9	All – inclusive skill sets to interpret, analyse and solve social and environmental issues in diverse environments
GA 10	Self awareness that would enable them to recognise their uniqueness through continuous self-assessment in order to face and make changes building on their strengths and improving their weaknesses
GA 11	Finesse to co-operate exhibiting team-spirit while working in groups to achieve goals
GA 12	Dexterity in self-management to control their selves in attaining the kind of life that they dream for
GA 13	Resilience to rise up instantly from their intimidating setbacks
GA 14	Virtuosity to use their personal and intellectual autonomy in being life-long learners
GA 15	Digital learning and research attributes
GA 16	Cyber security competence reflecting compassion, care and concern towards the marginalised
GA 17	Rectitude to use digital technology reflecting civic and social responsibilities in local, national and global scenario
II. PROFESSIONAL COMPETENCE	
GA 18	Optimism, flexibility and diligence that would make them professionally competent
GA 19	Prowess to be successful entrepreuners and become

	employees of trans-national societies
GA 20	Excellence in Local and Global Job Markets
GA 21	Effectiveness in Time Management
GA 22	Efficiency in taking up Initiatives
GA 23	Eagerness to deliver excellent service
GA 24	Managerial Skills to Identify, Commend and tap Potentials
III. ETHICAL COMPETENCE	
GA 25	Integrity and be disciplined in bringing stability leading a systematic life promoting good human behaviour to build better society
GA 26	Honesty in words and deeds
GA 27	Transparency revealing one's own character as well as self-esteem to lead a genuine and authentic life
GA 28	Social and Environmental Stewardship
GA 29	Readiness to make ethical decisions consistently from the galore of conflicting choices paying heed to their conscience
GA 30	Right life skills at the right moment

PROGRAMME OUTCOMES (PO)

On completion (after three years) of B.C.A programme, the students are able to

PO 1	Understand, analyze and apply the concepts of latest technologies to bring solutions to the problems in the areas of computer applications.
PO 2	Analyze and synthesize computing systems through quantitative and qualitative techniques along with effective verbal and non-verbal communication.

PO 3	Apply technical and professional skills practically to excel in providing solutions for solving complex real life problems satisfying industrial and societal needs.
PO 4	Understand & analyze the technical data through innovative methodologies with legal ethics to reach out actionable conclusions.
PO 5	To promote leadership skills and also as an individual on working with multi disciplinary projects using Modern computing tools and Open Source Technologies.
PO 6	Commit to professional ethics and cyber regulations considering the societal and environmental issues within local and global contexts for sustainable development

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion (after three years) of B.C.A programme, the students are able to

PSO 1	To achieve significant understanding of theoretical and programming concepts in key areas of Computer Applications.
PSO 2	To expand and sharpen practical and problem solving skills to provide solutions to industry, society and business problems.
PSO 3	To apply modern practices and strategies in software project development using open source and other programming environments.
PSO 4	To inculcate the ability to analyze and interpret problems, make inferences from the resulting data and apply technical skills to solve real time problems.
PSO 5	To make graduates understand various professional, technical and ethical issues prevailing in the industry
PSO 6	To gain exposure in preventive, ethical hacking and security technologies in recent trends

PSO 7	To equip the students to meet the requirement of Corporate world and Industry standards
PSO 8	To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications
PSO 9	To generate ideas of innovation and to identify, formulate and solve problems in software solutions, outsourcing services, public and private sectors
PSO 10	To engage the students technically on par with the societal and environmental responsibilities added with professional ethics

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

DEPARTMENT OF BCA

For those who joined in June 2019 onwards

PROGRAMME CODE :USCA

PART – I – TAMIL / FRENCH / HINDI– 12 CREDITS

PART – I – TAMIL

Offered by The Research Centre of Tamil

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKS
1.	I	19TLC1	Language-Modern Literature பொதுத்தமிழ் - இக்கால இலக்கியம்	5	3	40	60	100
2.	II	19TLC2	Language - Bakthi Literature பொதுத்தமிழ் - பக்தி இலக்கியம்	5	3	40	60	100
3.	III	19TLC3	Language- Epic Literature பொதுத்தமிழ் - காப்பிய இலக்கியம்	5	3	40	60	100
4.	IV	19TLC4	Language-Sangam Literature பொதுத்தமிழ் - சங்க இலக்கியம;	5	3	40	60	100
			Total	20	12	160	240	400

PART – I – FRENCH

Offered by The Department of French

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19RLC1	PART 1 LANGUAGE FRENCH	5	3	40	60	100
2.	II	19RLC2	PART 1 LANGUAGE FRENCH	5	3	40	60	100
3.	III	19RLC3	PART 1 LANGUAGE FRENCH	5	3	40	60	100
4.	IV	19RLC4	PART 1 LANGUAGE FRENCH	5	3	40	60	100
			Total	20	12	160	240	400

PART – I – HINDI

Offered by The Department of Hindi

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19DLC1	PART 1 LANGUAGE HINDI	5	3	40	60	100
2.	II	19DLC2	PART 1 LANGUAGE HINDI	5	3	40	60	100
3.	III	19DLC3	PART 1 LANGUAGE HINDI	5	3	40	60	100
4.	IV	19DLC4	PART 1 LANGUAGE HINDI	5	3	40	60	100
			Total	20	12	160	240	400

PART – II -ENGLISH – 12 CREDITS

Offered by The Research Centre of English

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKS
1.	**I**	19EL1WB	BASIC COMMUNICATIVE ENGLISH	5	3	40	60	100
2.		19EL1WI	INTERMEDIATE COMMUNICATIVE ENGLISH	5	3	40	60	100
3.		19EL1WA	ADVANCED COMMUNICATIVE ENGLISH	5	3	40	60	100
4.	**II**	19EL2WB	ENGLISH COMMUNICATION SKILLS (BASIC)	5	3	40	60	100
5.		19EL2WI	ENGLISH FOR EMPOWERMENT (INTERMEDIATE)	5	3	40	60	100
6.		19EL2WA	ENGLISH FOR CREATIVE WRITING (ADVANCED)	5	3	40	60	100
7.	**III**	19EL3WN	ENGLISH FOR DIGITAL ERA	5	3	40	60	100
8.	**IV**	19EL4WN	ENGLISH FOR INTEGRATED DEVELOPMENT	5	3	40	60	100
			Total	**20**	**12**	**160**	**240**	**400**

PART – III -MAJOR, ALLIED & ELECTIVES – 95 CREDITS

MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS

S. NO	SEM	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19J1CC1	PROGRAMMING IN C	6	4	40	60	100
2.		19J1CC2	LAB IN C PROGRAMMING	6	3	40	60	100
3.	II	19J2CC3	OBJECT ORIENTED PROGRAMMING IN C++	6	4	40	60	100
4.		19J2CC4	LAB IN C++	6	3	40	60	100
5.	III	19J3CC5	OPERATING SYSTEMS	6	4	40	60	100
6.		19J3CC6	LAB IN RELATIONAL DATABASE MANAGEMENT SYSTEMS	6	3	40	60	100
7.	IV	19J4CC7	DATA STRUCTURES AND ALGORITHMS	6	4	40	60	100
8.		19J4CC8	LAB IN WEB PROGRAMMING	6	3	40	60	100
9.	V	19J5CC9	SOFTWARE ENGINEERING	5	5	40	60	100
10.		19J5CC10	JAVA PROGRAMMING	5	5	40	60	100
11.		19J5CC11	LAB IN JAVA PROGRAMMING	5	3	40	60	100
12.		19J5CC12	LAB IN DOT NET PROGRAMMING	5	3	40	60	100
13.	VI	19J6CC13	PYTHON	5	5	40	60	100
14.		19J6CC14	COMPUTER NETWORKS	5	5	40	60	100

15.		19J6CC15	LAB IN PYTHON	5	3	40	60	100
16.		19J6CC16	PROJECT		3	40	60	100

ALLIEDCOURSES- 20 CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19G1ACJ1	DISCRETE MATHEMATICS	5	5	40	60	100
2.	II	19G2ACJ2	OPERATIONS RESEARCH	5	5	40	60	100
3.	III	19AC3ACJ3	PRINCIPLES OF FINANCIAL ACCOUNTING AND ACCOUNTING PACKAGE	5	5	40	60	100
4.	IV	19P4ACJ4	DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION	5	5	40	60	100

ELECTIVES-15 CREDITS

S. No	SEM	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	V	19J5ME1 / 19J5ME2	CLOUD COMPUTING / MOBILE COMPUTING	5	5	40	60	100
2.	VI	19J6ME3 / 19J6ME4	SECURITY PRACTICES / DATA MINING	5	5	40	60	100
3.		19J6ME5 / 19J6ME6	INTERNET OF THINGS (IoT) / HUMAN COMPUTER INTERACTION	5	5	40	60	100

PART – IV – 20 CREDITS

- **VALUE EDUCATION**
- **ENVIRONMENTAL AWARENESS**

- **NON MAJOR ELECTIVE**
- **SKILL BASED COURSES**

S. No	SEM	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19G1VE	Value Education (Including Meditation in Action Movement)	1	1	40	60	100
2.		21J1NME	NON MAJOR ELECTIVE – I ANIMATION TOOLS AND TECHNIQUES	2	2	40	60	100
3.	II	19G2VE	Value Education	1	1	40	60	100
4.		21J2NME	NON MAJOR ELECTIVE – II ANIMATION TOOLS AND TECHNIQUES	2	2	40	60	100
5.	III	19G3EE	Environmental Education	1	1	40	60	100
6.		19J3SB1	SKILL BASED – I LOGICAL REASONING AND DATA INTERPRETATION	2	2	40	60	100
7.	IV	19G4EE	Environmental Education	1	1	40	60	100
8.		19J4SB2	SKILL BASED – II DATA ANALYSIS USING SPREADSHEETS	2	2	40	60	100
9.	V	19J5SB3	SKILL BASED – III LAB IN ANIMATION TECHNIQUES	2	2	40	60	100
10.		19J5SB4	SKILL BASED – IV LAB IN E – CONTENT DEVELOPMENT	2	2	40	60	100
11.	VI	19J6SB5	SKILL BASED – V LAB IN PHP	2	2	40	60	100
12.		19J6SB6	SKILL BASED – VI LAB IN LINUX	2	2	40	60	100

PART – V – 1CREDIT

OFF-CLASS PROGRAMME

ALL PART-V

Shift I

- Physical Education
- NSS
- NCC
- Women Empowerment Cell
- AICUF

Shift II

- Physical Education
- Rotaract
- Women Empowerment Cell
- AICUF
- Youth Red Cross / NSS

Kindly retain your respective Part V

OFF-CLASS PROGRAMME

ADD-ON COURSES

COURSE CODE	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
	COMPUTER APPLICATIONS (offered by The department of PGDCA for Shift I)	40	2	I & II	40	60	100
	ONLINE SELF LEARNING COURSE- Foundation Course for Arts	40	3	I	50	-	50
	ONLINE SELF LEARNING COURSE- Foundation Course for	40	3	II	50	-	50

COURSE CODE	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
	Science						
	ETHICAL STUDIES-Value Education	15	2	III-VI	50 each Semester	-	100
	HUMAN RIGHTS	15	2	V	-	-	100
	OUTREACH PROGRAMME- Reach Out to Society through Action **ROSA**	100	3	V & VI	-	-	100
	PROJECT	30	4	VI	40	60	100
	READING CULTURE	10/Semester	1	II-VI	-	-	-
	MOOC COURSES(Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM UGC / CEC	-	Minimum 2 Credits	-	-	-	
	TOTAL		22 +				

EXTRA CREDIT COURSE

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
19UGSLJ1	**SELF LEARNING COURSE for ADVANCED LEARNERS (offered for III UG)**	-	-	V	40	60	100

OFF CLASS PROGRAMMES

19UGVAJ1 - Crash Course
Android Application Development

19UGVAJ2 - Crash Course
E-Content Development

19UGVACJ1 - Certificate Course
Visual Basic – (Only for First Years – Compulsory)

I B.C.A

SEMESTER – I OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J1CC1	PROGRAMMING IN C	LECTURE	90	4

COURSE DESCRIPTION

To learn the basic knowledge of structured programming in C control structures, data structures and functions along with basic problem solving techniques.

COURSE OBJECTIVES

1. To acquire knowledge in algorithms and flowcharts
2. To learn the basic knowledge of structured programming in C
3. To solve problems through logical thinking

UNITS

UNIT I: INTRODUCTION TO COMPUTERS AND C FUNDAMENTALS (18 HRS)

Evolution of Computers – Generation of Computers – Classification of Computers – Characteristics of Computers– Advantages of Computers – Block Diagram of Digital Computer – Introduction to C – Simple C Programs – Character Set – Identifiers & Keywords – Data Types – Constant – Variables and Arrays – Declarations – Expressions – Statements – Symbolic Constants – Operators and Functions – Data Input and Output.

UNIT II: CONTROL STATEMENTS AND ARRAYS (18HRS)

Control Structures – Looping Structures – Program Structure – Definition and Processing of Arrays – Multi – dimensional Arrays – Arrays and Strings.

UNIT III: FUNCTIONS AND POINTERS (18HRS)

Functions – Declaration – Definition – Categories – Pointers Declaration – Passing Pointer to Function – Passing Function to another Function

UNIT IV: STRUCTURES AND UNIONS (18HRS)

Defining Structure – Processing a Structure – Structures and Pointers – Passing – Structure to Function – Self Referential Structure – Union

UNIT V: DATA FILES (18HRS)

Defining and Opening a File – Closing a File – Input Output Operations on Files – Error Handling during I/O Operations – Random Access Files– Command Line Arguments.

UNIT –VI DYNAMISM (Evaluation Pattern – CIA only)

Macros – Preprocessor Directives – DoS commands – Binary Files – Working C in Linux/Unix Environment – Usage of Compiler Shortcut Keys

REFERENCES:

1. Deitel H M and Deitel P J, C:How to Program, 5th Edition, Prentice Hall Publication, 2006.
2. E Balagurusamy, Programming with C, 7th Edition, Tata McGraw Hill Publication, 2017.
3. Byron Gottfried, Programming with C, Schaum Outline Series, 3rd Edition, McGrawHill Publication, 2016.
4. Yashwant Kanetkar, Let Us C, 13th Edition, BPB Publication, 2014

WEB REFERNCES :

1. https://www.javatpoint.com/c – programming – language – tutorial
2. https://www.tutorialspoint.com/cprogramming/
3. https://www.studytonight.com/c/

OER REFERENCES :

1. https://www.oercommons.org/authoring/14615-c-language/view
2. https://nptel.ac.in/courses/106/104/106104128/

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
Unit -1 Introduction to Computers and C Fundamentals				
1.1	Topic 1Evolution of Computers – Generation of Computers	2	Chalk & Talk	Black Board
1.2	Classification of Computers – Characteristics of Computers – Advantages of Computers	2	Chalk & Talk	LCD
1.3	Block Diagram of Digital Computer – Introduction to C – Simple C Programs – Character Set	4	Lecture	PPT & White board
1.4	Identifier & keywords – data types – constant	2	Lecture	Smart Board
1.5	Variables and Arrays – Declarations – Expressions	2	Lecture	Black Board
1.6	Statements – symbolic constants	2	Discussion	Google classroom
1.7	Operators and Functions	2	Lecture	Black Board
1.8	Data Input and Output	2	Discussion	Black Board
Unit -2 Control Statements and arrays				
2.1	Control structures – looping structures	2	Chalk & Talk	Black Board
2.2	Program Structure – Definition and Processing of Arrays	2	Chalk & Talk	LCD
2.3	Multi – dimensional Arrays	4	Lecture	PPT & White board
2.4	Arrays and Strings	2	Lecture	Smart Board
2.5	Variables and Arrays	2	Lecture	Black Board
2.6	Declarations – expressions	2	Discussion	Google

				classroom
2.7	Statements – symbolic constants	2	Lecture	Black Board
2.8	Operators and Functions Data Input and Output	2	Discussion	Black Board
Unit -3 functions and pointers				
3.1	Functions – declaration – definition	3	Chalk & Talk	Black Board
3.2	Categories	4	Chalk & Talk	LCD
3.3	Pointers declaration	4	Lecture	PPT & White board
3.4	Passing Pointer to Function	4	Lecture	Smart Board
3.5	Passing Function to another Function	3	Lecture	Black Board
Unit -4 structures and unions				
4.1	Defining structure	2	Chalk & Talk	Black Board
4.2	Structures and Pointers	2	Chalk & Talk	LCD
4.3	Passing	4	Lecture	PPT & White board
4.4	Structure to Function	2	Lecture	Smart Board
4.5	Self referential structure	2	Lecture	Black Board
4.6	Union	2	Discussion	Google classroom
UNIT -5 DATA FILES				
5.1	Defining and Opening a File	2	Chalk & Talk	Black Board

5.2	Closing a File	2	Chalk & Talk	LCD
5.3	Input Output Operations on Files	4	Lecture	PPT & White board
5.4	Error Handling during I/O Operations	2	Lecture	Smart Board
5.5	Random access files	2	Lecture	Black Board
5.6	Command line arguments	2	Discussion	Google classroom

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks

C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Acquire basic understanding of C programming	**K1**	**PSO1, PSO2**
CO 2	Illustrate how arrays and strings are implemented in C	**K2**	**PSO1, PSO2,PSO3**
CO 3	Utilize the knowledge of Functions and Pointers	**K2**	**PSO3, PSO4**
CO 4	Analyze the memory management concept in C using structure and Unions	**K4**	**PSO4, PSO5**
CO 5	Outline the file operations in C	**K4**	**PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO1	**3**	**3**	**1**	**2**	**1**	**1**	**1**	**2**	**2**	**1**
CO2	**3**	**3**	**3**	**2**	**1**	**1**	**1**	**2**	**1**	**1**
CO3	**2**	**2**	**3**	**3**	**2**	**1**	**1**	**2**	**1**	**2**
CO4	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**1**	**1**
CO5	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**1**	**1**

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

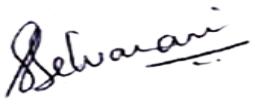
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



(S.Selvarani)

10%

I B.C.A

SEMESTER – I NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J1CC1	PROGRAMMING IN C	LECTURE	90	4

COURSE DESCRIPTION

To learn the basic knowledge of structured programming in C control structures, data structures and functions along with basic problem solving techniques.

COURSE OBJECTIVES

4. To acquire knowledge in algorithms and flowcharts
5. To learn the basic knowledge of structured programming in C
6. To solve problems through logical thinking

UNITS

UNIT I:INTRODUCTION TO COMPUTERS AND C FUNDAMENTALS (18 HRS)

Evolution of Computers – Generation of Computers – Classification of Computers – Characteristics of Computers– Advantages of Computers – Block Diagram of Digital Computer – Introduction to C – Simple C Programs – Character Set – Identifiers & Keywords – Data Types – Constant – Variables and Arrays – Declarations – Expressions – Statements – Symbolic Constants – Operators and Functions – Data Input and Output.

UNIT II: CONTROL STATEMENTS AND ARRAYS (18HRS)

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UNIT III: FUNCTIONS AND POINTERS (18HRS)

Functions – Declaration – Definition – Categories – Pointers Declaration – Passing Pointer to Function – Passing Function to another Function

UNIT IV: STRUCTURES AND UNIONS (18HRS)

Defining Structure – Processing a Structure – Structures and Pointers – Passing – Structure to Function – Self Referential Structure – Union

UNIT V: DATA FILES (18HRS)

Defining and Opening a File – Closing a File – Input Output Operations on Files – Error Handling during I/O Operations – Random Access Files– Retrieving and storing data in to file - Command Line Arguments.

UNIT –VI DYNAMISM (Evaluation Pattern – CIA only)

Macros – Preprocessor Directives – DoS commands – Binary Files – Working C in Linux/Unix Environment – Usage of Compiler Shortcut Keys

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5. Deitel H M and Deitel P J, C:How to Program, 5th Edition, Prentice Hall Publication, 2006.
6. E Balagurusamy, Programming with C, 7th Edition, Tata McGraw Hill Publication, 2017.
7. Byron Gottfried, Programming with C, Schaum Outline Series, 3rd Edition, McGrawHill Publication, 2016.
8. Yashwant Kanetkar, Let Us C, 13th Edition, BPB Publication, 2014

WEB REFERNCES :

4. https://www.javatpoint.com/c – programming – language – tutorial
5. https://www.tutorialspoint.com/cprogramming/
6. https://www.studytonight.com/c/

OER REFERENCES :

3. https://www.oercommons.org/authoring/14615-c-language/view
4. https://nptel.ac.in/courses/106/104/106104128/

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
Unit -1 Introduction to Computers and C Fundamentals				
1.1	Topic 1Evolution of Computers – Generation of Computers	2	Chalk & Talk	Black Board
1.2	Classification of Computers – Characteristics of Computers – Advantages of Computers	2	Chalk & Talk	LCD
1.3	Block Diagram of Digital Computer – Introduction to C – Simple C Programs – Character Set	4	Lecture	PPT & White board
1.4	Identifier & keywords – data types – constant	2	Lecture	Smart Board
1.5	Variables and Arrays – Declarations – Expressions	2	Lecture	Black Board
1.6	Statements – symbolic constants	2	Discussion	Google classroom
1.7	Operators and Functions	2	Lecture	Black Board
1.8	Data Input and Output	2	Discussion	Black Board
Unit -2 Control Statements and arrays				
2.1	Control structures – looping structures	2	Chalk & Talk	Black Board
2.2	Program Structure – Definition and Processing of Arrays	2	Chalk & Talk	LCD
2.3	Multi – dimensional Arrays	4	Lecture	PPT & White board
2.4	Arrays and Strings	2	Lecture	Smart Board
2.5	Variables and Arrays	2	Lecture	Black Board
2.6	Declarations – expressions	2	Discussion	Google

				classroom
2.7	Statements – symbolic constants	2	Lecture	Black Board
2.8	Operators and Functions Data Input and Output	2	Discussion	Black Board
Unit -3 functions and pointers				
3.1	Functions – declaration – definition	3	Chalk & Talk	Black Board
3.2	Categories	4	Chalk & Talk	LCD
3.3	Pointers declaration	4	Lecture	PPT & White board
3.4	Passing Pointer to Function	4	Lecture	Smart Board
3.5	Passing Function to another Function	3	Lecture	Black Board
Unit -4 structures and unions				
4.1	Defining structure	2	Chalk & Talk	Black Board
4.2	Structures and Pointers	2	Chalk & Talk	LCD
4.3	Passing	4	Lecture	PPT & White board
4.4	Structure to Function	2	Lecture	Smart Board
4.5	Self referential structure	2	Lecture	Black Board
4.6	Union	2	Discussion	Google classroom
UNIT -5 DATA FILES				
5.1	Defining and Opening a File	2	Chalk & Talk	Black Board

5.2	Closing a File	2	Chalk & Talk	LCD
5.3	Input Output Operations on Files	4	Lecture	PPT & White board
5.4	Error Handling during I/O Operations	2	Lecture	Smart Board
5.5	Random access files	2	Lecture	Black Board
5.6	Command line arguments	2	Discussion	Google classroom

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks

C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Acquire basic understanding of C programming	**K1**	**PSO1, PSO2**
CO 2	Illustrate how arrays and strings are implemented in C	**K2**	**PSO1, PSO2,PSO3**
CO 3	Utilize the knowledge of Functions and Pointers	**K2**	**PSO3, PSO4**
CO 4	Analyze the memory management concept in C using structure and Unions	**K4**	**PSO4, PSO5**
CO 5	Outline the file operations in C	**K4**	**PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10
CO1	**3**	**3**	**1**	**2**	**1**	**1**	**1**	**2**	**2**	**1**
CO2	**3**	**3**	**3**	**2**	**1**	**1**	**1**	**2**	**1**	**1**
CO3	**2**	**2**	**3**	**3**	**2**	**1**	**1**	**2**	**1**	**2**
CO4	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**1**	**1**
CO5	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**1**	**1**

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

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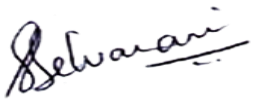

(S.Selvarani)

I B.C.A

SEMESTER – I OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
USCA	19J1CC2	LAB IN C PROGRAMMING	PRACTICAL	6	3

COURSE DESCRIPTION

To learn the practical implementation of structured programming using control structures, data structures and functions along with basic problem solving techniques.

COURSE OBJECTIVES

1. To learn problem solving through procedural language programming technique
2. To understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
3. To develop programming skills in C.

PROGRAM LIST:

1. Write Simple Programs to implement procedural language.
2. Write a C Program to implement Conditional statements.
3. Write a C Program to implement looping statements.
4. Write a C Program to implement arrays.
5. Write a C Program to implement Functions.
6. Write a C Program to implement Pointers.
7. Write a C Program to implement Structures.
8. Write a C Program to implement Union.
9. Write a C Program to implement Files.
10. Write a C Program using Command line Arguments.

WEB REFERENCES:

1. https://www.tutorials.com/cprogramming/
2. https://www.cprogramming.com/tutorial/c–tutorial.html

OER REFERENCES:

https://youtu.be/JUH1ivQvvnY

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
LAB IN C PROGRAMMING				
1.1	Implement procedural language	10	Demo & Working in Lab	LCD
1.2	Conditional statements	10	Demo & Working in Lab	LCD
1.3	Looping statements	10	Demo & Working in Lab	LCD
1.4	Arrays	10	Demo & Working in Lab	LCD
1.5	Functions	10	Demo & Working in Lab	LCD
1.6	Pointers	10	Demo & Working in Lab	LCD
1.7	Structures	10	Demo & Working in Lab	LCD
1.8	Union	10	Demo & Working in Lab	LCD
1.9	Command line Arguments	10	Demo & Working in Lab	LCD

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Acquire basic understanding of C programming	K1	PSO1, PSO2
CO 2	Illustrate how arrays and strings are implemented in C	K2	PSO1, PSO2,PSO3
CO 3	Utilize the knowledge of Functions and Pointers	K2	PSO3, PSO4
CO 4	Analyze the memory management concept in C using structure and	K4	PSO4, PSO5

	Unions		
CO 5	Outline the file operations in C	**K4**	**PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	2	1	1	1	2	1	1
CO2	3	3	3	2	1	1	1	2	1	1
CO3	2	2	3	3	1	1	1	2	1	1
CO4	2	2	2	3	3	1	2	2	1	1
CO5	2	2	2	2	3	3	2	2	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

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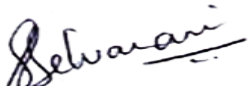


(S.Selvarani)

10%

I B.C.A

SEMESTER – I NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
USCA	19J1CC2	LAB IN C PROGRAMMING	PRACTICAL	6	3

COURSE DESCRIPTION

To learn the practical implementation of structured programming using control structures, data structures and functions along with basic problem solving techniques.

COURSE OBJECTIVES

4. To learn problem solving through procedural language programming technique
5. To understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
6. To develop programming skills in C.

PROGRAM LIST:

1. Write Simple Programs to implement procedural language.
2. Write a C Program to implement Conditional statements.
3. Write a C Program to implement looping statements.
4. Write a C Program to implement arrays.
5. Write a C Program to implement Functions.
6. Write a C Program to implement Pointers.
7. Write a C Program to implement Structures.
8. Write a C Program to implement Union.
9. Write a C Program to implement Files.
10. Write a C Program using Command line Arguments.
11. Write a C Program to store patients' details using files.

WEB REFERENCES:

3. https://www.tutorials.com/cprogramming/
4. https://www.cprogramming.com/tutorial/c–tutorial.html

OER REFERENCES:

https://youtu.be/JUH1ivQvvnY

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
LAB IN C PROGRAMMING				
1.1	Implement procedural language	10	Demo & Working in Lab	LCD
1.2	Conditional statements	10	Demo & Working in Lab	LCD
1.3	Looping statements	10	Demo & Working in Lab	LCD
1.4	Arrays	10	Demo & Working in Lab	LCD
1.5	Functions	10	Demo & Working in Lab	LCD
1.6	Pointers	10	Demo & Working in Lab	LCD
1.7	Structures	10	Demo & Working in Lab	LCD
1.8	Union	10	Demo & Working in Lab	LCD
1.9	Command line Arguments	10	Demo & Working in Lab	LCD

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Acquire basic understanding of C programming	K1	PSO1, PSO2
CO 2	Illustrate how arrays and strings are implemented in C	K2	PSO1, PSO2,PSO3
CO 3	Utilize the knowledge of Functions and Pointers	K2	PSO3, PSO4
CO 4	Analyze the memory management concept in C using structure and	K4	PSO4, PSO5

	Unions		
CO 5	Outline the file operations in C	**K4**	**PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	2	1	1	1	2	1	1
CO2	3	3	3	2	1	1	1	2	1	1
CO3	2	2	3	3	1	1	1	2	1	1
CO4	2	2	2	3	3	1	2	2	1	1
CO5	2	2	2	2	3	3	2	2	1	1

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

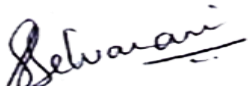
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



(S.Selvarani)

I B.C.A

SEMESTER – II OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J2CC3	OBJECT ORIENTED PROGRAMMING IN C++	LECTURE	**90**	**4**

COURSE DESCRIPTION

To get better understanding in the OOPS Concept and to have basic knowledge in writing programs using C++ Programming

COURSE OBJECTIVES

1. To introduce Object Oriented Programming concepts using C++ and improve OOP Skills.
2. To understand the concepts of inheritance and polymorphism
3. To get expertise in function overloading and operator overloading concepts
4. To analyze the different searching and sorting techniques

UNITS

UNIT I: INTRODUCTION TO C++ (18 HRS)

Principles of Object Oriented Programming, Beginning with C++, Tokens, Expressions and Control Structures: Introduction – Tokens – keywords – Identifiers and constants – Basic data types – user defined data type – Storage classes – derived data type – symbolic constants – type compatibility – declaration of variables – Dynamic Initialization of variables – Reference Variables – Operators in C++ – Scope resolution Operator – Member Dereferencing Operator – Memory management Operator – Manipulators – Type cast operator – Expressions and their Types – Special assignment expressions – Implicit conversions – Control Structures

UNIT II: FUNCTIONS IN C++ (18 HRS)

Functions in C++: The Main Function – Function Prototyping – Call by Reference – Return by reference Inline function – Default Arguments – Constant arguments – Recursion – Function Overloading – Friend and Virtual functions – Classes and Objects: Introduction – C Structures Revisited Specifying a class – Defining Member functions – A C++ Program with Class – Making an Outside

function Inline – Nesting of member functions – Private member functions – Arrays within a class – Memory allocation for objects – Static data members – Static member functions – Array of Objects – Objects as function Arguments – Friendly functions – Returning Objects

UNIT III: CONSTRUCTORS AND DESTRUCTORS (18 HRS)

Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors in Class – constructors with default arguments – Dynamic initialization of objects – Copy constructors – Dynamic Constructors – const Objects – Destructors. Operator overloading and type conversion: Defining operator overloading – overloading unary operators – overloading binary operators – using friend function.

UNIT IV: INHERITANCE (18 HRS)

Inheritance: Extending Classes Introduction – defining derived classes – single inheritance – Making a Private Member Inheritable – Multiple Inheritance – Multilevel Inheritance – Hierarchical inheritance – Hybrid Inheritance – Virtual Base classes – Abstract Classes – Constructor in Derived Classes – Member Classes: Nesting of Classes.

UNIT V: FILES (18 HRS)

Working with Files: Classes for file stream operations – opening and closing files – detecting end – of – file – More about Open (): file modes – file pointers and their manipulations – sequential I/P and O/P operations – updating a file: Random Access.

UNIT VI: DYNAMISM

Command Line Arguments – Dynamic Constructor in C++ – C++Projects – Diamond Problem in Inheritance – Standard Template Library (STL)

REFERENCE BOOKS:

1. E Balagurusamy, Object Oriented Programming with C++, VI Edition, Tata McGraw – Hill, 2016
2. Alfred V Aho, John E Hopcroft, Jeffrey D Ullman; Data Structures and Algorithms, Pearson Education, 2013

WEB REFERNECES :

1. https://www.tutorialspoint.com/cplusplus
2. https://www.cplusplus.com
3. https://www.javapoint.com/cpp–tutorial

OER REFERENCES :

1. https://www.oercommons.org/authoring/14616-c/view

	data type – Storage classes – derived data type			White board
1.4	Symbolic constants – type compatibility – declaration of variables –Dynamic Initialization of variables	2	Lecture	Smart Board
1.5	Importing Pictures	2	Lecture	Black Board
1.6	Animation (Key Frame, Straight Line, User Defined Path)	2	Discussion	Google classroom
1.7	Reference Variables – Operators in C++ – Scope resolution Operator	2	Lecture	Black Board
1.8	Member Dereferencing Operator – Memory management Operator – Manipulators – Type cast operator	2	Discussion	Black Board
1.9	Expressions and their Types – Special assignment expressions – Implicit conversions – Control Structures	2	Discussion	Black Board
UNIT-2 FUNCTIONS IN C++				
2.1	The Main Function – Function Prototyping – Call by Reference – Return by reference Inline function	2	Chalk & Talk	Black Board
2.2	Default Arguments – Constant arguments – Recursion – Function Overloading	2	Chalk & Talk	LCD
2.3	Friend and Virtual functionS	2	Lecture	PPT & White board
2.4	C Structures Revisited Specifying a class – Defining	2	Lecture	Smart

	Member functions – A C++ Program with Class			Board
2.5	Making an Outside function Inline – Nesting of member functions	2	Lecture	Black Board
2.6	Private member functions – Arrays within a class – Memory allocation for objects	2	Discussion	Google classroom
2.7	Static data members – Static member functions	2	Lecture	Black Board
2.8	Array of Objects – Objects as function Arguments	2	Discussion	Black Board
2.9	Friendly functions – Returning Objects	2	Discussion	Black Board
UNIT -3 CONSTRUCTORS AND DESTRUCTORS				
31	Constructors – Parameterized Constructors	3	Chalk & Talk	Black Board
3.2	Multiple Constructors in Class – constructors with default arguments	3	Chalk & Talk	LCD
3.3	Dynamic initialization of objects – copy constructors	3	Lecture	PPT & White board
3.4	Dynamic Constructors – const Objects – Destructors	3	Lecture	Smart Board
3.5	Defining operator overloading – overloading unary operators	3	Lecture	Black Board
3.6	Overloading binary operators – using friend function.	3	Lecture	Black Board
UNIT -4 INHERITANCE				
4.1	Extending Classes Introduction – defining derived classes	3	Chalk & Talk	Black Board
4.2	single inheritance – Making a Private Member Inheritable	3	Chalk & Talk	LCD

4.3	Multiple Inheritance – Multilevel Inheritance	3	Lecture	PPT & White board
4.4	Hierarchical inheritance – Hybrid Inheritance	3	Lecture	Smart Board
4.5	Virtual Base classes – Abstract Classes	3	Lecture	Black Board
4.6	Constructor in Derived Classes – Member Classes: Nesting of Classes	3	Discussion	Google classroom
UNIT -5 FILES				
5.1	Opening and closing files	3	Chalk & Talk	Black Board
5.2	Detecting end – of – file – More about Open ()	3	Chalk & Talk	LCD
5.3	File modes – file pointers and their manipulations	3	Lecture	PPT & White board
5.4	Sequential I/P and O/P operations	3	Lecture	Smart Board
5.5	Updating a file: Random Access	3	Lecture	Black Board
5.6	Error handling during file operations.	3	Discussion	Google classroom

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %

K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Assess the object – oriented concepts in C++	**K1**	**PSO1, PSO2**
CO 2	Illustrate the usage of Functions in C++	**K1 & K2**	**PSO1, PSO2,PSO3**
CO 3	Analyze advanced features of C++ specifically stream I/O and overloading	**K1 & K2**	**PSO3, PSO4**
CO 4	Demonstrate on Inheritance and Virtual Classes	**K1, K2, K3 & K4**	**PSO4, PSO5**
CO 5	Outline the file operations in C++	**K2, K3 & K4**	**PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10

CO1	**3**	**3**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
CO2	**3**	**3**	**3**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
CO3	**2**	**2**	**3**	**3**	**2**	**1**	**2**	**2**	**1**	**1**
CO4	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**2**	**1**
CO5	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**1**	**2**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**1**	**1**	**1**	**1**
CO2	**1**	**1**	**3**	**1**	**2**
CO3	**1**	**2**	**1**	**3**	**1**
CO4	**1**	**1**	**1**	**1**	**1**
CO5	**1**	**1**	**1**	**1**	**1**

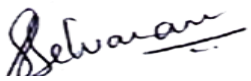
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



(S.Selvarani)

I B.C.A

SEMESTER – II

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
USCA	19J2CC4	LAB IN C++	PRACTICAL	6	3

10%

I B.C.A

SEMESTER – II NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J2CC3	OBJECT ORIENTED PROGRAMMING IN C++	LECTURE	**90**	**4**

COURSE DESCRIPTION

To get better understanding in the OOPS Concept and to have basic knowledge in writing programs using C++ Programming

COURSE OBJECTIVES

5. To introduce Object Oriented Programming concepts using C++ and improve OOP Skills.
6. To understand the concepts of inheritance and polymorphism
7. To get expertise in function overloading and operator overloading concepts
8. To analyze the different searching and sorting techniques

UNITS

UNIT I: INTRODUCTION TO C++ (18 HRS)

Principles of Object Oriented Programming, Beginning with C++, Tokens, Expressions and Control Structures: Introduction – Tokens – keywords – Identifiers and constants – Basic data types – user defined data type – Storage classes – derived data type – symbolic constants – type compatibility – declaration of variables – Dynamic Initialization of variables – Reference Variables – Operators in C++ – Scope resolution Operator – Member Dereferencing Operator – Memory management Operator – Manipulators – Type cast operator – Expressions and their Types – Special assignment expressions – Implicit conversions – Control Structures

UNIT II: FUNCTIONS IN C++ (18 HRS)

Functions in C++: The Main Function – Function Prototyping – Call by Reference – Return by reference Inline function – Default Arguments – Constant arguments – Recursion – Function Overloading – Friend and Virtual functions

– Classes and Objects: Introduction – C Structures Revisited Specifying a class – Defining Member functions – A C++ Program with Class – Making an Outside function Inline – Nesting of member functions – Private member functions – Arrays within a class – Memory allocation for objects – Static data members – Static member functions – Array of Objects – Objects as function Arguments – Friendly functions – Returning Objects

UNIT III: CONSTRUCTORS AND DESTRUCTORS (18 HRS)

Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors in Class – constructors with default arguments – Dynamic initialization of objects – Copy constructors – Dynamic Constructors – const Objects – Destructors. Operator overloading and type conversion: Defining operator overloading – overloading unary operators – overloading binary operators – using friend function.

UNIT IV: INHERITANCE (18 HRS)

Inheritance: Extending Classes Introduction – defining derived classes – single inheritance – Making a Private Member Inheritable – Multiple Inheritance – Multilevel Inheritance – Hierarchical inheritance – Hybrid Inheritance – Virtual Base classes – Abstract Classes – Constructor in Derived Classes – Member Classes: Nesting of Classes.

UNIT V: FILES (18 HRS)

Working with Files: Classes for file stream operations – opening and closing files – detecting end – of – file – More about Open (): file modes – file pointers and their manipulations – sequential I/P and O/P operations – updating a file: Random Access – Error handling during file operations.

UNIT VI: DYNAMISM

Command Line Arguments – Dynamic Constructor in C++ – C++Projects – Diamond Problem in Inheritance – Standard Template Library (STL)

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WEB REFERNECES :

4. https://www.tutorialspoint.com/cplusplus
5. https://www.cplusplus.com
6. https://www.javapoint.com/cpp–tutorial

OER REFERENCES :

1. https://www.oercommons.org/authoring/14616-c/view

	data type – Storage classes – derived data type			White board
1.4	Symbolic constants – type compatibility – declaration of variables –Dynamic Initialization of variables	2	Lecture	Smart Board
1.5	Importing Pictures	2	Lecture	Black Board
1.6	Animation (Key Frame, Straight Line, User Defined Path)	2	Discussion	Google classroom
1.7	Reference Variables – Operators in C++ – Scope resolution Operator	2	Lecture	Black Board
1.8	Member Dereferencing Operator – Memory management Operator – Manipulators – Type cast operator	2	Discussion	Black Board
1.9	Expressions and their Types – Special assignment expressions – Implicit conversions – Control Structures	2	Discussion	Black Board
UNIT-2 FUNCTIONS IN C++				
2.1	The Main Function – Function Prototyping – Call by Reference – Return by reference Inline function	2	Chalk & Talk	Black Board
2.2	Default Arguments – Constant arguments – Recursion – Function Overloading	2	Chalk & Talk	LCD
2.3	Friend and Virtual functionS	2	Lecture	PPT & White board
2.4	C Structures Revisited Specifying a class – Defining	2	Lecture	Smart

	Member functions – A C++ Program with Class			Board
2.5	Making an Outside function Inline – Nesting of member functions	2	Lecture	Black Board
2.6	Private member functions – Arrays within a class – Memory allocation for objects	2	Discussion	Google classroom
2.7	Static data members – Static member functions	2	Lecture	Black Board
2.8	Array of Objects – Objects as function Arguments	2	Discussion	Black Board
2.9	Friendly functions – Returning Objects	2	Discussion	Black Board
UNIT -3 CONSTRUCTORS AND DESTRUCTORS				
31	Constructors – Parameterized Constructors	3	Chalk & Talk	Black Board
3.2	Multiple Constructors in Class – constructors with default arguments	3	Chalk & Talk	LCD
3.3	Dynamic initialization of objects – copy constructors	3	Lecture	PPT & White board
3.4	Dynamic Constructors – const Objects – Destructors	3	Lecture	Smart Board
3.5	Defining operator overloading – overloading unary operators	3	Lecture	Black Board
3.6	Overloading binary operators – using friend function.	3	Lecture	Black Board
UNIT -4 INHERITANCE				
4.1	Extending Classes Introduction – defining derived classes	3	Chalk & Talk	Black Board
4.2	single inheritance – Making a Private Member Inheritable	3	Chalk & Talk	LCD

4.3	Multiple Inheritance – Multilevel Inheritance	3	Lecture	PPT & White board
4.4	Hierarchical inheritance – Hybrid Inheritance	3	Lecture	Smart Board
4.5	Virtual Base classes – Abstract Classes	3	Lecture	Black Board
4.6	Constructor in Derived Classes – Member Classes: Nesting of Classes	3	Discussion	Google classroom
UNIT -5 FILES				
5.1	Opening and closing files	3	Chalk & Talk	Black Board
5.2	Detecting end – of – file – More about Open ()	3	Chalk & Talk	LCD
5.3	File modes – file pointers and their manipulations	3	Lecture	PPT & White board
5.4	Sequential I/P and O/P operations	3	Lecture	Smart Board
5.5	Updating a file: Random Access	3	Lecture	Black Board
5.6	Error handling during file operations.	3	Discussion	Google classroom

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %

K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Assess the object – oriented concepts in C++	**K1**	**PSO1, PSO2**
CO 2	Illustrate the usage of Functions in C++	**K1 & K2**	**PSO1, PSO2,PSO3**
CO 3	Analyze advanced features of C++ specifically stream I/O and overloading	**K1 & K2**	**PSO3, PSO4**
CO 4	Demonstrate on Inheritance and Virtual Classes	**K1, K2, K3 & K4**	**PSO4, PSO5**
CO 5	Outline the file operations in C++	**K2, K3 & K4**	**PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10

CO1	**3**	**3**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
CO2	**3**	**3**	**3**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
CO3	**2**	**2**	**3**	**3**	**2**	**1**	**2**	**2**	**1**	**1**
CO4	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**2**	**1**
CO5	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**1**	**2**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**1**	**1**	**1**	**1**
CO2	**1**	**1**	**3**	**1**	**2**
CO3	**1**	**2**	**1**	**3**	**1**
CO4	**1**	**1**	**1**	**1**	**1**
CO5	**1**	**1**	**1**	**1**	**1**

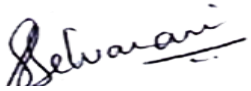
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



I B.C.A

SEMESTER – II OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
USCA	19J2CC4	LAB IN C++ PROGRAMMING	PRACTICAL	6	3

COURSE DESCRIPTION

To learn the basic knowledge of Object-Oriented Programming in C++ and write code in all aspects of C++ Language.

COURSE OBJECTIVES

1. To develop object oriented programming skills using C++.
2. To learn how to design C++ classes for code reuse.
3. To learn how to implement Constructors, Overloading and Polymorphism concepts.
4. To learn how object oriented and virtual functions implement dynamic binding with polymorphism.

PROGRAM LIST:

1. Write a C++ Program to implement Conditional statements.
2. Write a C++ Program to implement looping statements.
3. Write a C++ Program to implement arrays.
4. Write a C++ Program to implement Classes and objects.
5. Write a C++ Program to implement array of objects.
6. Write a C++ Program to implement constructor and destructor.
7. Write a C++ Program to implement Unary Operator overloading.
8. Write a C++ Program to implement Binary Operator overloading.
9. Write a C++ Program to implement Inheritance.
10. Write a C++ Program using Files

WEB REFERENCES :

1. https://www.tutorialspoint.com/cplusplus

2. https://www.cplusplus.com

OER REFERENCES :

https://onlinecourses.nptel.ac.in/noc21_cs02/preview

LAB IN C++				
1.1	Conditional statements	4	Demo & Lab	LCD
1.2	Looping statements	4	Demo & Lab	LCD
1.3	Arrays.	4	Demo & Lab	LCD
1.4	Classes and objects.	4	Demo & Lab	LCD
1.5	Array of objects	4	Demo & Lab	LCD
1.6	Constructor and destructor	1	Demo & Lab	LCD
1.7	Unary Operator overloading	3	Demo & Lab	LCD
1.8	Binary Operator overloading	3	Demo & Lab	LCD
1.9	Inheritance, Files	3	Demo & Lab	LCD

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**

10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Read, understand and trace the execution of programs written in C++ language	**K1**	**PSO1, PSO2**
CO 2	Demonstrate class and object functions	**K1 & K2**	**PSO1, PSO2,PSO3**
CO 3	Assess operator overloading and function overloading to specific problem definition	**K1 & K2**	**PSO3, PSO4**
CO 4	Demonstrate file operations in C++.	**K1, K2, K3 & K4**	**PSO4, PSO5**
CO 5	Write C++ code to demonstrate each	**K2, K3 & K4**	**PSO5, PSO6**

	concept		

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	1	1	1	1	2	1	1
CO2	3	3	3	1	1	1	1	2	1	1
CO3	2	2	3	3	2	1	2	2	1	1
CO4	2	2	2	3	3	1	2	2	2	1
CO5	2	2	2	2	3	3	2	2	1	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

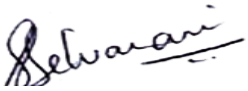
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



(S.Selvarani)

I B.C.A

SEMESTER – I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/	CREDITS

10%

I B.C.A

SEMESTER – II NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
USCA	19J2CC4	LAB IN C++ PROGRAMMING	PRACTICAL	6	3

COURSE DESCRIPTION

To learn the basic knowledge of Object-Oriented Programming in C++ and write code in all aspects of C++ Language.

COURSE OBJECTIVES

5. To develop object oriented programming skills using C++.
6. To learn how to design C++ classes for code reuse.
7. To learn how to implement Constructors, Overloading and Polymorphism concepts.
8. To learn how object oriented and virtual functions implement dynamic binding with polymorphism.

PROGRAM LIST:

11. Write a C++ Program to implement Conditional statements.
12. Write a C++ Program to implement looping statements.
13. Write a C++ Program to implement arrays.
14. Write a C++ Program to implement Classes and objects.
15. Write a C++ Program to implement array of objects.
16. Write a C++ Program to implement constructor and destructor.
17. Write a C++ Program to implement Unary Operator overloading.
18. Write a C++ Program to implement Binary Operator overloading.
19. Write a C++ Program to implement Inheritance.
20. Write a C++ Program using Files
21. Write a C++ Program to handle errors in files.

WEB REFERENCES :

3. https://www.tutorialspoint.com/cplusplus
4. https://www.cplusplus.com

OER REFERENCES :

https://onlinecourses.nptel.ac.in/noc21_cs02/preview

LAB IN C++				
1.1	Conditional statements	4	Demo & Lab	LCD
1.2	Looping statements	4	Demo & Lab	LCD
1.3	Arrays.	4	Demo & Lab	LCD
1.4	Classes and objects.	4	Demo & Lab	LCD
1.5	Array of objects	4	Demo & Lab	LCD
1.6	Constructor and destructor	1	Demo & Lab	LCD
1.7	Unary Operator overloading	3	Demo & Lab	LCD
1.8	Binary Operator overloading	3	Demo & Lab	LCD
1.9	Inheritance, Files	3	Demo & Lab	LCD

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**

10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Read, understand and trace the execution of programs written in C++ language	**K1**	**PSO1, PSO2**
CO 2	Demonstrate class and object functions	**K1 & K2**	**PSO1, PSO2,PSO3**
CO 3	Assess operator overloading and function overloading to specific problem definition	**K1 & K2**	**PSO3, PSO4**
CO 4	Demonstrate file operations in C++.	**K1, K2, K3 & K4**	**PSO4, PSO5**
CO 5	Write C++ code to demonstrate each	**K2, K3 & K4**	**PSO5, PSO6**

	concept		

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	1	1	1	1	2	1	1
CO2	3	3	3	1	1	1	1	2	1	1
CO3	2	2	3	3	2	1	2	2	1	1
CO4	2	2	2	3	3	1	2	2	2	1
CO5	2	2	2	2	3	3	2	2	1	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

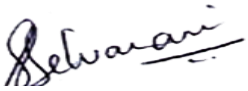
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



(S.Selvarani)

I B.C.A

SEMESTER – I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/	CREDITS

II B.C.A

SEMESTER – III OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J3CC5	OPERATING SYSTEMS	LECTURE	6	4

COURSE DESCRIPTION

To Study about the concepts, structure and mechanisms of operating systems. To examine the operations of processes and threads, scheduling, deadlock, memory management and file systems.

COURSE OBJECTIVES

1. To have in–depth knowledge about the functionalities of the operating systems.
2. To learn the mechanisms of OS to handle processes and threads and their communication.
3. To learn the mechanisms involved in memory management
4. To gain knowledge on distributed operating system concepts
5.

UNIT I: PROCESSES (18 HRS)

Introduction: Definition, Main frame System, Multiprocessor System, Distributed systems – Process: Process concept, Process scheduling.

UNIT II: CPU SCHEDULING, PROCESS SYNCHRONIZATION (18 HRS)

CPU Scheduling: Basic concepts – scheduling criteria – Scheduling algorithms – Process Synchronization: Background – the critical section problem, Semaphores – Usage, Monitors.

UNIT III: DEADLOCK (18 HRS)

Deadlock and Starvation – Binary Semaphore – System model – deadlock

characterization – methods for handling deadlocks – deadlock prevention – deadlock avoidance – deadlock deduction – recovery from deadlock

UNIT IV: MEMORY MANAGEMENT (18 HRS)

Background – Swapping, Contiguous Memory Allocations, Paging, Segmentation, Segmentation with paging. Background – demand paging – Page Replacement Algorithms – allocation of frames – thrashing

UNIT V: FILESYSTEM CONCEPTS (18 HRS)

File concept – access methods – directory structures – protection – File system structure – allocation methods.

UNIT VI: DYNAMISM

Distributed shared memory (DSM) –Kernel Programming – Memory Partitioning – Linux Basic Commands – Problems in Job Scheduling Algorithms

REFERENCE BOOKS:

1. Deitel H.M, Operating System, 7th Edition, Pearson Education, 1996
2. Silberscahatz Galvin Gagne, Operating System Concept, VI Edition, John Wiley's Sons, 2010.
3. Operating System, Concept & Design, II Edition,2001 TATA McGraw – Hill.
4. Abraham Silberschatz, Peter Baer Galvin, Operating System Concepts, VII Edition ,2014.

WEB REFERENCES :

1. http://Williamstallings.com/os/animations
2. https://www.tutorial.com/operating_system/

OER REFERENCES :

1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=7
2. https://greenteapress.com/thinkos/index.html

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT 1: PROCESSES				
1.1	Definition	3	Chalk & Talk	Black Board
1.2	Main frame System	3	Chalk & Talk	LCD
1.3	Multiprocessor System	3	Lecture	PPT & White board
1.4	Distributed systems – Process	3	Lecture	Smart Board
1.5	Process concept	3	Lecture	Black Board
1.6	Process scheduling	3	Discussion	Google classroom
UNIT 2: CPU SCHEDULING, PROCESS SYNCHRONIZATION				
2.1	Basic concepts – scheduling criteria	3	Chalk & Talk	Black Board
2.2	Scheduling algorithms – Process Synchronization	3	Chalk & Talk	LCD
2.3	Background	3	Lecture	PPT & White board
2.4	The critical section problem	3	Lecture	Smart Board
2.5	Semaphores	3	Lecture	Black Board
2.6	Usage, Monitors	3	Discussion	Google classroom
UNIT -3 DEADLOCK				
31	Deadlock and Starvation	2	Chalk &	Black

			Talk	Board
3.2	Binary Semaphore	2	Chalk & Talk	LCD
3.3	System model – deadlock characterization	3	Lecture	PPT & White board
3.4	methods for handling deadlocks	3	Lecture	Smart Board
3.5	Deadlock Prevention	2	Lecture	Black Board
3.6	Deadlock Avoidance	2	Lecture	Black Board
3.7	Deadlock Deduction	2	Lecture	Black Board
3.8	Recovery from Deadlock	2	Lecture	Black Board
UNIT -4 MEMORY MANAGEMENT				
4.1	Background	3	Chalk & Talk	Black Board
4.2	Swapping, Contiguous Memory Allocations	3	Chalk & Talk	LCD
4.3	Paging	3	Lecture	PPT & White board
4.4	Segmentation	3	Lecture	Smart Board
4.5	Segmentation with paging	3	Lecture	Black Board
4.6	Background – demand paging	3	Discussion	Google classroom
4.7	Page replacement algorithms	3	Lecture	Black Board
4.8	Allocation of frames	3	Lecture	Black Board

4.9	Thrashing	3	Lecture	Black Board
UNIT -5 FILESYSTEM CONCEPTS				
5.1	File concept	3	Chalk & Talk	Black Board
5.2	Access methods	3	Chalk & Talk	LCD
5.3	Directory structures	3	Lecture	PPT & White board
5.4	Protection	3	Lecture	Smart Board
5.5	File system structure	3	Lecture	Black Board
5.6	Allocation methods	3	Discussion	Google classroom

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks

C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Outline the structure of OS, basic architectural components	**K1**	**PSO1& PSO2**
CO 2	Analyze on the different scheduling algorithms and critical section problems	**K1, K2 & K3**	**PSO1, PSO2, PSO3**
CO 3	Critique device and resource management techniques by concentrating on deadlocks	**K1, K2 & K3**	**PSO5, PSO6**
CO 4	Identify and know about memory management techniques	**K1, K2, K3 & K4**	**PSO3, PSO5, PSO6**
CO 5	Interpret the mechanisms adopted for file sharing in distributed Applications	**K2, K3 & K4**	**PSO4, PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	**3**	**3**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
CO2	**3**	**3**	**3**	**1**	**2**	**1**	**2**	**2**	**2**	**1**
CO3	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**1**	**1**
CO4	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**1**

CO5	**2**	**2**	**1**	**3**	**3**	**3**	**2**	**2**	**1**	**2**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

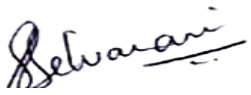
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Ms. A. Punitha Rosline**

Forwarded By



(S.Selvarani)

10%

II B.C.A

SEMESTER – III NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J3CC5	OPERATING SYSTEMS	LECTURE	6	4

COURSE DESCRIPTION

To Study about the concepts, structure and mechanisms of operating systems. To examine the operations of processes and threads, scheduling, deadlock, memory management and file systems.

COURSE OBJECTIVES

6. To have in–depth knowledge about the functionalities of the operating systems.
7. To learn the mechanisms of OS to handle processes and threads and their communication.
8. To learn the mechanisms involved in memory management
9. To gain knowledge on distributed operating system concepts
10.

UNIT I: PROCESSES (18 HRS)

Introduction: Definition, Main frame System, Multiprocessor System, Distributed systems – Process: Process concept, Process scheduling.

UNIT II: CPU SCHEDULING, PROCESS SYNCHRONIZATION (18 HRS)

CPU Scheduling: Basic concepts – scheduling criteria – Scheduling algorithms – Process Synchronization: Background – the critical section problem, Semaphores – Usage, Monitors.

UNIT III: DEADLOCK (18 HRS)

Deadlock and Starvation – Binary Semaphore – System model – deadlock characterization – methods for handling deadlocks – deadlock prevention – deadlock avoidance – deadlock deduction – recovery from deadlock- Bankers

Algorithm

UNIT IV: MEMORY MANAGEMENT (18 HRS)

Background – Swapping, Contiguous Memory Allocations, Paging, Segmentation, Segmentation with paging. Background – demand paging – Page Replacement Algorithms – allocation of frames – thrashing

UNIT V: FILESYSTEM CONCEPTS (18 HRS)

File concept – access methods – directory structures – protection – File system structure – allocation methods- RISC – CISC.

UNIT VI: DYNAMISM

Distributed shared memory (DSM) –Kernel Programming – Memory Partitioning – Linux Basic Commands – Problems in Job Scheduling Algorithms

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5. Deitel H.M, Operating System, 7th Edition, Pearson Education, 1996
6. Silberscahatz Galvin Gagne, Operating System Concept, VI Edition, John Wiley's Sons, 2010.
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OER REFERENCES :

1. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=7
2. https://greenteapress.com/thinkos/index.html

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT 1: PROCESSES				
1.1	Definition	3	Chalk & Talk	Black Board
1.2	Main frame System	3	Chalk & Talk	LCD
1.3	Multiprocessor System	3	Lecture	PPT & White board
1.4	Distributed systems – Process	3	Lecture	Smart Board
1.5	Process concept	3	Lecture	Black Board
1.6	Process scheduling	3	Discussion	Google classroom
UNIT 2: CPU SCHEDULING, PROCESS SYNCHRONIZATION				
2.1	Basic concepts – scheduling criteria	3	Chalk & Talk	Black Board
2.2	Scheduling algorithms – Process Synchronization	3	Chalk & Talk	LCD
2.3	Background	3	Lecture	PPT & White board
2.4	The critical section problem	3	Lecture	Smart Board
2.5	Semaphores	3	Lecture	Black Board
2.6	Usage, Monitors	3	Discussion	Google classroom
UNIT -3 DEADLOCK				
31	Deadlock and Starvation	2	Chalk &	Black

			Talk	Board
3.2	Binary Semaphore	2	Chalk & Talk	LCD
3.3	System model – deadlock characterization	3	Lecture	PPT & White board
3.4	methods for handling deadlocks	3	Lecture	Smart Board
3.5	Deadlock Prevention	2	Lecture	Black Board
3.6	Deadlock Avoidance	2	Lecture	Black Board
3.7	Deadlock Deduction	2	Lecture	Black Board
3.8	Recovery from Deadlock	2	Lecture	Black Board
UNIT -4 MEMORY MANAGEMENT				
4.1	Background	3	Chalk & Talk	Black Board
4.2	Swapping, Contiguous Memory Allocations	3	Chalk & Talk	LCD
4.3	Paging	3	Lecture	PPT & White board
4.4	Segmentation	3	Lecture	Smart Board
4.5	Segmentation with paging	3	Lecture	Black Board
4.6	Background – demand paging	3	Discussion	Google classroom
4.7	Page replacement algorithms	3	Lecture	Black Board
4.8	Allocation of frames	3	Lecture	Black Board

4.9	Thrashing	3	Lecture	Black Board
UNIT -5 FILESYSTEM CONCEPTS				
5.1	File concept	3	Chalk & Talk	Black Board
5.2	Access methods	3	Chalk & Talk	LCD
5.3	Directory structures	3	Lecture	PPT & White board
5.4	Protection	3	Lecture	Smart Board
5.5	File system structure	3	Lecture	Black Board
5.6	Allocation methods	3	Discussion	Google classroom

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks

C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Outline the structure of OS, basic architectural components	**K1**	**PSO1& PSO2**
CO 2	Analyze on the different scheduling algorithms and critical section problems	**K1, K2 & K3**	**PSO1, PSO2, PSO3**
CO 3	Critique device and resource management techniques by concentrating on deadlocks	**K1, K2 & K3**	**PSO5, PSO6**
CO 4	Identify and know about memory management techniques	**K1, K2, K3 & K4**	**PSO3, PSO5, PSO6**
CO 5	Interpret the mechanisms adopted for file sharing in distributed Applications	**K2, K3 & K4**	**PSO4, PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	**3**	**3**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
CO2	**3**	**3**	**3**	**1**	**2**	**1**	**2**	**2**	**2**	**1**
CO3	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**1**	**1**
CO4	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**1**

CO5	**2**	**2**	**1**	**3**	**3**	**3**	**2**	**2**	**1**	**2**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1
CO2	1	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

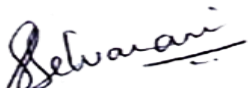
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Ms. A. Punitha Rosline**

Forwarded By



(S.Selvarani)

II B.C.A

SEMESTER – III OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
USCA	19J3CC6	LAB IN RELATIONAL DATABASE MANAGEMENT SYSTEMS	PRACTICAL	6	3

COURSE DESCRIPTION

To learn Relational Database concepts and to work with dynamic, reflective, object–oriented concepts through Query processing

COURSE OBJECTIVES

1. To give in depth practical approach to the database concepts.
2. To populate relational database and formulate SQL queries on data.

PROGRAM LIST

1. Implement Queries using DDL commands
2. Implement Queries using DML commands
3. Implement Queries using SELECT commands
4. Implement Queries using Set operations
5. Implement Queries using Joins.
6. Implement Queries using Grouping Functions.
7. Implement Queries using Sequence.
8. Implement Queries using Views and Indexes
9. Implement Cursors using PL/SQL program
10. Implement Packages and Triggers using PL/SQL program

WEB REFERENCES :

1. https://www.tutorialspoint.com/sql/sql–rdbms–concepts.htm
2. https://www.tutorialspoint.com/ruby/index.htm

OER RESOURCES :

1. https://www.oercommons.org/authoring/14614-rdbms/1/view

1. https://www.tutorialspoint.com/sql/sql–rdbms–concepts.htm
2. https://www.tutorialspoint.com/ruby/index.htm
3. https://www.javatpoint.com/ruby–tutorial

OER RESOURCES :

1. https://www.oercommons.org/authoring/14614-rdbms/1/view

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
LAB IN RELATIONAL DATABASE MANAGEMENT SYSTEMS				
1.1	DDL commands	10	Demo & Lab	LCD
1.2	DML commands	10	Chalk & Talk	PPT & White board
1.3	SELECT commands	10	Lecture	PPT & White board
1.4	Set operations	10	Demo & Lab	LCD
1.5	Joins	10	Chalk & Talk	PPT & White board
1.6	Grouping Functions	10	Lecture	PPT & White board
1.7	Sequence	5	Demo & Lab	LCD
1.8	Views and Indexes	5	Chalk & Talk	PPT & White board
1.9	Cursors, Packages and Triggers	10	Lecture	PPT & White board

CIA

Scholastic	**35**

Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

S.No	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Critique SQL commands to create	**K1**	**PSO1&**

	tables and indexes		**PSO2**
CO 2	Apply DDL and DML commands in real time applications	**K1, K2 & K3**	**PSO1, PSO2, PSO3**
CO 3	Understand the needs of triggering applications	**K2, K3 & K4**	**PSO5, PSO6**
CO 4	Disseminate knowledge of RDBMS and SQL, both in terms of design and implementation usage	**K1, K2, K3 & K4**	**PSO3, PSO5, PSO6**
CO 5	Write dynamic queries to demonstrate the concepts of RDBMS	**K2, K3 & K4**	**PSO4, PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO1 0
CO1	**3**	**3**	**1**	**2**	**2**	**1**	**1**	**2**	**1**	**1**
CO2	**3**	**3**	**3**	**2**	**1**	**1**	**2**	**2**	**1**	**2**
CO3	**2**	**2**	**1**	**2**	**3**	**3**	**2**	**2**	**1**	**2**
CO4	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**1**	**1**
CO5	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**1**	**2**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**1**	**1**	**1**	**1**
CO2	**1**	**1**	**3**	**1**	**2**
CO3	**1**	**2**	**1**	**3**	**1**
CO4	**1**	**1**	**1**	**1**	**1**
CO5	**1**	**1**	**1**	**1**	**1**

Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

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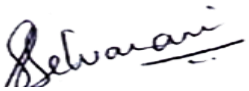


(S.Selvarani)

II B.C.A

10%

II B.C.A

SEMESTER – III NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
USCA	19J3CC6	LAB IN RELATIONAL DATABASE MANAGEMENT SYSTEMS	PRACTICAL	6	3

COURSE DESCRIPTION

To learn Relational Database concepts and to work with dynamic, reflective, object–oriented concepts through Query processing

COURSE OBJECTIVES

3. To give in depth practical approach to the database concepts.
4. To populate relational database and formulate SQL queries on data.

PROGRAM LIST

11. Implement Queries using DDL commands
12. Implement Queries using DML commands
13. Implement Queries using SELECT commands
14. Implement Queries using Set operations
15. Implement Queries using Joins.
16. Implement Queries using Grouping Functions.
17. Implement Queries using Sequence.
18. Implement Queries using Views and Indexes
19. Implement Cursors using PL/SQL program
20. Implement Packages and Triggers using PL/SQL program

21. Student Academic details

22. Employee payroll

WEB REFERENCES :

3. https://www.tutorialspoint.com/sql/sql–rdbms–concepts.htm
4. https://www.tutorialspoint.com/ruby/index.htm

OER RESOURCES :

1. https://www.oercommons.org/authoring/14614-rdbms/1/view

1. https://www.tutorialspoint.com/sql/sql–rdbms–concepts.htm
2. https://www.tutorialspoint.com/ruby/index.htm
3. https://www.javatpoint.com/ruby–tutorial

OER RESOURCES :

1. https://www.oercommons.org/authoring/14614-rdbms/1/view

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
LAB IN RELATIONAL DATABASE MANAGEMENT SYSTEMS				
1.1	DDL commands	10	Demo & Lab	LCD
1.2	DML commands	10	Chalk & Talk	PPT & White board
1.3	SELECT commands	10	Lecture	PPT & White board
1.4	Set operations	10	Demo & Lab	LCD
1.5	Joins	10	Chalk & Talk	PPT & White board
1.6	Grouping Functions	10	Lecture	PPT & White board
1.7	Sequence	5	Demo & Lab	LCD
1.8	Views and Indexes	5	Chalk & Talk	PPT & White board
1.9	Cursors, Packages and Triggers	10	Lecture	PPT & White board

CIA

Scholastic	**35**

Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

S.No	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Critique SQL commands to create	**K1**	**PSO1&**

	tables and indexes		**PSO2**
CO 2	Apply DDL and DML commands in real time applications	**K1, K2 & K3**	**PSO1, PSO2, PSO3**
CO 3	Understand the needs of triggering applications	**K2, K3 & K4**	**PSO5, PSO6**
CO 4	Disseminate knowledge of RDBMS and SQL, both in terms of design and implementation usage	**K1, K2, K3 & K4**	**PSO3, PSO5, PSO6**
CO 5	Write dynamic queries to demonstrate the concepts of RDBMS	**K2, K3 & K4**	**PSO4, PSO5, PSO6**

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO1 0
CO1	**3**	**3**	**1**	**2**	**2**	**1**	**1**	**2**	**1**	**1**
CO2	**3**	**3**	**3**	**2**	**1**	**1**	**2**	**2**	**1**	**2**
CO3	**2**	**2**	**1**	**2**	**3**	**3**	**2**	**2**	**1**	**2**
CO4	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**1**	**1**
CO5	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**1**	**2**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**1**	**1**	**1**	**1**
CO2	**1**	**1**	**3**	**1**	**2**
CO3	**1**	**2**	**1**	**3**	**1**
CO4	**1**	**1**	**1**	**1**	**1**
CO5	**1**	**1**	**1**	**1**	**1**

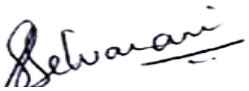
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Mrs. RAMYA R**

Forwarded By



(S.Selvarani)

II B.C.A

III B.C.A

SEMESTER – V OLD

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J5CC9	SOFTWARE ENGINEERING	LECTURE	5	5

COURSE DESCRIPTION

Aims to provide a thorough knowledge about various phases involved in software development along with the testing techniques.

COURSE OBJECTIVES

1. To impart fundamental knowledge and skills in Software Engineering.
2. To think critically, clearly identifying and using evidence, criteria, and values in decision making process.
3. To develop Software engineering skills that will enable them to create high quality of software.
4. To gain the techniques and skills on how to use modern software testing tools to support software testing projects.
5. To understand software test automation problems and solutions.

UNIT I: INTRODUCTION TO SOFTWARE ENGINEERING (12 HRS)

Definitions – Size Factors – Quality and Productivity Factors – Planning a Software Project:Planning the Development Process – Planning an Organizational Structure

UNIT II: COST ESTIMATION (12 HRS)

Software cost Factors – Software Cost Estimation Techniques – Staffing – Level Estimation – Estimating Software Estimation Costs.

UNIT III: SOFTWARE REQUIREMENTS DEFINITION (12 HRS)

The Software Requirements specification – Formal Specification Techniques – Software Design: Fundamental Design Concepts – Modules – Modularization Criteria.

UNIT IV: SOFTWARE TESTING (12 HRS)

Levels of Testing – Introduction – Proposal Testing – Requirement Testing– Design Testing– Code Review – Unit testing – Module Testing – Integration testing – Big – Bang Testing– System testing– Testing stages – Special Tests – Complexity – GUI – Compatibility – Security – Performance – Volume – Stress – Recovery – Installation– Manual Support – Adhoc Testing – Usability Testing

UNIT V: TESTING TOOLS (12 Hrs)

Software Testing tools an Overview: Need for automated Testing tools– Taxonomy of Testing tools– Functional – Regression testing tools– Performance Testing Tools– Testing Management tools– Source code testing tools– How to select a testing tool.

UNIT VI: DYNAMISM

Manual Test Cases – UML Diagrams – Developing Software using SDLC Model – Case Study for Test Cases – Testing Tools Online

REFERENCE BOOKS:

1. Software Engineering Concepts, Richard Fairley, 2012, TMH.
2. Software Engineering Project Management, 2nd Edition**,** 2006,Wiley India.
3. Software testing principles , techniques and tools, M.G. LIMAYE , Tata McGraw Hill , 2009.
4. Software Testing Tools, Dr. K. V. K. K. Prasad, Dream Tech press, Edition 2012

WEB REFERENCES:

1. https://en.wikipedia.org/wiki/Software_engineering
2. https://www.tutorialspoint.com/software_engineering/index.htm
3. https://www.softwaretestingmaterial.com/software–testing/

OER REFERENCES:

https://www.oercommons.org/courses/software-engineering

1.4	Planning an Organizational Structure	3	Lecture	Smart Board
UNIT 2: COST ESTIMATION				
2.1	Software cost Factors	3	Chalk & Talk	Black Board
2.2	Software Cost Estimation Techniques	3	Chalk & Talk	LCD
2.3	Staffing-Level Estimation	3	Lecture	PPT & White board
2.4	Estimating Software Estimation Costs	3	Lecture	Smart Board
UNIT -3 SOFTWARE REQUIREMENTS DEFINITION				
3.1	The Software Requirements specification	3	Chalk & Talk	Black Board
3.2	Formal Specification Techniques	3	Chalk & Talk	LCD
3.3	Fundamental Design Concepts-Modules	3	Lecture	PPT
3.4	Modularization Criteria	3	Lecture	PPT
UNIT -4 SOFTWARE TESTING				
4.1	Levels of Testing – Introduction	1	Chalk & Talk	Black Board
4.2	Proposal Testing – Requirement Testing- Design Testing	1	Chalk & Talk	LCD
4.3	Code Review – Unit testing – Module Testing	1	Lecture	PPT & White board
4.4	Integration testing – Big – Bang Testing	2	Lecture	Smart Board
4.5	System testing- Testing stages - Special Tests – Complexity	2	Lecture	Black Board

4.6	GUI – Compatibility – Security	2	Discussion	Google classroom
4.7	Performance –Volume –Stress – Recovery	1	Lecture	Black Board
4.8	Installation– Manual Support	1	Lecture	Black Board
4.9	Adhoc Testing – Usability Testing	1	Lecture	Black Board
UNIT -5 TESTING TOOLS				
5.1	Need for automated Testing tools	2	Chalk & Talk	Black Board
5.2	Taxonomy of Testing tools- Functional	2	Chalk & Talk	LCD
5.3	Regression testing tools	2	Lecture	PPT & White board
5.4	Performance Testing Tools- Testing Management tools	2	Lecture	Smart Board
5.5	Source code testing tools	2	Lecture	Smart Board

INTERNAL – UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %

K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Compare the various software models	K1	PSO1& PSO2
CO 2	Use knowledge, techniques, skills and modern tools necessary for software engineering practice	K1, K2, K3	PSO3

CO 3	Analyze on the design factors and guidelines	K1 & K3	PSO5
CO 4	Understand the different types of testing used in software's	K1, K2, K3	PSO3, PSO5
CO 5	Compare the various types of Testing styles	K2, K3 & K4	PSO8

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	1	1	1	2	2	1	1
CO2	2	2	3	2	2	1	1	2	1	1
CO3	2	2	2	2	3	1	1	2	2	1
CO4	2	1	3	2	3	1	2	2	1	1
CO5	2	2	1	2	2	2	2	3	1	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	1	3	1	1	1
CO2	1	1	3	1	2
CO3	1	1	3	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

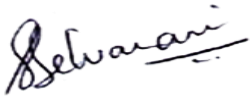
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Ms. S. Selvarani**

Forwarded By



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III B.C.A

SEMESTER – V NEW

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J5CC9	SOFTWARE ENGINEERING	LECTURE	5	5

COURSE DESCRIPTION

Aims to provide a thorough knowledge about various phases involved in software development along with the testing techniques.

COURSE OBJECTIVES

1. To impart fundamental knowledge and skills in Software Engineering.
2. To think critically, clearly identifying and using evidence, criteria, and values in decision making process.
3. To develop Software engineering skills that will enable them to create high quality of software.
4. To gain the techniques and skills on how to use modern software testing tools to support software testing projects.
5. To understand software test automation problems and solutions.

UNITS

UNIT I: INTRODUCTION TO SOFTWARE ENGINEERING (12 HRS)

Definitions – Size Factors – Quality and Productivity Factors – Planning a Software Project: Planning the Development Process – Planning an Organizational Structure

UNIT II: COST ESTIMATION (12 HRS)

Software cost Factors – Software Cost Estimation Techniques – Staffing – Level Estimation – Estimating Software Estimation Costs- Water Fall Model – Iterative Model-RAD Model- Spiral Model- Agile Model

UNIT III: SOFTWARE REQUIREMENTS DEFINITION (12 HRS)

The Software Requirements specification – Formal Specification Techniques – Software Design: Fundamental Design Concepts – Modules – Modularization Criteria.

UNIT IV: SOFTWARE TESTING (12 HRS)

Levels of Testing – Introduction – Proposal Testing – Requirement Testing– Design Testing– Code Review – Unit testing – Module Testing – Integration testing – Big – Bang Testing– System testing– Testing stages – Special Tests – Complexity – GUI – Compatibility – Security – Performance – Volume – Stress – Recovery – Installation– Manual Support – Adhoc Testing – Usability Testing

UNIT V: TESTING TOOLS (12 Hrs)

Software Testing tools an Overview: Need for automated Testing tools– Taxonomy of Testing tools– Functional – Regression testing tools– Performance Testing Tools– Testing Management tools– Source code testing tools– How to select a testing tool.

UNIT VI: DYNAMISM

Manual Test Cases – UML Diagrams – Developing Software using SDLC Model – Case Study for Test Cases – Testing Tools Online

REFERENCE BOOKS:

5. Software Engineering Concepts, Richard Fairley, 2012, TMH.
6. Software Engineering Project Management, 2nd Edition**,** 2006,Wiley India.
7. Software testing Principles , techniques and tools, M.G. LIMAYE , Tata McGraw Hill , 2009.
8. Software Testing Tools, Dr. K. V. K. K. Prasad, Dream Tech press, Edition 2012

WEB REFERENCES:

4. https://en.wikipedia.org/wiki/Software_engineering
5. https://www.tutorialspoint.com/software_engineering/index.htm
6. https://www.softwaretestingmaterial.com/software–testing/

OER REFERENCES:

https://www.oercommons.org/courses/software-engineering

1.4	Planning an Organizational Structure	3	Lecture	Smart Board
UNIT 2: COST ESTIMATION				
2.1	Software cost Factors	3	Chalk & Talk	Black Board
2.2	Software Cost Estimation Techniques	3	Chalk & Talk	LCD
2.3	Staffing-Level Estimation	3	Lecture	PPT & White board
2.4	Estimating Software Estimation Costs	3	Lecture	Smart Board
UNIT -3 SOFTWARE REQUIREMENTS DEFINITION				
3.1	The Software Requirements specification	3	Chalk & Talk	Black Board
3.2	Formal Specification Techniques	3	Chalk & Talk	LCD
3.3	Fundamental Design Concepts-Modules	3	Lecture	PPT
3.4	Modularization Criteria	3	Lecture	PPT
UNIT -4 SOFTWARE TESTING				
4.1	Levels of Testing – Introduction	1	Chalk & Talk	Black Board
4.2	Proposal Testing – Requirement Testing- Design Testing	1	Chalk & Talk	LCD
4.3	Code Review – Unit testing – Module Testing	1	Lecture	PPT & White board
4.4	Integration testing – Big – Bang Testing	2	Lecture	Smart Board
4.5	System testing- Testing stages - Special Tests – Complexity	2	Lecture	Black Board

4.6	GUI – Compatibility – Security	2	Discussion	Google classroom
4.7	Performance –Volume –Stress – Recovery	1	Lecture	Black Board
4.8	Installation– Manual Support	1	Lecture	Black Board
4.9	Adhoc Testing – Usability Testing	1	Lecture	Black Board
UNIT -5 TESTING TOOLS				
5.1	Need for automated Testing tools	2	Chalk & Talk	Black Board
5.2	Taxonomy of Testing tools- Functional	2	Chalk & Talk	LCD
5.3	Regression testing tools	2	Lecture	PPT & White board
5.4	Performance Testing Tools- Testing Management tools	2	Lecture	Smart Board
5.5	Source code testing tools	2	Lecture	Smart Board

INTERNAL – UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %

K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Compare the various software models	K1	PSO1& PSO2
CO 2	Use knowledge, techniques, skills and modern tools necessary for software engineering practice	K1, K2, K3	PSO3

CO 3	Analyze on the design factors and guidelines	K1 & K3	PSO5
CO 4	Understand the different types of testing used in software's	K1, K2, K3	PSO3, PSO5
CO 5	Compare the various types of Testing styles	K2, K3 & K4	PSO8

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	1	1	1	2	2	1	1
CO2	2	2	3	2	2	1	1	2	1	1
CO3	2	2	2	2	3	1	1	2	2	1
CO4	2	1	3	2	3	1	2	2	1	1
CO5	2	2	1	2	2	2	2	3	1	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	1	3	1	1	1
CO2	1	1	3	1	2
CO3	1	1	3	3	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1

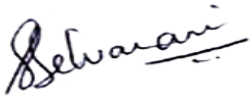
Note:

- Strongly Correlated – **3**
- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Ms. S. Selvarani**

Forwarded By



III B.C.A

SEMESTER – V OLD

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J5ME1	CLOUD COMPUTING	LECTURE	5	5

COURSE DESCRIPTION

To learn the basic knowledge of structured programming in C control structures, data structures and functions along with basic problem solving techniques.

COURSE OBJECTIVES

1. To gain in – depth knowledge in cloud computing terminologies
2. To acquire key concepts of virtualization.
3. To formulate various cloud strategies
4. To assess benchmark tools and techniques

UNIT I: CLOUD MODELS(15 HRS)

Introduction: Essential, Benefits, Business and IT perspective, Cloud and virtualization, Cloud services requirements, Cloud and Dynamic Infrastructure, Cloud Computing Characteristics, Cloud Adoption. Cloud Models – Introduction, Cloud Characteristics, cloud Models, Security in a public cloud, Public versus private clouds.

UNIT II: CLOUD SERVICES(15 HRS)

Introduction: Cloud as a Service –Gamut of Cloud Solutions, Principal Technologies, Cloud Strategy, Cloud design and implementation using SOA, Conceptual cloud model. Cloud Solutions – Introduction, Cloud Ecosystem, Cloud Business process Management.

UNIT III: CLOUD SECURITY MANAGEMENT (15 HRS)

Introduction: Cloud Offerings:–Information Storage, Retrieval, Archive and

Protection – Cloud Analytics – Testing Under Cloud –Information Security – Storage Cloud. Cloud Management – Introduction, Resiliency, Provisioning, Asset Management, Cloud Governance, High Availability and Disaster Recovery.

UNIT IV: CLOUD VIRTUALIZATION (15 HRS)

Introduction: Cloud Virtualization Technology – Virtualization Defined, Virtualization Benefits, Server Virtualization, Virtualization for x86 Architecture, Hypervisor Management Software, VIO Server, Virtual Infrastructure Requirements.Deep Dive: Cloud Virtualization – Introduction, Storage Virtualization, Storage Area Networks, Network – Attached Storage, Cloud server Virtualization.

UNIT V: BENCHMARK TOOLS (15 HRS)

Cloud Infrastructure – Introduction, OLTP Benchmark, Business Intelligences Benchmark, E – Business Benchmark, ISV Benchmarks, Cloud performance Data Collection and performance Monitoring Commands, Benchmark Tools.

UNIT VI: DYNAMISM (HRS.)

First movers in the cloud – Google Big Table Data Store – Cloud services for individuals – Using smart phones with the cloud.–what are APIshow. APIs work – API creators – Web Browsers – Service Level Agreements (SLA).

REFERENCE BOOKS:

1. John Rhoton, Cloud Computing Explained – Implementation Handbook for Enterprises, Amazon.com
2. David S. Linthicum, Cloud Computing and SOA Convergence in Your Enterprise – A Step – by – Step Guide
3. Dr Kumar Saurabh, Cloud Computing Insights into New Era Infrastructure, An Emm International,2014, III Edition

WEB REFERENCES:

1. https://en.wikipedia.org/wiki/Cloud_computing
2. https://searchcloudcomputing.techtarget.com/definition/cloud–computing

OER REFERENCE:

https://onlinecourses.nptel.ac.in/noc21_cs14/preview

1.2	cloud and virtualization, cloud services requirements	3	Chalk & Talk	LCD
1.3	Cloud and dynamic infrastructure, cloud computing characteristics	2	Lecture	PPT & White board
1.4	Introduction,cloud characteristics	2	Lecture	Smart Board
1.5	Cloud models, security in a public cloud	3	Lecture	Smart Board
1.6	Public versus private clouds	3	Lecture	Smart Board
UNIT 2: CLOUD SERVICES				
2.1	Cloud as a Service –Gamut of Cloud Solutions	2	Chalk & Talk	Black Board
2.2	Principal Technologies, Cloud Strategy	2	Chalk & Talk	LCD
2.3	Cloud design & implementation using SOA, Conceptual model	3	Lecture	PPT
2.4	Introduction, Cloud Ecosystem	2	Lecture	Smart Board
2.5	Cloud Business process Management	2	Lecture	Smart Board
2.6	Cloud service management	2	Lecture	Smart Board
2.7	Cloud stack	2		
UNIT -3 CLOUD SECURITY MANAGEMENT				
3.1	Cloud Offerings:–Information Storage, Retrieval, Archive and Protection	2	Chalk & Talk	Black Board
3.2	Cloud Analytics – Testing Under Cloud	2	Chalk & Talk	LCD
3.3	Information Security – Storage Cloud	3	Lecture	PPT & White

				board
3.4	Cloud Management – Introduction	3	Lecture	Smart Board
3.5	Resiliency, Provisioning	2	Chalk & Talk	Black Board
3.6	Asset Management, Cloud Governance	2	Lecture	Smart Board
3.7	High Availability and Disaster Recovery	1	Chalk & Talk	LCD
UNIT -4 CLOUD VIRTUALIZATION				
4.1	Cloud Virtualization Technology – Virtualization Defined	1	Chalk & Talk	Black Board
4.2	Virtualization Benefits, Server Virtualization	2	Chalk & Talk	LCD
4.3	Virtualization for x86 Architecture	2	Lecture	PPT & White board
4.4	Hypervisor Management Software, VIO Server	2	Lecture	Smart Board
4.5	Virtual Infrastructure Requirements	2	Lecture	Black Board
4.6	Cloud Virtualization – Introduction, Storage Virtualization	2	Discussion	Google classroom
4.7	Storage Area Networks	2	Lecture	Black Board
4.8	Network – Attached Storage	1	Lecture	Black Board
4.9	Cloud server Virtualization	1	Lecture	Black Board
UNIT -5 BENCHMARK TOOLS				
5.1	Cloud Infrastructure – Introduction	2	Chalk & Talk	Black Board

5.2	OLTP Benchmark, Business Intelligences Benchmark	3	Chalk & Talk	LCD
5.3	E – Business Benchmark, ISV Benchmarks	3	Lecture	PPT & White board
5.4	Cloud performance Data Collection	3	Lecture	Smart Board
5.5	performance Monitoring Commands	2	Lecture	Smart Board
5.6	Benchmark Tools.	2	Lecture	Smart Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %

Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**

10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Outline problems and evaluate various cloud computing solutions	K1	PSO1, PSO2
CO 2	Outline Cloud service and deployment models	K1 & K2	PSO1, PSO2,PSO3

CO 3	Identify the architecture and infrastructure of cloud computing including SaaS,PaaS, IaaS, public cloud, private cloud, hybrid cloud and community cloud	K1 & K2	PSO3, PSO4
CO 4	Predict security issues and formulate recovery mechanisms	K1, K2, K3 & K4	PSO4, PSO5
CO 5	Understand the concept of virtualization	K2, K3 & K4	PSO5, PSO6

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	2	1	1	2	2	1	1
CO2	3	3	3	2	1	2	1	2	1	1
CO3	2	1	3	3	2	1	2	2	2	1
CO4	2	1	2	3	3	1	2	2	2	2
CO5	2	2	2	3	3	1	2	2	1	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	3	1
CO2	3	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	3	1	3	1

Note:

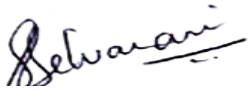
- Strongly Correlated – **3**

- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Ms. S. Selvarani**

Forwarded By



(S.Selvarani)

III B.C.A

10%

SEMESTER – V NEW

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS	CREDITS
USCA	19J5ME1	CLOUD COMPUTING	LECTURE	5	5

COURSE DESCRIPTION

To learn the basic knowledge of structured programming in C control structures, data structures and functions along with basic problem solving techniques.

COURSE OBJECTIVES

5. To gain in – depth knowledge in cloud computing terminologies
6. To acquire key concepts of virtualization.
7. To formulate various cloud strategies
8. To assess benchmark tools and techniques

UNIT I: CLOUD MODELS (15 HRS)

Introduction: Essential, Benefits, Business and IT perspective, Cloud and virtualization, Cloud services requirements, Cloud and Dynamic Infrastructure, Cloud Computing Characteristics, Cloud Adoption. Cloud Models – Introduction, Cloud Characteristics, cloud Models, Security in a public cloud, Public versus private clouds.

UNIT II: CLOUD SERVICES (15 HRS)

Introduction: Cloud as a Service –Gamut of Cloud Solutions, Principal Technologies, Cloud Strategy, Cloud design and implementation using SOA, Conceptual cloud model. Cloud Solutions – Introduction, Cloud Ecosystem, Cloud Business process Management, Cloud service management, Cloud stack.

UNIT III: CLOUD SECURITY MANAGEMENT (15 HRS)

Introduction: Cloud Offerings:–Information Storage, Retrieval, Archive and Protection – Cloud Analytics – Testing Under Cloud –Information Security – Storage Cloud. Cloud Management – Introduction, Resiliency, Provisioning,

Asset Management, Cloud Governance, High Availability and Disaster Recovery.

UNIT IV: CLOUD VIRTUALIZATION (15 HRS)

Introduction: Cloud Virtualization Technology – Virtualization Defined, Virtualization Benefits, Server Virtualization, Virtualization for x86 Architecture, Hypervisor Management Software, VIO Server, Virtual Infrastructure Requirements. Deep Dive: Cloud Virtualization – Introduction, Storage Virtualization, Storage Area Networks, Network – Attached Storage, Cloud server Virtualization.

UNIT V: BENCHMARK TOOLS (15 HRS)

Cloud Infrastructure – Introduction, OLTP Benchmark, Business Intelligences Benchmark, E – Business Benchmark, ISV Benchmarks, Cloud performance Data Collection and performance Monitoring Commands, Benchmark Tools.

UNIT VI: DYNAMISM (15 HRS.)

First movers in the cloud – Google Big Table Data Store – Cloud services for individuals – Using smart phones with the cloud.–what are APIshow. APIs work – API creators – Web Browsers – Service Level Agreements (SLA).

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3. https://en.wikipedia.org/wiki/Cloud_computing
4. https://searchcloudcomputing.techtarget.com/definition/cloud–computing

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1.2	cloud and virtualization, cloud services requirements	3	Chalk & Talk	LCD
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1.5	Cloud models, security in a public cloud	3	Lecture	Smart Board
1.6	Public versus private clouds	3	Lecture	Smart Board
UNIT 2: CLOUD SERVICES				
2.1	Cloud as a Service –Gamut of Cloud Solutions	2	Chalk & Talk	Black Board
2.2	Principal Technologies, Cloud Strategy	2	Chalk & Talk	LCD
2.3	Cloud design & implementation using SOA, Conceptual model	3	Lecture	PPT
2.4	Introduction, Cloud Ecosystem	2	Lecture	Smart Board
2.5	Cloud Business process Management	2	Lecture	Smart Board
2.6	Cloud service management	2	Lecture	Smart Board
2.7	Cloud stack	2		
UNIT -3 CLOUD SECURITY MANAGEMENT				
3.1	Cloud Offerings:–Information Storage, Retrieval, Archive and Protection	2	Chalk & Talk	Black Board
3.2	Cloud Analytics – Testing Under Cloud	2	Chalk & Talk	LCD
3.3	Information Security – Storage Cloud	3	Lecture	PPT & White

				board
3.4	Cloud Management – Introduction	3	Lecture	Smart Board
3.5	Resiliency, Provisioning	2	Chalk & Talk	Black Board
3.6	Asset Management, Cloud Governance	2	Lecture	Smart Board
3.7	High Availability and Disaster Recovery	1	Chalk & Talk	LCD
UNIT -4 CLOUD VIRTUALIZATION				
4.1	Cloud Virtualization Technology – Virtualization Defined	1	Chalk & Talk	Black Board
4.2	Virtualization Benefits, Server Virtualization	2	Chalk & Talk	LCD
4.3	Virtualization for x86 Architecture	2	Lecture	PPT & White board
4.4	Hypervisor Management Software, VIO Server	2	Lecture	Smart Board
4.5	Virtual Infrastructure Requirements	2	Lecture	Black Board
4.6	Cloud Virtualization – Introduction, Storage Virtualization	2	Discussion	Google classroom
4.7	Storage Area Networks	2	Lecture	Black Board
4.8	Network – Attached Storage	1	Lecture	Black Board
4.9	Cloud server Virtualization	1	Lecture	Black Board
UNIT -5 BENCHMARK TOOLS				
5.1	Cloud Infrastructure – Introduction	2	Chalk & Talk	Black Board

5.2	OLTP Benchmark, Business Intelligences Benchmark	3	Chalk & Talk	LCD
5.3	E – Business Benchmark, ISV Benchmarks	3	Lecture	PPT & White board
5.4	Cloud performance Data Collection	3	Lecture	Smart Board
5.5	performance Monitoring Commands	2	Lecture	Smart Board
5.6	Benchmark Tools.	2	Lecture	Smart Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %

Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

END SEMESTER - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**

10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Outline problems and evaluate various cloud computing solutions	K1	PSO1, PSO2
CO 2	Outline Cloud service and deployment models	K1 & K2	PSO1, PSO2,PSO3

CO 3	Identify the architecture and infrastructure of cloud computing including SaaS,PaaS, IaaS, public cloud, private cloud, hybrid cloud and community cloud	K1 & K2	PSO3, PSO4
CO 4	Predict security issues and formulate recovery mechanisms	K1, K2, K3 & K4	PSO4, PSO5
CO 5	Understand the concept of virtualization	K2, K3 & K4	PSO5, PSO6

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO10
CO1	3	3	1	2	1	1	2	2	1	1
CO2	3	3	3	2	1	2	1	2	1	1
CO3	2	1	3	3	2	1	2	2	2	1
CO4	2	1	2	3	3	1	2	2	2	2
CO5	2	2	2	3	3	1	2	2	1	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	3	1
CO2	3	1	3	1	2
CO3	1	2	1	3	1
CO4	1	1	1	1	1
CO5	1	3	1	3	1

Note:

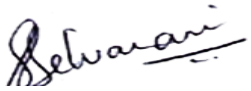
- Strongly Correlated – **3**

- Moderately Correlated – **2**
- Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name : Ms. S. Selvarani**

Forwarded By



(S.Selvarani)