Nallamuthu Gounder Mahalingam College (Autonomous)

Re-Accredited by NAAC & ISO 9001:2015 Certified Institution

Pollachi-642001

Department of BCA

SYLLABUS

(Effective for 2022 – 2025 Batch and onwards)

U.G.DEPARTMENT OF COMPUTER APPLICATIONS

Syllabus

BATCH: 2022 – 2025

Faculty Members

Dr. Dr.K.Haridas, , M.C.A., M. Phil., Ph.D.,
Dr.S.Hemalatha, M.C.A., M. Phil., Ph.D.,
Ms.D.Umamaheswari, M.C.A., M. Phil., (Ph.D).,
Dr.R.Malathi Ravindran, M.C.A., M. Phil., Ph.D.,
Dr.B.AlaguSundari, M.C.A., M. Phil., Ph.D.,
Dr.S.Niraimathi, M.C.A., M. Phil., Ph.D.,
Mr.S.Dilip Kumar, M.C.A., M. Phil., (Ph.D).,
Ms.N.Divya, M.C.A., M. Phil., (Ph.D).,
Mr.D.Poobathy, M.C.A., M. Phil., (Ph.D).,
Mr.A.Muruganandham, M.Sc., M. Phil., (Ph.D).,

Nallamuthu Gounder Mahalingam College

An Autonomous Institution affiliated to Bharathiar University

Re-Accredited by NAAC and ISO 9001:2015 Certified Institution

Pollachi – 642 001

NGM College

Vision

Our dream is to make the college an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

UG DEPARTMENT OF COMPUTER APPLICATIONS

Vision

The Department of Computer Applications (U.G) is dedicated to sustain excellence in teaching, to compete global markets for computer professionals, to structures the students to articulate, principled, innovative and confident which leads to be good leaders and decision makers with passion.

Mission

Increasing the dimensionality of education through the effective use of Information Technology. Provide comprehensive environment to improve the individual proficiency.

- Persuade the students to explore, to create, to challenge and to lead.
- Inclusive of industry and life oriented subjects based on the current scenario.

Program Educational Objectives:

PEO1	To develop skilled manpower in the various areas of information technology like Data Base Management, Software Development, Computer-Languages, Software Engineering and Web Based Applications etc.
PEO2	To prepare our graduate to start the career as an Application Developer , Network Administrator , Software Tester, Software Engineer, Junior Programmer, Web Developer.
PEO3	To pursue higher studies such as MCA, M.Sc. Computer Science, M.Sc. Data Science, MBA.
PEO4	To impart high professionalism among the students by providing technical and soft skills with ethical standards.
PEO5	To encourage students for research activities and entrepreneurial skills by inculcating interactive quality teaching and organizing symposiums, conferences, seminars, workshops and technical discussions.

Program Outcomes:

PO1	**Disciplinary Knowledge -** Demonstrate the aptitude of Computer Programming and Computer based problem solving skills.
PO2	**Critical Thinking -** Display the knowledge of appropriate theory, practices and tools for the specification, design, implementation
PO3	**Problem Solving** - Ability to link knowledge of Computer Science with other two chosen auxiliary disciplines of study.
PO4	**Information / Digital Literacy** - Display ethical code of conduct in usage of Internet and Cyber systems.
PO5	**Lifelong Learning -** Ability to pursue higher studies of specialization and to take up technical employment.
PO6	**Analytical Reasoning -** Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
PO7	**Scientific Reasoning -** Ability to operate, manages, deploy, configure computer network, hardware, software operation of an organization.
PO8	**Reflective Thinking -** Ability to present result using different presentation tools.
PO9	**Multicultural Competence -** Ability to appreciate emerging technologies and tools.

PO10	**Co-operation / Teamwork -** The ability to work independently on a substantial software project and as an effective team member.

Program Specific Outcomes:

PSO - 01	Explore technical knowledge in diverse areas of Computer Science and experience an environment conducive in cultivating skills for successful career, entrepreneurship and higher studies.
PSO - 02	Expertise to face the challenges of changing trends and career opportunities as per local and global industry needs.

Mapping

PEOs / POs \ PSOs	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	H	H	H	H	H
PO2	H	H	H	H	H
PO3	M	M	H	M	M
PO4	M	M	H	H	H
PO5	M	H	M	M	M
PO6	H	H	H	H	H
PO7	M	M	H	H	H
PO8	H	H	H	H	H
PO9	H	H	M	M	M
P10	H	H	H	H	H
PSO1	H	M	H	H	H
PSO2	H	H	H	H	M

N.G.M College – UG Department of Computer Applications
Scheme of Examination for 2022 - 2025
Choice Based Credit System & OBES

SEMESTER - I

Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	22UTL101 / 22UHN101 / 22UFR101	Tamil Paper - I /	6	-		3	50	50	100	3
		Hindi Paper - I /	6	-	-					
		French Paper - I	6	-	-					
II	22UEN101	Communication Skills-I(Level I)	5	-	-	3	50	50	100	3
	22UEN102	Communication Skills-I(Level II)	5	-	-					
III	22UBC101	**Core - I** : Programming In C	5		5	3	50	50	100	4
	22UBC102	**Core – II** : Data Structures	4		5	3	50	50	100	4
	22UBC1A1	**Allied - I** : Mathematics I -Computer Oriented Numerical And Statistical Methods	4		5	3	50	50	100	4
	22UBC103	Core Lab -I : Programming In C		4		3	25	25	50	2
IV	22UHR101	Human Rights	1	-	-	2	-	50	50	2
	22HEC101	Human Excellence - Personal Values & SKYYoga Practice - I	1	-	-	2	25	25	50	1
V		Extension Activities –Annexure I	-	-	-	-	-	-	-	-
CC	22CFE101	Fluency in English-I	-	-	-	-	-	-	-	-
		Online Course (Optional) (MOOC / NPTEL / SWAYAM)								Grade
Total									**650**	**23**

SEMESTER - II										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	22UTL202 / 22UHN202/ 22UFR202	Tamil Paper - II /	5	-	-	3	50	50	100	3
		Hindi Paper - II /	5	-	-					
		French Paper - II	5	-	-					
II	22UEN202	Communication Skills-II (Level I)	6	-	-	3	50	50	100	3
	22UEN203	Communication Skills-II (Level II)	6	-	-					
III	22UBC204	**Core - III** : Object Oriented Programming With C++	4		5	3	50	50	100	4
	22UBC205	**Core - IV** : Digital ComputerFundamentals	4		-	3	50	50	100	4
	22UBC2A2	**Allied - II** : Mathematics II –Mathematical Foundations Of Computer Applications	4		5	3	50	50	100	4
	22UBC206	**Core Lab - II** : ProgrammingIn C++		4		3	25	25	50	2
IV	22EVS201	Environmental Studies	2	-	-	2	-	50	50	2
	22HEC202	Human Excellence - Family Values & SKY Yoga Practice - II	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	22CFE202	Fluency in English - II	-	-	-	-	-	-	-	-
	22CMM201	Manaiyiyal Mahathuvam - I	1*	-	-	2	-	50	50	Grade
	22CUB201	Uzhavu Bharatham - I	1*	-	-	2	-	50	50	Grade
		Online Course (Optional) (MOOC/ NPTEL /SWAYAM)								Grade
Total									**650**	**23**

SEMESTER - III										
Part	**Subject Code**	**Title of the Paper**	**Hrs. / Week**		**Hrs. / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	22UTL3C3	Tamil Paper-III	3	-	-	3	25	75	100	3
	22UHN3C3	Hindi Paper-III								
	22UFR3C3	French Paper-III								
II	22UEN3C3	Communication Skills – III	3	-	-	3	25	75	100	3
III	22UBC307	**Core V :**Relational Database management System and Oracle	4			3	25	75	100	4
	22UBC308	**Core VI:** Operating System & Linux	4			3	25	75	100	4
	22UBC3A3	**Allied III:** Accountancy For Decision Making	4			3	25	75	100	4
	22UBC309	**Core Lab - III:** Relational Database Management System and Oracle		5		3	20	30	50	2
	22UBC310	**Core Lab- IV:** Programming in Linux		5		3	20	30	50	2
IV	22UBC3N1 / 22UBC3N2	Non Major Elective-I: Web Designing Lab Non Major Elective - I : Desktop Publishing Lab	-	1	-	2	-	50	50	2
	22HEC303	Human Excellence - Professional Values & Ethics - SKY Yoga Practice - III	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
EC	22CMM302	Manaiyiyal Mahathuvam - II			15 Hrs.	2	-	50	50	Grade
	22CUB302	Uzhavu Bharatham - II			15 Hrs.	2	-	50	50	Grade
	22UBC3VA	**VAC I:** PC Assembly & Troubleshooting			30 Hrs.					2*
					45 Hrs.					3*
Total			**30**						**700**	**25**

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course

CORE – Core Course; GE – Generic Elective; VAC-Department Specific Value Added Course; *Extra Credits;

SEMESTER - IV										
Part	**Subject Code**	**Title of the Paper**	**Hrs. / Week**		**Hrs. / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	22UTL4C4	Tamil Paper-IV	3	-	-	3	25	75	100	3
	22UHN4C4	Hindi Paper-IV								
	22UFR4C4	French Paper-IV								
II	22UEN4C4	Communication Skills – IV	3	-	-	3	25	75	100	3
III	22UBC411	**Core VII:** Visual Programming	4			3	25	75	100	3
	22UBC412	**Core VIII:** Java Programming	4			3	25	75	100	3
	22UBC4A4	**Allied IV:** Mathematics III-Computer Based Optimization Techniques	4			3	25	75	100	3
	22UBC413	**Core Lab V:**Visual Programming		4		3	20	30	50	2
	22UBC414	**Core Lab VI:** Java Programming		4		3	20	30	50	2
	22UBC4S1/ 22UBC4S2	**SEC II**: Naan Mudhalvan: Cloud Computing / DevOps Foundation		2		2	20	30	50	2
IV	22UBC4N1 / 22UBC4N2	Non Major Elective-II:Photo Effects Lab/ Non Major Elective–II: Animation Lab	1	-	-	2	-	50	50	2
	22HEC404	Human Excellence - Social Values & SKY Yoga Practice - IV	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	50	1
EC	22CMM403	Manaiyiyal Mahathuvam - III			15 Hrs.	2	-	50	50	Grade
	22CUB403	Uzhavu Bharatham - III			15 Hrs.	2	-	50	50	Grade
	22UBC4VA	**VAC II:** PC Assembly & Maintenance			30 Hrs.					2*
					45 Hrs.					3*
Total			**30**						**750**	**25**

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course
CORE – Core Course; GE – Generic Elective; SEC – Skill Enhancement Course; VAC-Department Specific Value Added Course;

SEMESTER - V										
Part	**Subject Code**	**Title of the Paper**	**Hrs. / Week**		**Hrs. / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
III	22UBC515	**Core IX:** Python Programming	5			3	25	75	100	5
	22UBC516	**Core X:** Software Testing	5			3	25	75	100	5
	22UBC5E1 / 22UBC5E2 / 22UBC5E3	**Core Elective-I**	6			3	25	75	100	5
	22UBC517	**Core Lab VII :**Python Programming		5		3	20	30	50	2
	22UBC518	**Core Lab VIII :**Software Testing		5		3	20	30	50	2
	22UBC519	**Project:** Mini Project					50	50	100	2
	22UBC5S1 / 22UBC5S2	**SEC III**: Mobile Phone Services / Internet Of Things	3			2	-	50	50	2
IV	22HEC505	Human Excellence - National Values & SKY Yoga Practice - V	1	-	-	2	20	30	50	1
EC	22CSD501	Soft Skills Development - I								Grade
	22GKL501	General Awareness - Self Study	SS		-	2	-	50	50	Grade
	22UBC5AL	**ALC - I**: Adhoc and Sensor Networks- Self Study	SS					100	100	2*
Total			**30**						**600**	**24**

Core Elective-I
22UBC5E1 – Networks/
22UBC5E2 – Organizational Behaviour/
22UBC5E3-Data Science

Skill Enhancement Course - III
22UBC5S1–Mobile Phone Services/
22UBC5S2 - Internet Of Things

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course
CORE – Core Course; DSE – Discipline-Specific Elective; SEC – Skill Enhancement Course
ALC-Advanced Learner Course (Optional)
*Extra Credits;**Credits – Based on course content maximum of 4 credits

SEMESTER - VI										
Part	**Subject Code**	**Title of the Paper**	**Hrs. / Week**		**Hrs. / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
III	22UBC620	**Core XI:** PHP Programming	5			3	25	75	100	3
	22UBC621	**Core XII:** Mobile Application Development	5			3	25	75	100	3
	22UBC6E4 / 22UBC6E5 / 22UBC6E6	**Core Elective-II**	6			3	25	75	100	5
	22UBC6E7/ 22UBC6E8 / 22UBC6E9	**Core Elective-III**	6			3	25	75	100	5
	22UBC622	**Core Lab IX:** Mobile Application Development		4		3	20	30	50	2
	22UBC623	**Core Lab X:** PHP Programming		5		3	20	30	50	2
IV	22HEC606	Human Excellence - Global Values & SKY Yoga Practice - VI	1	-	-	2	20	30	50	1
	22UBC6S3/ 22UBC6S4/	Skill Enhancement Course **(SEC)** IV: **Naan Mudhalvan :** Interview Readiness / A 360° Interview Preparation Course	3			2	25	25	50	2
EC	22CSD602	Soft Skills Development - II								Grade
	22UBC6AL	Advanced Learner Course **ALC - II**: Disaster Management	SS					100	100	2*
Total			**30**						**600**	**23**

Core Elective-II	**Core Elective-II**	**Skill Enhancement Course - IV**
22UBC6E4-StorageManagement 22UBC6E5 - Current Trends and Technologies 22UBC6E6-InformationSecurity	22UBC6E7-DataMining and Warehousing 22UBC6E8-Cloud Computing 22UBC6E9-Nano Computing	22UBC6S3 – Interview Readiness 22UBC6S4-A 360° Interview Preparation Course

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course
CORE – Core Course; DSE – Discipline-Specific Elective; SEC – Skill Enhancement Course
ALC-Advanced Learner Course (Optional)
*Extra Credits;**Credits – Based on course content maximum of 4 credits

List of Abbreviations:

CORE – Core Course
GE – Generic Elective
AECORE –Ability Enhancement Compulsory Course
SEC – Skill Enhancement Course
DSE – Discipline-Specific Elective
VAC –Value Added Course
ALC – Advanced Learner Course

Grand Total = 3900; Total Credits = 140

Question Paper Pattern

(Based on Bloom's Taxonomy)

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

1. Theory Examinations: 50 Marks (Part I, II, & III)

(i) Test- I & II, ESE:

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q 1 -10)	A (Q 1 – 5 MCQ) (Q 6–10 Define/Short Answer)	10 x 1 = 10	MCQ Define	**50**
K3 (Q 11-15)	B (Either or pattern)	5 x 3 = 15	Short Answers	
K4 & K5 (Q 16 – 20)	C (Either or pattern)	5 x 5 = 25	Descriptive/ Detailed	

2. Theory Examinations: 50 Marks (Part IV : NME)

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q 1 -10)	A (Q 1 – 5 MCQ) (Q 6–10 Define / Short Answer)	10 x 1 = 10	MCQ Define	**50**
K3, K4 & K5 (Q 11-15)	B (Either or pattern)	5 x 8 = 40	Short Answers	

3. Practical Examinations: 100/50 Marks

Knowledge Level	Criterion	External/Internal Marks	Total
K3	Record work & Practical	50/50	100
K4			
K5		25/25	50

Components of Continuous Assessment

THEORY

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Test 1	(50 / 3.33) = 15	15+15+10+05+05	50
Test 2 / Model	(50 / 3.33) = 15		
Assignment / Digital Assignment	10		
Seminar / Socratic Seminar	05		
Group Task : GD, Role Play, APS	05		

Maximum Marks: 50; CIA Mark: 25

Components		Calculation	CIA Total
Test / Model	10	10+5+5+5	25
Assignment / Digital Assignment	5		
Seminar / Socratic Seminar	5		
Group Task : GD, Role Play, APS	5		

PRACTICAL

Maximum Marks: 50; CIA Mark: 25

Components		Calculation	CIA Total
Test / Model	15	15+5+5	25
Observation Note	5		
Record	5		

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Test / Model	30	30+5+15	50
Observation Note	5		
Record	15		

Maximum Marks: 200; CIA Mark: 100

Components		Calculation	CIA Total
Test / Model	60	60+10+30	100
Observation Note	10		
Record	30		

PROJECT

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Review I	10	10+10+10+20	50
Review II	10		
Review III	10		
Report Submission	20		

Maximum Marks: 200; CIA Mark: 100

Components		Calculation	CIA Total
Review I	20	20+20+20+40	100
Review II	20		
Review III	20		
Report Submission	40		

* *Components for 'Review' may include the following:*

Originality of Idea, Relevance to Current Trend, Candidate Involvement and Presentation of Report for Commerce, Management & Social Work.

Synopsis, System Planning, Design, Coding, Input form, Output format, Preparation of Report & Submission for Computer Science cluster.

STUDENT SEMINAR EVALUATION RUBRIC

Grading Scale:

A	B	C	D
5	4	2 - 3	0 - 1

CRITERIA	A - Excellent	B - Good	C - Average	D - Inadequate
Organization of presentation	Information presented as interesting story in logical, easy to follow sequence	Information presented in logical sequence; easy to follow	Most of information presented in sequence	Hard to follow; sequence of information jumpy
Knowledge of subject & References	Demonstrated full knowledge; answered all questions with elaboration **&** Material sufficient for clear understanding **AND** exceptionally presented	At ease; answered all questions **but** failed to elaborate **&** Material sufficient for clear understanding **AND** effectively presented	At ease with information; answered most questions **&** Material sufficient for clear understanding **but** not clearly presented	Does not have grasp of information; answered only rudimentary Questions **&** Material not clearly related to topic **OR** background dominated seminar
Presentation Skills using ICT Tools	Uses graphics that explain and reinforce text and presentation	Uses graphics that explain text and presentation	Uses graphics that relate to text and presentation	Uses graphics that rarely support text and presentation
Eye Contact	Refers to slides to make points; engaged with audience	Refers to slides to make points; eye contact majority of time	Refers to slides to make points; occasional eye contact	Reads most slides; no or just occasional eye contact
Elocution – (Ability to speak English language)	Correct, precise pronunciation of all terms Voice is clear and steady; audience can hear well at all times	Incorrectly pronounces few terms Voice is clear with few fluctuations; audience can hear well most of the time	Incorrectly pronounces some terms Voice fluctuates from low to clear; difficult to hear at times	Mumbles and/or Incorrectly pronounces some terms Voice is low; difficult to hear

WRITTEN ASSIGNMENT RUBRIC

Grading Scale:

A	B	C	D	F
09 - 10	07- 08	05 - 06	03 - 04	01 - 02

CRITERION	A - Excellent	B - Good	C - Average	D - Below Average	F - Inadequate
Content & Focus	Hits on almost all content exceptionally clear	Hits on most key points and writing is interesting	Hits in basic content and writing is understandable	Hits on a portion of content and/or digressions and errors	Completely off track or did not submit
Sentence Structure & Style	* Word choice is rich and varies * Writing style is consistently strong * Students own formal language	* Word choice is clear and reasonably precise * Writing language is appropriate to topic * Words convey intended message	* Word choice is basic * Most writing language is appropriate to topic * Informal language	* Word choice is vague * Writing language is not appropriate to topic * Message is unclear	* Not adequate
Sources	Sources are cited and are used critically	Sources are cited and some are used critically	Some sources are missing	Sources are not cited	Sources are not at all cited
Neatness	Typed; Clean; Neatly bound in a report cover; illustrations provided	Legible writing, well-formed characters; Clean and neatly bound in a report cover	Legible writing, some ill-formed letters, print too small or too large; papers stapled together	Illegible writing; loose pages	Same as below standard
Timeliness	Report on time	Report one class period late	Report two class periods late	Report more than one week late	Report more than 10 days late

Continuous Internal Assessment for Project / Internship

For Commerce, Management & Social Work Programme

The Final year Commerce, Management & Social Work students should undergo a project work during (V/VI) semester

- The period of study is for 4 weeks.
- Project / Internship work has to be done in an industrial organization (or) work on any industrial

problem outside the organization is allowed.

- Students are divided into groups and each group is guided by a Mentor.
- The group should not exceed four students, also interested student can undergo individually.
- A problem is chosen, objectives are framed, and data is collected, analyzed and documented in the form of a report / Project.
- Viva – Voce is conducted at the end of this semester, by an External Examiner and concerned

  Mentor (Internal Examiner).
- Project work constitutes 100 marks, out of which 50 is Internal and 50 is External Marks.

Mark Split UP

Internal	External	Total
50	50	100

S. No	Internal Components	Marks
1	Review - I	10
2	Review - II	10
3	Review - III	10
4	Rough Draft Submission	20
Total		**50**

S. No	External Components	Marks
1	Originality of Idea	05
2	Relevance to Current Trend	05
3	Candidate Involvement	05
4	Thesis Style / Language	05
5	Presentation of Report	10
6	Viva-Voce	20
Total		**50**

Continuous Internal Assessment for Project

For Computer Science Cluster

Maximum Marks: 50 Marks

Criterion	Mode of Evaluation	Marks	Total
I	Synopsis, Company Profile, System Specification, Existing System, Proposed System OR (For Android Developments) Planning Stage	10	50
II	Supporting Diagrams like system flowchart, ER, DFD, Use case and Table Design OR UI and UX Design Application Architect and Prototyping	10	
III	Coding, Input forms, Output format, Testing OR Development, Testing	20	
IV	Preparation of Report & Submission	10	

External Assessment: 50 Marks

Mode of Evaluation	Marks	Total	Grand Total
Project Report			50
Title Relevance of the Industry/Institute	05	30	
Technology	05		
Design and development Publishing	10		
Testing, Report	10		
Viva Voce			
Project Presentation	10	20	
Q&A Performance	10		

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC101			Title	Batch:	2022 - 2025
				Core - I : Programming In C	Semester:	I
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	5		Credits:	4

Course Objective

To provide a student with a thorough grounding in the basics of a Subject and make them to learn the fundamental programming concepts and methodologies which are essential to build good C programs. To develop programming skills in order to meet the day to day IT demands.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Tell the basic terminology used in computer programming	K1
CO2	Understand and debug programs in C language.	K2
CO3	Inference programming concepts such as Arrays, Functions, Structures,	K3
CO4	Analyze the dynamics of memory by the use of pointers and Structures.	K4
CO5	Design different data structures and create/update basic data files.	K5

Mapping

PO\PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	M	M	M	H	H	H
CO2	H	H	M	H	H	H	M	H	M	M	H	H

CO3	H	H	M	H	H	H	M	M	H	H	H	H
CO4	H	H	M	H	H	H	M	M	M	M	H	H
CO5	H	H	M	H	H	H	M	M	M	M	H	H

22UBC101

Units	Content	Hrs
Unit I	Overview of C-Introduction-Importance of C-Basic Structure of C Program-Character Set- Tokens-Keywords and Identifiers-Constants-Variables - Data Types-Declaration of Variables-Assigning Values to Variables-Defining Symbolic Constants-Operations & Expressions-Arithmetic Operators-Relational – Logical-Assignment- Increment & Decrement- Conditional Operator-Bitwise and Special Operator-Arithmetic Expressions-Evaluation of Expressions-Precedence of Arithmetic Operators-Type Conversions in Expressions-Operator Precedence and Associativity- Mathematical Functions.	16
Unit II	Managing I/O operations - Reading a character - Writing a Character - Formatted Input - Formatted Output - Decision Making and Branching - Decision Making with IF Statement-Simple IF Statement - IF…ELSE - Nesting of IF…ELSE Statements - ELSE…IF LADDER - Switch Statement - ?: - GOTO Statement - Decision Making and Looping-WHILE Statement-DO Statement-FOR Statement - JUMP IN LOOPS.	16
Unit III	Arrays-One Dimensional Array-Two Dimensional Arrays-Initializing Two Dimensional Arrays-Multi Dimensional Arrays-Handling of Character Strings-Declaring and Initializing String Variables- Reading Strings from terminal-Writing Strings to Screen-Arithmetic Operations on Characters-Putting Strings Together-Comparison of Two strings-String Handling Functions-Table of Strings-User Defined Functions- Need for User Defined Functions-Form of C Functions- Return Values and their Types-Calling a Function-Category of Functions-No Arguments and No	16

	Return Types-Argument but No Return Types-Arguments with Return Values-Handling of Non-Integer-Functions- Nesting of Functions-Recursion-Function with Arrays-*Scope and Life Time of Variables in Functions.*	
Unit IV	Structures and Unions-Structure Definition-Giving Values to members-Structure Initialization- Comparison of Structure Variables-Arrays of Structures-Arrays with Structures - Structures and Functions-Unions-Size of Structures-Bitwise Fields-Pointers-Understanding Pointers-Accessing the Address of Variables-Declaring and Initializing Pointers-Increments and Scale Factor-Pointer and Arrays-Pointer and Character Strings- Pointers and Functions- Pointers and Structures-Points on Pointers.	16
Unit V	File Management in C-Defining and Opening a File-Closing a File-I/O Operation on Files-Error Handling during I/O Operations-Random Access Files-File Inclusion-*Compiler Control Directives*.	16
	Total Contact Hrs	**80**

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	E.Balagurusamy	Programming in ANSI C (Unit1 to 5)	Tata McGraw-Hill publications, Fourth Edition	2007

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Yashavant Kanetkar,	Let Us C	BPB Publications, 8th Edition	2004
2	Yashavant Kanetkar	Test Your C Skills	BPB Publications, Second Edition	2009

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.R.MALATHI RAVINDRAN Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC102			Title	Batch:	2022 - 2025
				Core II: Data Structures	Semester:	I
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	5		Credits:	04

Course Objective

The course is designed for understanding the basic concepts, terminologies in data structures.To enthuse students knowledge on computer algorithms and able to develop efficient program.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remembering the concepts to use linear and non-linear data structures like stacks, queues , linked list etc.	K1
CO2	Understand and analyze to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures	K2
CO3	Enhance the knowledge to solve problems like sorting, searching, Insertion and deletion of data Operations.	K3
CO4	Analyze the concepts of trees, graphs and its applications.	K4
CO5	Evaluate to learn a number of algorithm design techniques and to Analyze the efficiency and the accuracy of algorithms.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	M	M	H	L	L	M	H	H	M
CO2	H	H	H	M	H	M	M	L	M	H	H	M
CO3	H	H	H	L	H	H	M	M	M	H	H	H

CO4	H	H	H	H	H	H	M	M	M	H	H	H
CO5	H	H	M	M	H	H	M	M	M	H	H	H

Units	Content	Hrs
Unit I	Introduction- Linear data structures: Arrays-Representation of Array-Operations of Array- Stacks - Queues. Linked Lists-Types of Linked Lists-Linked List Operations- Linked Stacks and Queues.	12
Unit II	Trees - Definitions and Concepts- Binary Trees – Representations-Operations-Traversals: In order-Pre order-Post order- Threaded Binary Trees - Binary Search Trees.	12
Unit III	GRAPHS- Terminology –Representations: Adjacency Matrix - Adjacency Lists - Adjacency Multi lists -Depth First Search-Breadth First Search-Shortest paths Dijkstra algorithm- *Minimum spanning Tree*- Kruskal's Algorithm & Prim's Algorithm.	12
Unit IV	Basic Steps-Greedy method- The traveling salesperson problem- Knapsack problem- Job Scheduling Problem- Backtracking- Divide and conquer algorithms-The 8 Queen s problem- Sum of subsets.	12
Unit V	Sorting Techniques: Insertion sort – Merge sort – Quick sort – Heap sort. Searching-Searching Techniques: Linear search –Binary Search.	12
	Total Contact Hrs	60

- The topics given in **Italics** are noted as Self-Study topics.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Elliz Horowitz, SartajSahani	Fundamentals of Data Structures, (Unit 1, 2&3).	Galgotia Publishers	1984

2	Elliz Horowitz, SartajSahani,Sanguthevar Rajasekaran,	Fundamentals of Computer Algorithms, (Unit 4 &5).	Galgotia Publishers,	2008

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Seymour Lipschutz	Data Structures	Mc - Graw- Hill, Indian Adapted Edition	2006
2	Jean-Paul Trembly, PaulG.Sorenson	An Introduction to data structures with application	Mc - Graw- Hill, Second Edition	1991

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.S.NIRAIMATHI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC1A1			Title	Batch:	2022-2025
				Allied – I: Mathematics-I: Computer Oriented Numerical and Statistical Methods	Semester:	I
Lecture Hrs./Week	4	Tutorial Hrs./Sem	5		Credits:	04

Course Objective

This course provides an introduction to the basic concepts and techniques of numerical solution of algebraic equation, system of algebraic equation, numerical solution of differentiation, integration. It also delivers knowledge of various significant and fundamental concepts to inculcate an adequate understanding of the application of Statistical Methods.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall numerical methods to find out the solution of algebraic equations using different methods like Bisection method, Newton Raphson method under different conditions and numerical solution of system of Algebraic equations.	K1
CO2	Understand the properties of Correlation, Regression and compute Karl-Pearson's coefficient of correlation.	K2
CO3	Apply numerical differentiation and Integration whenever and wherever routine methods are not applicable and understand the importance of Interpolation and its application to solve problems for equal intervals and Unequal intervals.	K3
CO4	Analyze the system of linear equations by applying different methodologies.	K4
CO5	Compute and interpret the results of Regression and Correlation Analysis.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H		M	H					M	
CO2	H	L			H	M				M	H	M
CO3	H	M	H		H	H				M	H	M
CO4	H	M	H		M	M				M	M	
CO5	H	L			M	M				M	M	

Units	Content	Hrs
Unit I	Introduction - Bisection Method – Method of Successive Approximations or the Iteration Method- Method of False Position- Newton Raphson Method – Horner's Method	12
Unit II	System of Linear Algebraic Equations- Gauss Elimination- Inverse of Matrix using Gauss Elimination- Gauss Jordan – Triangularization-Gauss Jacobi and Gauss Seidal Method.	12
Unit III	Interpolation and Approximation – Newton, Lagrange's Method- Numerical Differentiation and Integration- Method's Based on Interpolation-Trapezoidal Rule- *Simpson's 1/3 and 3/8th rule*.	12
Unit IV	Correlation Analysis-Meaning-*Types*-Degrees of Correlation-Scatter Diagram-Correlation Graph-Karl Pearson's Coefficient of Correlation- Rank Correlation-Coefficient of Concurrent Deviations-Methods of Least Squares.	12
Unit V	Regression Analysis-Meaning- *Types of Regression* –Regression Equations-Regression Equations from Mean-Regression Coefficients-Properties of Regression Coefficients-Correlation and Regression, a Comparison.	12
	Total Contact Hrs	**60**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

22UBC1A1

Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	P.Kandasamy, K.Thilagavathy, K.Gunavathi	Numerical Methods (Unit 1,2,3)	S.Chand&Company Ltd, First Edition	1999
2	S.P Gupta	Statistical Methods (Unit 4,5).	Sultana Chand & Sons, Thirty-Fourth Edition	2004

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Mark L.Crossley	The Desk Reference of Statistical Quality Methods	American Society for Quality, Quality Press,Second Edition	2008
2	RaoV.Dukkipati	Numerical Methods	New Age International, First Edition	2010

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.S.HEMALATHA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC103			Title	Batch:	2022 - 2025
				Core Lab -I : Programming In C	Semester:	I
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	2

Course Objective

To practice the fundamental programming methodologies in the C programming language via laboratory experiences. To code, document, test, and implement a well-structured, robust computer program using the C programming language. To prepare students to face the challenges and opportunities in the IT industry by building strong foundations in C programming language.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the structure and significance of the C Programming Language.	K1
CO2	Acquire the knowledge about C Programming for various programmingtechnologies.	K2
CO3	Role of constants, variables, identifiers, operators, type conversion and Other building blocks of C Language.	K3
CO4	Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.	K4
CO5	Role of Functions involving the idea of modularity.	K5

Mapping

PO\ PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H		M				M	L	H	M
CO2	H	H	H		H	H	M	H	H	H	H	M
CO3	H	H	M	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	H	H	H	H	H	H	H	H
CO5	H	H	M	H	H	H	H	H	H	H	H	H

1. Write a C program to check to whether the given number is Armstrong number or not.
2. Write a C program to find whether the given number is prime or not.
3. Write a C program to check the greatest among three numbers using the conditional operator.
4. Write a C program to generate the Fibonacci series for the given number.
5. Write a C program to find the addition of matrix.
6. Write a C program to find the matrix multiplication of the given number.
7. Write a c program to display the transpose of a Matrix.
8. Write a C program to find the given string is palindrome or not.
9. Write a C program to count the number of words, characters and lines in a given text.
10. Write a C program using types of functions for the arithmetic operations.
11. Write a C program to calculate the factorial value for the given number using recursion.
12. Write a C program to process a student detail using structures.
13. Write a C program to add the arrays using pointers.
14. Write a C program to create a student file with regno, name, mark1, mark2.
15. Write a C program to create and process an employee file.

Total Contact Hrs 60

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.R.MALATHI RAVINDRAN Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC204			Title	Batch:	2022 - 2025
				Core - III : Object Oriented Programming With C++	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	5		Credits:	4

Course Objective

To develop a greater understanding of the issues involved in programming language design and implementation. To develop an in-depth understanding of functional, logic and object-oriented programming paradigms. To implement several programs in languages other than the one emphasized in the core curriculum. To understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing. To train them to meet day-to-day demands of IT industry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Gain the basic knowledge on Object Oriented concepts.	K1
CO2	Ability to demonstrate applications using Object Oriented Programming Concepts	K2
CO3	Develop the differences between traditional imperative design and object-oriented Design	K3
CO4	Examine class structures as fundamental, modular building blocks	K4
CO5	Explain the role of inheritance, polymorphism, dynamic binding and Generic structures in building reusable code.	K5

Mapping

PO\ PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	H	H	H	M	H	M	H	H	H
CO2	H	H	M	H	H	H	M	H	H	H	H	H
CO3	H	H	M	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	H	M	L	H	M	H	H	H
CO5	H	H	M	H	H	M	L	H	M	H	H	H

22UBC204

Units	Content	Hrs
Unit I	Procedure Oriented Programming-Object Oriented Programming Paradigm-Basic Concepts of Object -Oriented Programming-Benefits of OOP-Object Oriented Languages-Applications of OOP-Steps in Object Oriented Analysis- Steps in Object Oriented Design.	12
Unit II	Tokens-Keywords-Identifiers and Constants-Data Types-Reference Variables-Operators in C++ - Scope Resolution Operator-Member Dereferencing Operator-Memory Management Operators-Manipulators-Type Cast Operators-Expression and their Types-Control Structures.	12
Unit III	Functions: Function Prototype-Call By Reference-Return By Reference-Inline Functions-Default and Constant Arguments-Function Overloading-Friend and Virtual Functions-*Classes and Objects*- Constructors and Destructors.	12
Unit IV	Operator Overloading – Inheritance – Pointers - Virtual Functions and Polymorphism.	12
Unit V	Managing Console Input / Output operations: C++ Streams-C++ Stream Classes-Formatted and Unformatted I/O Operations-Managing Output Manipulations-*Working Files*.	12
	Total Contact Hrs	**60**

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	E.Balagurusamy	Object Oriented Programming with C++ (Unit 1 to 5)	Tata McGraw-Hill Education, Fourth Edition	2008

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	C.Ravichandran	Programming in C++	Tata McGraw Hill Publications, Fourteenth Edition	2001
2	K.R Venugopal, RajkumarBuyya	Mastering C++	Tata McGraw-Hill Education	2017

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.R.MALATHI RAVINDRAN Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC205			Title	Batch:	2022-2025
				Core – IV : Digital Computer Fundamentals	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem			Credits:	04

Course Objective

To provide a comprehensive introduction to digital logic design leading to the ability to Understand the principles, methods and applications of digital computer organization and design.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember how to represent numbers in computers and use problem solving techniques such as flowcharts.	K1
CO2	Acquire knowledge about Boolean algebra and analyze IC digital logic Families.	K2
CO3	Compare various combinational logic circuits.	K3
CO4	Analyze various sequential circuits such as flip – flops, counters and registers.	K4
CO5	Evaluate various components in designing the digital logic circuits.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H		L	M	M		M			M	H
CO2	M	H				H			M		L	M
CO3		H				H	M					
CO4		H				H	M					
CO5	M	M		M	M	H	H	M	H	M	M	H

Units	Content	Hrs
Unit I	Flowchart and Number Systems: Logic and Flowcharting - Flowcharting-Flowcharting Symbols-Program Specification Analysis - Program Specification - Introduction- Input-Output - Throughput. Number system – Digital Computers and Digital Systems – Binary Numbers – Number Based Conversions – Octal and Hexadecimal Numbers – Complements – Binary Codes.	12
Unit II	Boolean Algebra: Boolean Algebra and Logic Gates-Basic Definition – Axiomatic Definition of Boolean Algebra – Basic Theorems and Properties of Boolean Algebra – Boolean Functions – Other Logic Operations – Digital Logic Gates – IC Digital Logic Families – Semiconductor Memory – Bipolar MDS – ROM – RAM – PROM – EPROM - Simplification using the Map method-Product of Sums.	12
Unit III	Combinational Logic: Introduction – Adders – Full Adder – Half Adder-Subtractor – Half Subtractor - Full Subtractor – Multilevel NAND circuits – Multilevel NOR Circuits – Binary Parallel Adder – Decimal Adder – *BCD Adder* – Decoders – Encoder – Multiplexers – De Multiplexers.	12
Unit IV	Introduction – Flip Flops – Triggers of Flip Flops – Flip Flops Excitation Table – Design Procedure – Design Counters – Registers, Counters and Memory Unit. Registers – Shift Registers – Ripple Counters – Synchronous Counters – Timing Sequence.	12
Unit V	Input-Output Devices**:** Punched Tape, Tape Readers – Punched Cards – Card Readers – Alphanumeric Codes – Character Recognition – MICR – OCR – Output Equipment - Printers – CRT Output Devices – Output Offline Operation – Error Detecting and Error Correcting Codes – Keyboards – Terminals – Floppy Disks – Magnetic tape – *Tape Cassettes & Cartridges.*	12
	Total Contact Hrs	**60**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Morris Mano	Digital Logic and Computer Design	Prentice Hall Of India, Third Edition(Unit I to IV)	January 2004
2	J. Maynard	Computer Programming	International Edition(Unit V)	2014

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Donald P Leach,Albert Paul Malvino, GoutamSaha	Digital Principles and Applications	Tata McGraw-Hill, Sixth Edition	2006

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.D.POOBATHY Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC2A2			Title	Batch:	2022 - 2025
				Allied - II : Mathematics II –Mathematical Foundations Of Computer Applications	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	5		Credits:	4

Course Objective

Throughout the course, students will be expected to demonstrate their understanding of Discrete Mathematics by being able to use mathematically correct terminology and notation, to construct correct direct and indirect proofs, to use division into cases in a proof, to use counterexamples and to apply logical reasoning to solve a variety of problems.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Ability to define mathematical logic to solve problems.	K1
CO2	Understand sets, relations, functions and discrete structures.	K2
CO3	Able to use logical notations to discover and reason about fundamental mathematical concepts such as sets relations and functions.	K3
CO4	Able to examine problems and solve matrix.	K4
CO5	Able to evaluate and solve real world problems using graphs and probability.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M		H	H	H	L	M	M	H	H	H
CO2	M	M		H	H	M		M	M	H	M	H
CO3	M	M		H	H	H		M	M	H	M	H
CO4	M	H		H	H	M		M	M	H	M	H
CO5	M	H	H	H	H	H	L	M	H	H	H	H

22UBC2A2

Units	Content	Hrs
Unit I	**Set Theory:** Introduction - SET - Finite Set-Cardinality - SubSet-Equal Sets - Null Set (or) Empty Set- Singleton Set - Universal Set – Union –Intersection - Disjoint Sets - Difference Set - Complement Set - Power Set - Principle of Inclusion and Exclusion - Ordered Pair - Cartesian Products -Partition of Set - Min Sets - Max Set.	12
Unit II	**Functions:** Introduction - Types of Functions - Classification of functions - Algebraic function - Transcendental function - Composition of functions(Simple Problems Only)- Identity function - Inverse of a function(Simple Problems Only) - Characteristic function of a Set (Properties only) -Hashing functions. **Relations:** Binary Relation - Complementary Relation - Inverse Relation-Union and Intersection of two relations - Symmetric Relation - Anti-Symmetric Relation - Reflexive Relation - Transitive Relation-Equivalence Relation(Simple Problemsonly).	12
Unit III	**Graph Theory:** Graph: Undirected Graph -Directed Graph -Multi Graph - Pseudo Graph - Simple Graph - General Graph - Degree of Vertex - Finite Graph -Order ofa Graph - Size of a Graph - Null Graph - Isolated Graph - Regular Graph - Isomorphic Graphs (Simple Problems Only). **Matrix Representation of Graphs:** Adjacency Matrices - Incidence Matrix - *Sub Graph* - Euler Graph - Hamiltonian Graph (Simple Problems Only).	12
Unit IV	**Matrices:** Introduction - Definition - Rank of a Matrix - Elementary Transformations - Solution of a System of linear equations(Simple Problems Only). Eigen values and Eigen Vectors - Singular and Non Singular Matrix –Inverse (or reciprocal) of a Square Matrix –Adjoint of a Square Matrix(Simple Problems Only).	12
Unit V	**Discrete Probability :**Introduction - Sample space – Event - Exhaustive event - Favorable event - Mutually exclusive events - Equally likely events - Independent events – Probability - Axioms of probability - Extension of general law of addition of probabilities - Conditional Probability - Multiplication law of Probability - Multiplication law of Probability for independent events - *Extension of multiplication law of probability* - Total Probability - Baye's theorem (Simple Problems only).	12
	Total Contact Hrs	**60**

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

22UBC2A2

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	P.Geetha	Discrete Mathematics (Unit 1 to 4)	Scitech Publications (india) pvt. Ltd., chennai	2011
2	Dr.M.K.Venkataraman, Dr.N.Sridharan,	Discrete Mathematics (Unit 5)	National Publishing Company, First Edition	2000

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ralph P.Grimaldi	Discrete and Combinatorial Mathematics - An applied introduction,	Fifth Edition, Addison Wesley Publishing Company	2006
2	Tremblay J. P and Manohar R,	Discrete Mathematical Structures with Applicationsto Computer Science	Tata McGraw Hill	2001

Course Designedby	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.R.MALATHIRAVINDRAN Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC206			Title	Batch:	2022 – 2025
				Core Lab - II : Programming In C++	Semester:	II
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	2

Course Objective

To provide in-depth coverage of object oriented programming principles and techniques using C++. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features. To develop competent technical writing skills using C++ programming so as to enable the graduate to meet the requirement.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the structure and significance of the C++ Programming Language.	K1
CO2	Acquire the knowledge about C++ Programming for various programming technologies.	K2
CO3	Demonstrate the ability to analyze, use, and create functions, classes, to overload operators.	K3
CO4	Demonstrate the ability to understand and use inheritance and Pointers when creating or using classes and create templates.	K4
CO5	Demonstrate the ability to understand and use Exception handling and file handling mechanism.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M	H		M				M	L	H	M
CO2	H	H	H		H	H	M	H	H	H	H	M
CO3	H	H	M	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	H	H	H	H	H	H	H	H
CO5	H	H	M	H	H	H	H	H	H	H	H	H

1. Write a program in C++ to exchange the content of two variables using call by reference.
2. Write a program in C++ to create the class shape, and overload the function to return the perimeters of the different shapes.
3. Write a program in C++ to sort the integer array.
4. Write a program in C++ to demonstrate constructor with default argument.
5. Write a program in C++ to demonstrate destructor in inheritance.
6. Write a program in C++ to change the sign value of the inputs by using overloaded unary operator.
7. Write a program in C++ to demonstrate binary operator for the matrix class.
8. Write a program in C++ to demonstrate multiple inheritances.
9. Write a program in C++ to copy the content of file into another.
10. Write a program in C++ to append the content of the file.
11. Write a program in C++ to create a file.
12. Write a program in C++ to demonstrate virtual function.
13. Write a program in C++ to demonstrate friend function.
14. Write a program in C++ to implement a Class Matrix that adds, subtracts and initializes the matrix.
15. Write a program in C++ to create random access file, add a new record to the file, modifies the details of a record and displays the contents of the file.

Total Contact Hrs 60

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Course Designedby	**HOD**	**CDC**	**COE**
Name andSignature	**Name andSignature**	**Name andSignature**	**Name andSignature**
Name: Dr.R.MALATHIRAVINDRAN Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC307			Title	Batch:	2022-2025
				Core V: Relational Database Management System and Oracle	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem			Credits:	04

Course Objective

This course provides a foundation in data management concepts and database systems. It includes representing information with the relational database model, manipulating data with an interactive query language (SQL). This course focus on relational database management systems, including database design theory: E-R modeling, data definition and manipulation languages, database security and administration. It also provides students with theoretical knowledge and practical skills in the use of databases and database management systems in information technology applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic concepts of Database and Database Management System software	K1
CO2	Understand the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.	K2
CO3	Solve Database problems using Oracle SQL and PL/SQL. This will include the use of Procedures, Functions and Triggers.	K3
CO4	Examine entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.	K4
CO5	Explain the usage of normalization technique and functional dependency in database design.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			H	H	M		M		H	H
CO2	M	H	M		H	H	M		H		H	H
CO3	H	H	M		H	H	H		M		H	H

CO4	H	M			H	M	M		M		H	H
CO5	H	H	M	M	M		M		L		H	H

Units	Content	Hrs
Unit I	Introduction - Database System - Applications - Database System Vs File Systems - View of Data- Data Models - Database Language - Database Users And Administrators –Transactions Management –Database System Structure –Application Architecture. Entity–Relationship Model - Basic Concepts – Constraints Keys - Design Issues – ER Diagram – Weak Entity Sets – *Extended ER Features* - Design of ER Database Scheme -Reduction of ER Scheme to Tables.	12
Unit II	Relationship Model - Structure of Relational Database – The Relational Algebra – Extended Relational Algebra Operation - Modification of Database – Views - The Tuple Relational Calculus - *The Domain Relational Calculus.*	12
Unit III	Integrity and Security – Domain Constraints – Referential Integrity – Assertion – Triggers –*Security and Authentication* – Authorization in SQL- Encryption and Authentication. Relational Database Design – First Normal Form – Pitfalls in Relational Database Design – Functional Dependencies – Decomposition – Desirable Properties of Decomposition – BCNF (Boyce Code Normal Form) - Third Normal Form – Fourth Normal Form – *More Normal Form.*	12
Unit IV	ORACLE: Introduction – CODD's Rule – Tools of ORACLE - Introduction to SQL – *Benefits of SQL* - Data Types – DDL – DML –DCL - TCL - Data Constraints. ORACLE SQL Functions –Single Row Functions: Date, Number, Miscellaneous, Conversions, Character Functions - Group Functions – SQL Operators: Arithmetic, Comparison and Logical Operators – Set Operators – Joins – Sub Queries – Views.	12
Unit V	PL/SQL : Introduction–Advantages of PL/SQL – Architecture of PL/SQL – Introduction to PL/SQL Block - Data Types – Control Structures - *Concepts of Error Handling* – Cursor - Procedure - Functions – Triggers - Types of Triggers. *Case Studies: Practical Applications in Real Time Environment*	12
	Total Contact Hrs	**60**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

22UBC307

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Silberschatz, Korth,Sudarshan	Database System Concept (Unit 1,2&3)	5th Edition, McGraw – Hill International Edition	2006
2	Ivan Bayross	SQL & PL/SQL Using ORACLE 8*i* and 9*i* (Unit 4 & 5)	BPB Publications	2003

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	BipinC.Desai	An Introduction to Database System	Galgotia Publications	2012
2	C.J.Date	An Introduction to Database System	Eigth Edition, Pearson Education	2003

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.S.HEMALATHA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC308			Title	Batch:	2022 - 2025
				Core - VI : Operating System & Linux	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	4

Course Objective

To learn concepts relating to structure of operating systems and its functions are including processor scheduling, memory management, and device management. This also covers OS strategies such as concurrency, deadlocks and file system organization. It helps to implement programs in Linux environment.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the concept of computer operating systems and its features.	K1
CO2	Understand types and history of operating systems and able to explain modern operating systems and its evolution over the time period.	K2
CO3	Describe how operating systems like Linux and windows will meet the future and real-life needs with respect to efficiency, storage, speed and Security.	K3
CO4	Analyze various operating system functions including memory Management, process management and deadlock prevention strategies.	K4
CO5	Evaluate security, multiprocessing features provided by the Unix operating system using Unix commands, Vi editor and Shell programming.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	H	H	M	M	L	L	M	H	H
CO2	M	H	M	L	L	L	M	M	H	M	M	H
CO3	M	H	M	H	H	H	H	L	H	H	M	H

CO4	H	M	L	L	M	M	M	L	L	L	H	M
CO5	H	H	L	M	H	H	H	L	M	H	H	H

Units	Content	Hrs
Unit I	Introduction to OS – Early History – Hardware: Interrupts and Polling, Buffering, Storage Protection, Online – Offline Operation-Cycle Stealing- Processing-Storage Hierarchy-Reduced Instruction Set Computing (RISC).Semaphores – Process Synchronization with Semaphores – Counting Semaphores. Storage Management: Real Storage – Storage Organization – Storage Management Storage Hierarchy – Swapping – Virtual Storage – Basic Concepts.	12
Unit II	PAGING: Basic Concepts – Segmentation. Dead Lock: Examples – Dead Lock Preventions – Dead Lock Avoidance – Bankers Algorithms Only – Dead Lock Detection – Dead Lock Recovery. Processor Management: Job and Processor Scheduling – Introduction – Scheduling Levels – Scheduling Objectives – Preemptive Vs Non preemptive Scheduling – Priorities – FIFO Scheduling – Round Robin Scheduling – Quantum Size Shortest Job First Scheduling – Shortest Remaining Time Scheduling – Highest Response Ratio Next Scheduling.	12
Unit III	Auxiliary Storage Management: Disk Performance Optimization – Why Disk – Scheduling is Necessary – Desirable Characteristics of Disk Scheduling Policies – Seek Optimization – Disk Caching – RAM Disks. FILE Database System: Introduction – The File System – File System Functions – Blocking and Buffering – File Organization – Allocating and Freeing Space – File Description – Access Control Matrix – Access Control by User Classes – Backup Recovery.	12
Unit IV	Linux: Introduction – File structure of Linux – Directory hierarchy – Environmental variables –file access permissions –utility commands- files – print – login details. VI-editors - Three modes. File splitting – pipes and filters – paginating files – head – tail – grep – process termination – timing process.	12
Unit V	Shell Programming: Creation and execution – command line arguments – logical operations – condition statements – System administration – Booting and shutting down – super user status – Disk management – security – user services – mount – unmount- Installing and managing printers.	12
	Total Contact Hrs	**60**

Pedagogy and Assessment Methods:

22UBC308

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	H. M. Deitel	Operating Systems (Unit 1 to 3)	Wesley Publication, Third Edition	2004 (Unit 1,2 & 3)
2	Sumitabha Das	Unix, Concepts and applications (Unit 4, 5)	Tata McGraw Hill, Fourth Edition	2006 (Unit 4 & 5)

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Stewart E. Madnick, John J.Donovan	Operating Systems	Tata McGraw Hill, Sixth Edition	2008
2	Williams Stallings	Operating Systems- Internals and Design Principles	Prentice hall of India, Fifth Edition	2005
3	Mark.G. Sobell	Practical Guide to Red Hat Linux	Pearson Edition, Third Edition	2007
4	Andrea Arpaci Dusseau Rezi Arpaci Dusseau	Operating Systems: Three Easy Pieces	Kindle Edition	2015

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.B.AZHAGUSUNDARI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC3A3			Title	Batch:	2022-2025
				Allied - III : Accountancy for Decision Making	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	04

Course Objective

To enlighten the students on the basics of Accountancy

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Provide the knowledge of accounting theory based on conceptual framework of accounting.	* K1
CO2	Enable students to understand the concept of accounting.	*K2
CO3	Impart knowledge accounting in decision making.	*K3
CO4	Analyze and interpret accounting related transactions in accordance with accounting theory.	*K4
CO5	summarize ratio analysis and fund flow statement	*K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M	H	H	H	L	H	H	H	H	H	M
CO2	H	H	H	M	H	M	H	H	H	H	H	H
CO3	H	H	H	H	H	H	H	M	H	M	H	H
CO4	H	H	M	H	M	H	H	M	M	H	H	H
CO5	H	M	H	M	H	M	M	M	H	H	H	M

Units	Content	Hrs
Unit I	**Financial Accounting** Meaning – Definition – Concepts – Conventions –Accounting Cycle – Methods of Book Keeping– Journal – Ledger –Trial Balance.	12
Unit II	**Subsidiary Books and Final Accounts** Subsidiary Books – Purchase Book and Sales Book – Purchase Returns and Sales Returns Book – Cash Book - Single column- Double Column- Triple column Cash book - Preparation of Final Accounts with Simple Adjustments	12
Unit III	**Cost Accounting** Meaning – Definition- Objectives - Elements of Cost – Cost Sheet – Meaning – Definition - Methods of Stock Valuation – FIFO - LIFO – Simple Average Method.	12
Unit IV	**Management Accounting** Meaning -Definition -Objectives of Management Accounting - Budgetary Control – Cash Budget –Flexible Budget– Material Budget- Sales Budget (Simple Problems)	12
Unit V	**Ratio Analysis and FFS** Meaning - Types – Liquidity Ratio – Profitability Ratio – Solvency Ratio - Cash flow Statement- Meaning- Procedures for preparing Cash Flow statement (Simple Problems only)	12
	Total Contact Hrs	**60**

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

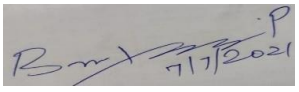
Distribution of Marks: 20 % Theory & 80 % Problems

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Sharma. K, Shashi..K.Gupta	ManagementAccounting	Kalyani Publishers, New Delhi	2020

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Jain. S.P and Narang. K.L	Cost Accounting	Kalyan Publishers, New Delhi	2020
2	Shukla. M.C And Grewal. T.S And Gupta. S.L	Advanced Accountancy	S.Chand And Co. New Delhi	2020
3	Dr.K.L.Gupta	Accountancy for Managerial Decisions	Sahitya Bhawan Publications	2020

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.T.S.Kavitha Signature:	Name: Dr.P.Bruntha Signature: 	Name: (Mr.K.Srinivasan) Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC309			Title	Batch:	2022 - 2025
				Core LAB –III: Relational Database Management System And Oracle	Semester:	III
Practical Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	02

Course Objective

The major objective of this Lab is to provide a strong formal foundation in database concepts. It demonstrates the use of constraints and various types of SQL functions. It also emphasizes the importance of normalization in database and facilitates the students in Database Design.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember Structured Query Language (SQL) queries using DDL, DML, DCL and TCL commands.	K1
CO2	Understand various queries execution such as relational constraints, joins, set operations, aggregate functions, trigger and views.	K2
CO3	Apply Normalization concepts in a database.	K3
CO4	Analyze the techniques used to design and create Relational Database.	K4
CO5	Evaluate options to make informed decisions that meet data storage, processing and retrieval needs.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H	M		H	H	M	L	M		H	H
CO2	H	M	M		H	H	M		M		H	H
CO3	H	M			H	M	M				M	M
CO4	H	H			H	M	H		H		M	H
CO5	H	H		M	H	H	M	M	H	H	M	H

1. Write Oracle Queries in Data Definition Language.
2. Write Oracle Queries in Data Manipulation Language.
3. Write Oracle Queries in Transaction Control Language.
4. Write Oracle Queries in Data Control Language.
5. Write Oracle Queries using Data Constraints.
6. Manipulate Single Row Function.
7. Manipulate Function – Group function.
8. Generate Operators in SQL plus.
9. Manipulate SET Operators.
10. Generate View.
11. Generate Join functions.
12. Write PL/SQL to find whether the given number is Even or Odd.
13. Write PL/SQL to find whether the given number is Armstrong or Not.
14. Write PL/SQL to Display ten numbers.
15. Write PL/SQL to reverse of given number.
16. Write PL/SQL to find whether the given number is Prime number or not.
17. Write PL/SQL queries to create Procedure.
18. Write PL/SQL queries to create Function.
19. Write PL/SQL queries to create Cursor.
20. Write PL/SQL queries to create Trigger.
21. Write PL/SQL to Access Restriction Trigger.
22. Create a real time application using Master and Transaction tables.

Total Contact Hours : 75

Course Designed by	**HOD**	**CDC**	**COE**
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.S.HEMALATHA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC310			Title	Batch:	2022 - 2025
				Core Lab - IV : Programming in Linux	Semester:	III
Practical Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To familiarize with the Linux commands, environment, fundamentals of shell scripting and programs on basic Linux administration.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Apply the various commands in terminal to handle UNIX system files.	K3
CO2	Analyze Linux commands using file and system security	K4
CO3	Discuss shell code in VI editors to solve various problems.	K5
CO4	Analyze and Create file systems and directories	K4
CO5	Distinguish various filter and Pipes commands	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	L	M	L	L	H	M	M
CO2	H	M	M	H	M	H	L	L	M	M	H	H
CO3	H	M	H	H	H	H	H	M	H	H	H	H
CO4	H	M	L	H	M	H	L	L	M	L	H	M
CO5	H	M	H	M	L	M	H	M	L	M	H	M

1. Work with utility commands.
2. Work with directory commands.
3. Work with handling file commands.
4. Work with file access commands.
5. Work with pipes and filters.
6. Work with VI editors.
7. Create a program to find simple interest
8. Create a program to find factorial value
9. Create a program to find Fibonacci series.
10. Create a program to find sum of N numbers.
11. Write a program with case condition.
12. Create a program to find reverse the digit.
13. Create a program to find sum of individual digit.
14. Create a program to swap any two numbers.
15. Create a program for sorting of N numbers.

Total contact hours : 75 hrs

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.B.AZHAGUSUNDARI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC3N1			Title	Batch:	2022 - 2025
				Non Major Elective - I : Web Designing Lab	Semester:	III
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To provide the necessary knowledge of various techniques in web development and will be able to design a complete website.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the concepts of website Development	K1
CO2	Demonstrate knowledge and skills utilizing various HTML tags for Designing a static web page.	K2
CO3	Analyze the HTML tags, CSS and JavaScript.	K3
CO4	Recognize and apply the elements of Creating Style Sheet (CSS).	K4
CO5	Develop and incorporate dynamic capabilities in Web pages using JavaScript.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	M	M	H	M		M	H	H	M	M
CO2	M	H		H	M	M	M		M	M	M	M
CO3	M	H		H	H	M		H	M	M	H	M
CO4	M	H		H	M		M	H	H		M	H
CO5	H	H		H	M		M	H	M	M	M	M

1. Design a home page which will display your information i.e. Bio data.
2. Create Hyperlinks in home page i.e educational details, Hobbies, Achievement, My Ideals etc.
3. Design a timetable and display it in tabular format.
4. Design a Registration form in HTML.
5. Design a webpage for Bio data using CSS.
6. Design webpage using Frames, Framesets.
7. Embedding JavaScript's in HTML pages.
8. Design a Bio data page whose content can be changed using JavaScript like events.
9. Design a Signup form with all validations.

Total contact hours : 15 hrs

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIP KUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	21UBC3N2			Title	Batch:	2022-2025
				Non Major Elective - I : Desktop Publishing Lab	Semester:	III
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

The course is designed to provide a deep knowledge in various image processing tools andeffects**.**

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic technical and handling tools.	K1
CO2	Understands the various concepts of Photoshop.	K2
CO3	Apply various effects that is suitable to access various formats in this platform for editing.	K3
CO4	Analyze the concepts of different modes in Photoshop.	K4
CO5	Emphasis is placed on desktop concepts desktop applications, learning and working in the desktop environment.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			M	H		M	H		H	M
CO2	H	M	M	M	H	M	M		L	M	H	H
CO3	M	H		M	H	H	M	M	H	H	H	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	M	H		M	H	H	M	M	H	H	H	H

1. Design the Wedding Invitation using the associated tools in Photoshop.
2. Apply special art effects for the image using various options from the Filter Gallery.
3. Design the Banner.
4. Implement the Usage of different modes in a Single Image.
5. Design the College Profile.
6. Work with different images to implement Sharpen tool and Smudge Tool
7. Design the Calendar.
8. Edit the image using Blur tool.
9. Design the Visiting Card.
10. Edit the image using Burn and Sponge tool.
11. Edit the image using Clone tool.

Total Contact Hrs 15

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.A.MURUGANANDHAM Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC3VA			Title	Batch:	2022-2025
					Semester:	III
Lecture Hrs./Week		Tutorial Hrs./Sem		VAC I: PC Assembly & Troubleshooting	Credits:	2*

Course Objective

At the end of the program the students will be able to understand the basics of assembling a computer& installing OS.

Course Outcomes (CO)

K1	CO1	To Demonstrate knowledge & Concepts of Computer Fundamentals.
K2	CO2	To know the Installation of Operating System and preventive maintenance.
K3	CO3	To know how to Perform a step by step assembly of a computer.

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	H			M	H	H	M
CO2	H			M	H	H	M		H	H	H	H
CO3	H	H	M	M	H	H		M	H	H		H
CO4	M	M	M		M	M				H	M	M
CO5	H	M		M	H	H	H		H	H	H	H

Units	Content	Hrs
Unit I	Introduction - Steps for assembling a PC - Commonly used devices an overview - Assembling a SMPS in a cabinet - Fixing a processor in a mother board- Assembling RAM in mother board - Pinning a cooling fan in a mother board.	10
Unit II	Assembling a hard disc drive in a cabinet - Assembling a CD/DVD ORM in a cabinet- Assembling a floppy drive in cabinet -Fixing motherboard in a cabinet -Steps for installing windows 2007 & windows XP, Software - Trouble Shooting:Dos, XP, 2000 - Installation of Software program. Fixing wires for power restartswitches, fixing wires for power & HDDLED's, fixing wires for external USB and Audio connections.	10
Unit III	Protocols and the magicol protocols, in particular, TCP/IP-Working with name-Resolution -IP address allocation-Active Directory–Trouble shooting.	10
	Total Contact Hrs	**30**

Text Book 23UBC6VA

S.NO	AUTHOR	TITLEOFTHEBOOK	PUBLISHERS\ EDITION	YEAR OF PUBLICATION
1	Ben Hubbard Readand Learn: Our Digital Planet, Ben Hubbard	How Computers Work (Unit 1, 2)	Heinemannreadand learn Our Digital Planet Series, Raintree,	2018
2	Toby Velte, Anthony Velte	Cisco A Beginner's Guide (Unit 3)	5 th Edition	2013

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIPKUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC411			Title	Batch:	2022-2025
				Core – VII: Visual Programming	Semester:	IV
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	03

Course Objective

The course gives introduction to the .Net framework, library and various applications involved in it. It enables the students to learn and develop Windows and Web applications for the .NET platform.

Course Outcomes (CO)

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

CO Number	CO Statement	Knowledge Level
CO1	To understand the concepts of the .NET framework as a whole and the technologies that constitutes the framework.	K1
CO2	Knowledge on ADO.NET with ASP.NET for creating web based data centric applications. Also understand web services.	K2
CO3	Understand the ASP.NET architecture, web server controls, rich web controls and validation controls, Analyze security management in ASP.NET.	K3
CO4	Use ADO.NET in a web application to read, insert, and update data in a database.	K4

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			M	H		M	H		H	M
CO2	H	M	M	M	H	M	M		L	M	H	H

CO3	M	H		M	H	H	M	M	H	H	H	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	M	H		M	H	H	M	M	H	H	H	H

Units	Content	Hrs
Unit I	**Introduction to .NET:** Understand .NET Framework – .Net Architecture –CLR, base class library VB .Net : Visual Basic.Net IDE, Compiling and Debugging.	12
Unit II	**ASP.NET BASICS:** Introduction –ASP.NET architecture - ASP.NET Runtime- Internet Information Services - Visual Web Developer Web Server – ASP.NET Parser – Assembly.	12
Unit III	**WINDOW AND WEB BASED APPLICATIONS** Window Based Applications – Core ASP.NET – ASP.NET Web Forms – Server Controls, Data Binding – ASP.NET -Error Handling, Security, Deployment- Validation Controls - Ad rotator Controls- Security.	12
Unit IV	**ASP.NET Database Programming** Introducing ADO.NET- ADO.NET Basics- ADO.NET Object Model: Data Provider, Data Reader, at Adapter-Data Set -Managed Providers- Understanding Data Binding- Working with Data Grids- Using SQL Server with ASP.NET.	12
Unit V	**Advanced ASP.NET** ASP.NET Application Configuration-Understanding Caching-Localizing ASP.NET Applications-Deploying ASP.NET Applications-Web Services-Web Services Infrastructure-Understanding SOAP-Building a Web Service.	12
	Total Contact Hrs	**60**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Matthew Mac Donald	The Complete Reference ASP.NET"(Unit 1, 3)	Tata McGraw-Hill Edition	2009
2	Mridula Parihar	ASP.NET Bible (Unit 2, 4, 5)	John Wiley	2002
3	Bill Evjen, Hanselman, Muhammad, Sivakumar& Rader	Professional ASP.NET 2.0 (Unit 3)	Wiley India(p) Ltd.	2006

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Andrew Troelsen,	Pro C# 5.0 and the .NET 4.5 Framework	A press publication	2012
2	Mike Yenderloy	ADO & ADO.Net programming	BPB publications	2002
3	Mc Downell	ASP.NET complete reference	Sahitya Bhawan Publications	2007

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.R.Malaathi Ravindran Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC412			Title	Batch:	2022-2025
				Core - VIII : Java Programming	Semester:	IV
Lecture Hrs./Week	4	Tutorial Hrs./Sem			Credits:	03

Course Objective

This course aims to create an environment to understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. It also helps to test Java servlets while developing Java programs which incorporate advanced graphic functions.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the structure and significance of the Java Programming Language.	K1
CO2	Acquire the knowledge about Java Programming Language for various programming technologies.	K2
CO3	Apply the concept of Inheritance and various Java Components.	K3
CO4	Analyze the usage of event handling on AWT and Swing components	K4
CO5	Evaluate the Internet Programming using Java Applets.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M	H		M				M	L	H	M
CO2	H	H	H		H	H	M	H	H	H	H	M
CO3	H	H	L			M			H	H	H	H
CO4	H	H	L			M			H	H	H	H
CO5	H	H	L	H		H	H	H	H	H	H	H

Units	Content	Hrs
Unit I	Java Evolution - Overview of Java language, Constants, Variables and Data types - Operators and Expressions. Decision Making and Branching - Decision Making and Looping - Classes, Objects and Methods - Arrays, Strings and Vectors.	15
Unit II	Inheritance - Packages: Putting Classes Together-Multithreaded Programming - *Managing Errors and Exceptions.*	15
Unit III	Applets Programming - Graphics Programming - The Graphics Class - Lines and Rectangles - Circles and Ellipses - Drawing Arcs - Drawing Polygons.	15
Unit IV	A Tour of Swing: Japplet - Icons and Labels - Text Fields – Buttons - The JButton Class - Check Boxes - Radio Button - Combo Boxes - TabbedPane - Scroll Panes - Tree - JMenus.	15
Unit V	Servlet Overview and Architecture: Movement to Server Side Java - What is 12Java Servlet - Practical Applications for Java Servlet - *Java Servlet Alternatives - Reasons to use Java Servlets - Java Servlet Architecture.*	15
	Total Contact Hrs	**75**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	E.Balagurusamy	Programming with Java (Unit 1 to 5)	Tata McGraw Hill	2007
2	Herbert Schildt	Java: The Complete Reference(Unit 1 to 5)	Tata McGraw Hill	2005
3	James Goodwill	Developing Java Servlet (Unit 5)	Tech media	1999

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	James Keogh, Jim Keogh	J2EE: The Complete Reference	McGraw-Hill/Osborne, Seventh Edition	2002
2	Bruce W.Perry	Java Servlet and JSP Cookbook	O'Reilly	2004

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.UMAMAHESWARI.D Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4A4			Title	Batch:	2022-2025
				Allied - IV : Mathematics III - Computer Based Optimization Techniques	Semester:	IV
Lecture Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	03

Course Objective

The course provide with the basics of various optimization techniques, the key concepts of linear programming, Transportation, Assignment problem, PERT & CPM. It also offers various mathematical applications in industries and Decision making for real time environment.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the modeling and computational tools as well as analytic skills to evaluate the problems.	K1
CO2	Understand and explain the various mathematical formulations.	K2
CO3	Apply Working with Non Linear programming Problems.	K3
CO4	Analyze Linear Programming problem and similar such problems In to appropriate forms and problem solving.	K4
CO5	Estimate the problem situation for better decisions.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M		H	M			M	H	M	H	M
CO2	M	M		H	H				H	M	M	H
CO3	M	H		H	H	M		M	M		M	M

CO4	M	H		H	H	M		M		M	M	H
CO5	M	H	M	H	H	M		M	M		M	H

Units	Content	Hrs
Unit I	Linear Programming Problem: Graphical Solution Method- General Linear Programming Problem (Definition alone) - Canonical and Standard forms of LPP. Simplex Method: Basic Solution and Degenerate Solutions to Linear Equation- Simplex Method- Big M Method (Only Simple Problems).	12
Unit II	Transportation Problem: North West Corner Method- Least Cost Method- Vogel's Approximation Method- Moving towards optimality UV Method. Assignment Problem: Definition- Assignment Algorithm-Hungarian Assignment Method- Unbalanced AP.	12
Unit III	Inventory Control: Introduction- *Types of Inventory*- Inventory Decision- Economical Order Quantity (EOQ) - Deterministic Inventory Problems.	12
Unit IV	Sequencing Problems: Introduction- Problems with n Jobs and 2 Machines- Problems with n Jobs and k Machines- Problems with 2 Jobs and k Machines (Simple Problems).	12
Unit V	Network Scheduling: Introduction- Network and Basic Components- *Rules of Network Construction*- Time calculation in Networks-CPM-PERT-PERT Calculations- Difference between CPM and Pert Network.	12
	Total Contact Hrs	**60**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

22UBC4A4

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Kanti Swarup, P.K.Gupta, Man Mohan	Operations Research (Unit 1 to 5)	Sultan Chand & Sons	1996

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	R. PaneerSelvam	Operations Research	Prentice Hall of India Pvt Ltd.	2004

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.A.MURUGANANDHAM Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	21UBC413			Title	Batch:	2022-2025
				Core Lab - V: Visual Programming	Semester:	IV
Practical Hrs./Week	4	Tutorial Hrs./Sem			Credits:	02

Course Objective

To develop the practical aspects of application using fundamentals of ASP.Net and C#. To gain the knowledge of Web server controls, Form validation, Session handling, Error handling, Inheritance, File operations and ADO.Net connectivity.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the ASP.Net applications using standard .net controls	K1
CO2	Understand the decision making statements and user interfacing controls	K2
CO3	Implement and deploy database connection management using ADO.NET	K3
CO4	Analyze simple data binding applications using ADO.Net Connectivity	K4
CO5	Evaluate web-based applications by using various web controls in ASP.NET.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1		H		M	M	M	M	M	M	H	H	M
CO2	M	M			H	H	M	H	M	H	H	M
CO3		H		M	H	M	H	M		H	H	H

CO4	M	M		H	M	M	M	H	M	M	M	H
CO5	M	H		H	H	H	M	H	H	H	H	H

1. Create a windows form with the following controls Textbox, Radio button, Check box, Command Button
2. Write a program for Menu option.
3. Create a program to connect with database and manipulate the records in the database using ADO .NET
4. Create a program to implement the concepts of OOPS for creating class with inheritance.
5. Create a program to perform input validation using procedure.
6. Write a program to open a file and using I/O operations write contents into a file and read the contents from the file.
7. Create a window form using HTML controls.
8. Create a program to perform validation using validation controls.
9. Create a program in ASP .NET to connect with the database using ADODB connectivity and manipulate the records.
10. Write a program to store the employee details using class and methods in C# .NET
11. Write a program to Handle Exceptions
12. Write a program to create a form with Basic controls in c#. NET.
13. Write a program in ASP to display the session properties.
14. Write a program in ASP that makes use of Ad rotator component.
15. Write a program in ASP that makes use of Browser capabilities component.

Total Contact Hours : 60

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.N.DIVYA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC414			Title	Batch:	2022 - 2025
				Core Lab - VI: Java Programming	Semester:	IV
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To provide students with the ability to write programs in Java and Advanced Java by applying concepts described in the Object-Oriented Programming course and develop their programming career.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the concepts of Object-Oriented Programming.	K1
CO2	Understands the concepts of Multithreading and Method Overriding.	K2
CO3	Apply the concept of Applets and Servlets.	K3
CO4	Analyze the concepts of JMenu, JTabbedPane and JTree.	K4
CO5	Evaluate the usage of Generic Servlets and HTTP Servlets.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H	M		M	M					M	H
CO2	H	M	M	M	H	M	M		L	M	H	H
CO3	H	H	L		M	M		H	H	H	M	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	H	H		H	H	M	M		M	M	H	M

1. Write a java program for employee details using single inheritance concept.
2. Write a java program to check the given string is palindrome or not.
3. Write a java program for multithreading concept.
4. Write a program in java to read and write using random access file.
5. Write a java program to draw lines and rectangles using applets.
6. Write a program in java for method overriding.
7. Write a program in Java using the concept of interface.
8. Write a program to add two numbers using applets.
9. Write a program to implement the concept of swing.
10. Write a program to implement the concept of JMenu, JMenuBar.JMenuItem.
11. Write a program to implement the concept of JTabbedPane.
12. Write a program to implement the concept of JTree.
13. Write a program to make use of Generic Servlet.
14. Write a program to make use of HTTP Servlet.
15. Write a program to illustrate servlet chaining.

Total Contact Hours : 60

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.UMAMAHESWARI.D Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4S1			Title	Batch:	2022-2025
				SEC II: Naan Mudhalvan: Cloud Computing	Semester:	IV
Practical Hrs./Week	2	Tutorial Hrs./Sem.			Credits:	2

Course Objective

To provide students with the fundamentals and essentials of Cloud Computing. To provide students a sound foundation of the Cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the Concepts of Cloud computing	K1
CO2	Understand the Could computing fundamentals.	K2
CO3	Apply the fundamental concepts in datacenters to understand the trade offs in power, efficiency and cost.	K3
CO4	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.	K4
CO5	Analyze various cloud programming models and apply them to solve problems on the cloud.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H		H	M		M	H	H		M	H
CO2	H	H		H	M	M	M	M	M	H	M	H
CO3	H	H		H	M		M	H	M	M	M	M
CO4	H	M		M	M	M	M	H	M	H	M	H
CO5	M	H		H	H	M		H	M	M	H	M

1. Creation of Virtual Machines
2. Execution of a sample program in a virtual machine
3. Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8.
4. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs.
5. Install Google App Engine. Create hello world app and other simple web applications using Python /java.
6. Use GAE launcher to launch the web applications.
7. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
8. Find a procedure to transfer the files from one virtual machine to another virtual machine.
9. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
10. Install Hadoop single node cluster and run simple applications like wordcount.

Total Contact Hours :15

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.A.MURUGANANDHAM Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4S2			Title	Batch:	2022-2025
				SEC II: Naan Mudhalvan: DevOps Foundation	Semester:	IV
Practical Hrs./Week	2	Tutorial Hrs./Sem.			Credits:	2

Course Objective

Provides the foundations of knowledge, principles and practices from a technical perspective needed to engineer a successful DevOps solution.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the Concepts of DevOps Foundation	K1
CO2	Understand the DevOps Foundation fundamentals.	K2
CO3	Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.	K3
CO4	Identify resource management fundamentals	K4
CO5	Analyze various cloud programming models and apply them to solve problems on the DevOps	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H		H	M		M	H	H		M	H
CO2	H	H		H	M	M	M	M	M	H	M	H
CO3	H	H		H	M		M	H	M	M	M	M
CO4	H	M		M	M	M	M	H	M	H	M	H
CO5	M	H		H	H	M		H	M	M	H	M

1. Installing Git- Installing on Linux, Installing on Windows, Initial setup
2. Execute some commands to test connection between knife and workstation
3. Create organization and add yourself and node to organization
4. Create a server and add to organization and Check node details using knife
5. How to Add Run list to Node and Check node Details
6. Create a Environments and add servers to environments
7. Create a program for roles and add Roles to organization
8. Develop Understanding of Attributes, Creating Custom Attributes and Defining in Cookbooks
9. Creating and managing the data bags
10. Creating the data bags using CLI and Chef Console
11. Sample data bags for Creating Users

Total Contact Hours :15

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.A.MURUGANANDHAM Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4N1			Title	Batch:	2022 - 2025
				Non Major Elective - II : Photo Effects Lab	Semester:	IV
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To learn the various photo editing features and animation techniques and demonstrate proficiency in developing the multimedia presentations.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the basic elements and principles of photo editing software to Achieve a great photo effect by applying effects.	K1
CO2	Understand the important aspects of Adobe Photoshop Elements.	K2
CO3	Construct simple documents utilizing selections, layers, and blending Modes.	K3
CO4	Analyze color management and correction techniques in Adobe Photoshop.	K4
CO5	Evaluate simple shapes using animation editing software and design simple animation by applying shape tweens and motion tweens	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H			H			M		H	H	H
CO2	H	H	M		H	H	H	H	M	H	H	H
CO3	H	M		M	H	H		H	M	H	H	M
CO4	H	H	H			H	H			H	H	H
CO5	H	H	H			H	H			H	H	H

1. Create a Business Card. 2. Create a Monthly Calendar. 3. Change the Background Transparent and Save it in Transparent Image. 4. Create a Poster with a Fancy Font. 5. Convert Blur Image into Correct Image. 6. Changing Hair Color into Simply Fix Grey Hair. 7. Convert an Image into Blend Images using Layer Masking. 8. Create a 3D Text. 9. Create an Outline using a Brush Strokes. 10. Create a Photo Manipulation.
Total Contact Hours : 15

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIP KUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4N2			Title	Batch:	2022 - 2025
				Non Major Elective – II: Animation Lab	Semester:	IV
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To learn the concepts Multimedia and Compression Techniques through Graphic design.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect animation software and make them to design animated applications.	K1
CO2	Understand the gradients and patterns using available tools.	K2
CO3	Apply the concept of time line animation.	K3
CO4	Analyze innovative character and applying effects with aid of software.	K4
CO5	Evaluate import text, character, paragraph formatting and effects to text.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			H		M	M	H	H	H	M
CO2	M	M		M			M		M	H	M	H
CO3	L	H		H	H	M	M	M	H	H	H	H
CO4	M	H		M	H	H	M	M	H	M	M	M
CO5	M	M		M	M	M	M	M	M	M	H	M

1. Setting Motion for a Butterfly.

2. Create a Rain Effect.

3. Create a masking.

4. Create a Basket Ball.

5. Create a Text Animation.

6. Design a Cartoon Background.

7. Create a Water Effect.

8. Create a flash website.

9. Create a Lightening Effect for Text.

10. Create an Image Gallery using Buttons.

Total Contact Hours : 15

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIP KUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
CourseCode:	22UBC4VA			Title	Batch:	2022-2025
				VAC II : PC Assembly andMaintenance	Semester:	IV
Lecture Hrs./Week		Tutorial Hrs./Sem			Credits:	2*

Course Objective

This course will enable the students to understand the fundamentals of Computer and enabling them to assemble troubleshoot and installation of hardware, software & peripherals devices of Computer.

Course Outcomes (CO)

K1	CO1	To Demonstrate knowledge & Concepts of Computer Fundamentals.
K2	CO2	To know the Installation of Operating System and preventive maintenance.
K3	CO3	To know how to Perform a step by step assembly of a computer.

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		M		M		L	M	H	H	H
CO2	H	H	H	H	H	M	M	L	M	M	H	H
CO3	H	H		M	H	M	M	H	H	M	H	H

Units	Content	Hrs
Unit I	**Basics of computer**: I/O devices- Monitors- Hard Disk- Study of different types of Mother Board- Study of different Buses- I/O Ports- graphic cards- Installation of printer / modem /OS /scanner -Recovery & Trouble shooting.	10
	Introduction to BIOS/CMOS Setup: POST, Configuration, Booting Sequence/Boot Order. **Partitioning:** Partitioning of Hard Drive - Primary, Extended, Logical partitions using Partition Tools. **Installation of Drivers and Software**	
Unit II	**Components and Parts:** Identifying the Important Hardware Components of PC. i.e., CPU, Motherboard, RAM, HDD, ODD, SMPS, K/B, Mouse, Monitor etc **SMPS**: Types of SMPS- Power stored in UPS- Components and Circuits inside the SMPS Unit.	10
Unit III	**Installation of Operating System**: Win XP/Win 7-Activation and Automatic Updating procedures- Device Driver Installation **Installation of Application Software's**: Office Automation- DTP Software, Tools, Utilities etc. Uninstalling Applications / Software's. **Diagnostic and troubleshooting of PC:** POST- identifying problems by Beep codes errors, checking power supply using Multi-meter, Replacement of components etc. **Maintenance of PC.**	10
	Total Contact Hrs	**30**

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ben Hubbard Read and Learn: Our Digital Planet, Ben Hubbard	How Computers Work (Unit 1)	Heinemann read and learn Our Digital Planet Series, , , Raintree,	2018

2	Kevin Wilson	Essential Computer Hardware, The Illustrated Guide to Understanding Computer Hardware (Unit 2, 3)	Elluminet Press	2018

22UBC4VA

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIP KUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC515			Title	Batch:	2022-2025
				Core - XI : Python Programming	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem			Credits:	05

Course Objective

The course is designed to covers the Basic knowledge of Python Programming. It is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the fundamental concept of python programming.	K1
CO2	Understand the control flow, Operators and looping statements	K2
CO3	Applying and developing programs using Functions &modular programming.	K3
CO4	Analyze the Errors handling Mechanisms while working with Exception	K4
CO5	Evaluate object oriented features and organize files.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M		M	M	H			M	M	H	M
CO2	M	M		M	H	M	M		H	M	H	M
CO3	H	H	M		H	H			H	H	H	H
CO4	H	H	M	M		H	M		H	H	H	H
CO5	H	H				H	H		H	H	H	H

Units	Content	Hrs
Unit I	Introduction To Python - Uses Of Python – Python Basics: Identifiers & Keywords – Data Types – Operators – Built In Functions & Modules – Comments & Indentation – Classes & Objects.	15
Unit II	Control Statements: Control Flow And Syntax – Decision Making Statements – Repetition Control Statements – Break & Continue – Console Input/ Output – Lists – Tuple – Sets – Dictionaries.	15
Unit III	Functions: Communication With Functions – Types Of Arguments – Recursion – Lambda Functions – Higher Order Functions – Namespaces - Strings – Built-In Functions.	15
Unit IV	Classes And Objects: User Defined Classes – Object Initialization – Class Variables And Methods – Dir ( ) Functions – Operator Overloading – Containership – Inheritance – Types Of Inheritance – Polymorphism.	15
Unit V	Exception Handling: Types Of Errors – Try – Except Block – Else Block – Finally Block – File Input/output – I/O System – Read/Write Operations – File Opening Modes – File & Directory Operations – Command Line Arguments.	15
	Total Contact Hrs	**75**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Yashavant Kanetkar & Aditya Kanetkar	Let Us Python**:** 4th Edition (Unit 1 to 5)	BPB Publications	2022
2	Martin C**.**Brown	Python**:** The Complete Reference (Unit 1 to 5)	Mcgraw Hill Publications	2018

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Allen Downey, Jeffrey Elkner, Chris Meyers	Learning With Python	Green Tea Press,Wellesley, Massachusetts.	2016
2	Wesley J Chun	Core Python Application Programming.	Prentice Hall PressUpper Saddle River, NJ,USA	2012
3	Mark Lutz.	Learning Python	O'Reilly & Associates, Inc. Sebastopol	2003

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.UMAMAHESWARI.D Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC516			Title	Batch:	2022-2025
				CORE - XII : Software Testing	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	5

Course Objective

The course is to expose the students to different software testing tools and techniques, to plan and create test plan and manage test cases. To gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects using automation tool.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the fundamental concepts and types in software testing.	K1
CO2	Understand the process of applying tests to software and the basic components of a test case.	K2
CO3	Apply a test plan by learning its process and components.	K3
CO4	Analyze the automation techniques and use modern testing tools to support software testing projects.	K4
CO5	Evaluate the test code and automate test execution.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	H			M	H	H	M
CO2	H	H		M	H	H	M		H	H	H	H
CO3	H	H	M	M	H	H	H	M	H	H	H	H
CO4	M	M	M		M	M				H	M	M
CO5	H	H		M	H	H	H		H	H	H	H

Units	Content	Hrs
Unit I	Software-Software Characteristics-Software Components-Software Applications- The Process-Software Engineering a Layered Technology-The Process, Methods, Tools-A Generic View of Software Engineering- The Software Process- Software Process Models-Linear Sequential Models-Prototyping Model-RAD Model- Evolutionary Software Model-The Incremental Model-Spiral Model-Component Assembly Model-Concurrent Model.	15
Unit II	Analysis Modeling-Elements of Analysis Model-Data Modeling-Data Objects, Attributes and Relationship Diagram-Function Modeling-Data Flow Diagram- Behavioral Modeling. Design Concepts and Principles-The Design Process-Design Principles-Design Concepts-Abstraction, Refinement, Modularity, Software Architecture, Control Hierarchy, Structured Partitioning, Software Procedure, Information Hiding- Effective Modular Design-Functional Independence-Cohesion- Coupling-Design Documentation.	15
Unit III	Software Quality Assurance (SQA), Quality Control (QC), Comparison between QA & QC. Introduction to Testing, Black Box Testing: Equivalence Partitioning- Boundary Value Analysis-Error Guessing- White Box Testing: Statement Coverage-Decision Coverage-Path Coverage- Test Case- Levels of Testing: Unit Testing-Integration Testing- Sub System Testing-System Testing- Acceptance Testing. Software Testing Life Cycle-Special Types of Testing.	15
Unit IV	Test Plan- Phases of Test Plan-Hierarchy of Test Plan-Hierarchy of Test Document-Test Plan Process-Components of a Test Plan.-Verification and Validation- Audits-Reviews-Software Metrics- Process Metrics- Project Metrics-Product Metrics- Testing Metrics. Introduction to Automation Test Tools- Automation Process-Features of Automation Tools: Record and Playback- Integration- Environment Support- Database Test- Data Function- Object Mapping-Image Testing- Object Name-Map-Object Identity Tool-Test/Error Recover-Web Testing- Extensible Language- Mercury Interactive- Quality Standards	15
Unit V	Introduction-Selenium IDE-Web Driver-Launching AUT and Inspecting properties of Elements-Automating Operations on various Elements-Automating Keyboard and Mouse Events-Handling multiple Windows-Handling Alerts-Handling Frames-Page Object Model (POM)& Page Factory in Selenium-Database Testing using Selenium.	15
	Total Contact Hrs	**75**

The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THEBOOK	PUBLISHERS\ EDITION	YEAR OF PUBLICATION
1	Roger Pressman	Software Engineering (Unit 1,2)	A Practioner's Approach, Sixth Edition	2005
2	Course Material prepared by the Department of Computer Science based on the above web references (Unit 1 to 4).			
3	Mark Fewster& Dorothy Graham	Software Test Automation (Unit 5)	Addiso_Wesley	1999

Reference Books

S.NO	AUTHOR	TITLE OF THEBOOK	PUBLISHERS\ EDITION	YEAR OF PUBLICATION
1	Srinivasan Desikan & Gopalswamy Ramesh	Software Testing	Pearson Edition	2007

Course Designed by	HOD	CDC	COE
Name and Signature	**Name and Signature**	**Name and Signature**	**Name and Signature**
Name: Dr.T.SUMADHI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5E1			Title	Batch:	2022 - 2025
				Core Elective – I: Networks	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem.			Credits:	05

Course Objective

To provide a strong background of computer network concepts, a good foundation covering the layers of OSI and TCP/IP model to acquire knowledge and network functionalities into layers.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember computer network basics, network architecture, and TCP/IP and OSI reference models.	K1
CO2	Understand the knowledge about essential protocols and their operations.	K2
CO3	Apply aspects of network security.	K3
CO4	Familiarize the different types of protocols.	K4
CO5	Evaluate detection and correction of errors in transmission.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M		H	H	M	H		H	H	H	H
CO2	M	M	M	M	H		H		H		H	M
CO3	H	H	M	H	M	M	H		H	H	H	H
CO4	M	M		M	M			M	M		M	M
CO5	M	H	M	M	M	H	L		M	M	M	H

Units	Content	Hrs
Unit I	Introduction: Uses of Computer Network-**Network Hardware:** LAN – WAN – MAN – Wireless – Home Networks. **Network Software:** Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. **Reference Models:** OSI Reference Model – TCP/IP reference Model	18
Unit II	**Physical Layer -** Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission:** Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites:** Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites – Satellites versus Fiber. **Data-Link Layer:** Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols.	18
Unit III	**Network Layer:** Routing algorithms – Congestion Control Algorithms – IPv4 Addresses – IPv6 Addresses. **Transport Layer:***Elements of Transport Protocols* – Internet Transport Protocols: TCP – Quality of Service.	18
Unit IV	**Session Layer:** Session and Transport Interaction – Synchronization Points – Session Protocol Data Unit. **Presentation Layer:** Translation – Encryption/Decryption – Authentication – Data Compression.	18
Unit V	**Application Layer:** DNS – E-mail: SMTP, POP – File Transfer Protocol – HTTP – Telnet Protocols. **Case Studies:** Network Security.	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Andrew S. Tanenbaum	Computer Networks	4th edition (Unit -1, 2, 3, 5)	Reprint 2003, PHI.
2	BehrouzA.Forouzan	Data Communication And Networking	2nd Edition Update, Genuine Tata Mcgraw – Hill Edition. (Unit – 4)	2008

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Achyut Godbole	Data Communication And Networks	Tata McGraw Hill Edition	2007
2	Uyless Black	Computer Networks Protocols, Standards, and Interfaces	Prentice Hall India, 2nd Edition.	Jan. 1993

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: MR.S.DILIP KUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5E2			Title	Batch:	2022-2025
				Core Elective - I : Organizational Behaviour	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem			Credits:	05

Course Objective

This course aims in developing the knowledge in personality, perception, attitudes and motivation and learning about stress management, communication, leadership, organization structure and organization culture and helps to apply the obtained knowledge in their career development.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the Individual Behaviour and its effects in an organization.	K1
CO2	Acquire the knowledge about Personality, Perception, Attitudes and Values.	K2
CO3	Apply Learning and Motivation concepts in an Organization.	K3
CO4	Analyze the various types of Organizational Culture and Organizational Structure.	K4
CO5	Interpret the various types of leadership and the effects of adaptation to it.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1		H		L	M	M			M	M	M	M
CO2	M	H		M	H	H			H	L	H	H
CO3	M	H	M	H	H	H	M	M	H	M	H	H
CO4		H			H	H			M	M	H	H
CO5	L	M			H	H	M	M	H	M	H	H

Units	Content	Hrs
Unit I	Introduction: Elements of OB – Nature and Scope of OB - Contributing Disciplines to OB - Foundations of Individual Behaviour: Introduction – The Individual and Individual Differences – Human Behaviour and its Causation – Personality: Concepts – Determinants – Types.	18
Unit II	Perception: Perceptual Process – Factors affecting perception – Improving Perception – Impression management - Attitudes: Concept of Attitudes – Formation of Attitudes – Types of Attitudes - Values: Concept of Value – Types of Values – Formation of Values – Values and Behaviour - Job Satisfaction.	18
Unit III	Learning: Meaning and Definition – Determinants of Learning - Learning Principles – Reinforcement – Punishment – Learning and Behaviour - Motivation: Concepts – Meaning of Motivation – Nature of Motivation – Motivation Cycle or Process – Need for Motivation – Theories of Motivation – Group Behaviour.	18
Unit IV	Organizational Conflicts: Definition of Conflict – Sources of Conflict – Types of Conflicts – Aspects of Conflicts – Functional Conflict – Dysfunctional Conflict – Conflict Process – Conflict Management - *Job Frustration - Stress Management.*	18
Unit V	Communication: Nature and Need for Communication – Communication Process – Communication Channel – Communication Networks –Communication Barriers – Effective Communication - *Leadership – Organizational Culture: Types – Functions – Team Building.*	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

22UBC5E2

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	S.S Khanka	Organizational Behaviour (Unit 1 to 5)	S.Chand& Company Ltd	2002

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	John W Newstorm and Keith Davis	Organizational Behaviour	Tata McGraw Hill	2001
2	Hugh J Arnold and Daniel C Fieldman	Organizational Behaviour	Tata McGraw Hill	1996

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.UMAMAHESWARI.D Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5E3			Title	Batch:	2022-2025
				Core Elective –I : Data Science	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem			Credits:	05

Course Objective

To develop the student's knowledge in the basic concepts of Python, Machine Learning and Deep Learning.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the fundamentals of Python and R-Programming.	K1
CO2	Understand the basic concepts of Data Wrangling and the process of data flow.	K2
CO3	Apply the basic concepts in Natural Language Processing and Neural Networks.	K3
CO4	Analyze the concept of Machine Learning and Deep Learning.	K4
CO5	Evaluate ML Algorithms and gain knowledge on Outliers.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M				H	H					H	H
CO2					H	M		M	H	H	H	H
CO3		H	M			H	H	M	H	H	H	H
CO4				H	H	H	H		H	H	H	H
CO5	M	H		H	H	H				H	H	H

Units	Content	Hrs
Unit I	Python for Data Science: Why Python – IDEs for Python Programming – Packages – Top 10 DS Packages in Python – Modules in Python – Introduction to R – Commands – Objects – Variables – Data Visualization – Basic Graphs using R.	18
Unit II	Data Wrangling – Definition - Analytic Process – Cross Industry Standard for Data Mining – Sources of Data – The Data Science Process – Process Flow – The Data Scientist Role – Data Wrangling Steps.	18
Unit III	Natural Language Processing – Statistical Language Models – Unigram Model – Bigram Model – N-gram Models-–Logistic Regression – Neural Network – DNN - NTypes of Neural Network.	18
Unit IV	Machine Learning – What is Machine Learning? – Components of Machine Learning – Types – ML Algorithms – Comparison of K-Means and DB Scan - Deep Learning – What is Deep Learning? – Applications of Deep Learning.	18
Unit V	Data Preprocessing – Why Data Preprocessing? – Data Transformations – Identifying and Handling the missing values - Encoding the Categorical Data – Ways to Encode- Normalization vs Standardization- - *Case studies on Machine Learning Algorithms* – Outliers.	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Jurafsky and Martin	Speech and Language Processing (Unit 1 to 5)	Prentice Hall, 2nd Edition	2008

Reference Websites

S.NO	WEBSITES
1	https://towardsdatascience.com/data-preprocessing-concepts-fa946d11c825
2	https://developers.google.com/machine-learning/clustering/clustering-algorithms
3	https://towardsdatascience.com/your-guide-to-natural-language-processing-nlp-48ea2511f6e1
4	https://www.ibm.com/cloud/learn/natural-language-processing

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: MR.D.POOBATHY Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC517			Title	Batch:	2022-2025
					Semester:	VI
Practical Hrs./Week	5	Tutorial Hrs./Sem.		Core Lab - VII : Python Programming	Credits:	02

Course Objective

The course presents an overview of elementary data items, list, dictionaries and oops concepts.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the syntax of the Python language	K1
CO2	Understanding the control statements, loops and functions	K2
CO3	Identify the external modules for creating and writing data to excel files and inspect the file Operations to navigate the file systems.	K3
CO4	Analyze the techniques used to design and create Python.	K4
CO5	Interpret the concepts of Object-oriented programming as used in Python using encapsulation, polymorphism and inheritance	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H	M		M	M					M	H
CO2	H	H	M	H	M	M	M	M	H	H	M	H
CO3	H	H			M	M		H	H	H	H	H
CO4	H	H	M	M						M	M	H
CO5	H	H		H	M	M		H	H		H	H

1. Write a program to display the following information: Your name, Full address, Mobile number, College name, Course.
2. Write a program to find the largest integer using if-else and comparison operator.
3. Write a program to find the Armstrong number.
4. Write a program to display prime number.
5. Write a program to generate the Fibonacci series
6. Write a program to display the Student Marksheet.
7. Write a program to find the factorial of a given number.
8. Write a program to generate the product of matrices.
9. Write a program to design a simple calculator.
10. Write a program to find the mean, median and mode.
11. Write a program to convert Decimal to Binary, Octal and Hexadecimal.
12. Write a program to Generate random number from the list.
13. Write a program to handle the Exceptions.
14. Write a program to create two files and merge them.
15. Write a program to find out the uppercase and lowercase characters in the file and count the words present in the file.

Total Contact Hours : 60

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.UMAMAHESWARI.D Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC518			Title	Batch:	2022-2025
				Core Lab - VIII : Software Testing	Semester:	V
Practical Hrs./Week	5	Tutorial Hrs./Sem			Credits:	02

Course Objective

The course has been designed to provide knowledge on how to planning a test project, designtest cases and data, conduct testing operations, manage software problems and defects, and generate a testing report.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Recollect the essential characteristics of tools used for test automation.	K1
CO2	Understands the Automation testing approach and to write test suites for software	K2
CO3	Develop analyzing techniques through automation testing tool	K3
CO4	Generate test cases from software requirements using various test processes for continuous quality improvement	K4
CO5	Evaluate the automation process in software testing.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1		H	M	M	H	H	H	H	M	H	H	H
CO2	H	M			H	M		H	H	H	M	H
CO3		H	M	M	H	H		H	H	H	H	H
CO4	H	H	M	M	M	M	M	H	M	M	H	H
CO5	M	M	M	M	H	H	H	M	H	M	M	M

22UBC522

1. Write a test case based on controls.
2. Using Selenium IDE, Write a test suite containing minimum 4 test cases.
3. Using Selenium write a simple test script to validate each field of the registration page
4. Conduct a test suite for any two web sites.
5. Write and test a program to login a specific web page.
6. Write and test a program to count number of items present on a desktop.
7. Write and test a program to get the number of list items in a list / combo box.
8. Write and test a program to provide total number of objects present / available on the page.
9. Test a program in MS Excel for Data Driven Wizard.
10. Test the addition of two values in C++ Program
11. Test a HTML file

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.N.DIVYA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC519			Title	Batch:	2022 -2025
				Mini Project	Semester:	V
Lecture Hrs./ Week or Practical Hrs./Week		Tutorial Hrs./Sem.			Credits:	2

BACHELOR OF COMPUTER APPLICATIONS
PROJECT and VIVAVOCE

Guidelines

Introduction

The title of the project work and the organization will be finalized at the end of fifth Semester. Each student will be assigned with a Faculty for guidance. The Project work and coding will be carried by using the facility of computer science lab as well as in the organization. Periodical review will be conducted to monitor the progress of the project work. Project report will be prepared and submitted at the end of the semester. External examiner appointed by the Controller of Examination will conduct the viva voce examination along with respective guide.

Area of Work

- Web Based Development
- Mobile app development
- Website development
- IOT Projects
- Big Data and Data Mining Projects
- Cloud Computing Projects
- Networking Projects
- Artificial Intelligence and Machine learning Projects
- Data Analytics Projects using Python, R, Tableau etc..
- System Software
- Web Security Projects
- Image Processing

Methodology

Arrangement of Contents:

The sequence in which the project report material should be arranged and bound as follows:

1. Cover Page & Title Page
2. Bonafide Certificates from Organization(Mandatory)
3. Declaration
4. Acknowledgement
5. Synopsis
6. Table of Contents.
7. Chapters
8. Appendix
9. Reference

Format of Table of Contents

TABLE OF CONTENTS

Chapter No. **Title** **PageNo.**

Hardware Specification

Software Specification

2 System Study

Existing System

Drawbacks

Proposed System

Planning and Scheduling

3 System Design

Overview of the Project

Modules of the Project

Input Design Format

Output Design

Table Design

Supporting Diagrams (ER/ DFD/ Use Case)

4 Implementation and Testing

Coding Methods

Testing Approach

Implementation and Maintenance

5 Project Evaluation

Project Outcome

Limitation of the Project

Further Scope of the Project

6 Conclusion

7 Appendix

Source Code

Screenshots and Reports

8 References

Size of the Project

The Project Report contents should be maximum of not exceeding 60 pages

Assessment Method

Internal Assessment: 50 Marks

Criterion	Mode of Evaluation	Marks	Total
I	Synopsis, Company profile, System Specification, Existing system, Proposed system OR (For android Developments)Planning Stage	15	50
II	Supporting Diagrams like system flowchart, ER, DFD, Use case and Table Design OR UI and UX Design Application Architect and Prototyping	20	
III	Coding, Input forms, Output format, testing OR Development, Testing Preparation of rough draft	15	

External Assessment: 50 Marks

Mode of Evaluation	Marks	Total
Project Report		
Title Relevance of the Industry/ Institute	05	40
Technology	05	
Design and development Publishing	15	
Testing, Report	15	
Viva Voce		
Project Presentation	05	10
Q & A Performance	05	

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5S1			Title	Batch:	2022-2025
					Semester:	V
Lecture Hrs./Week	3	Tutorial Hrs./Sem		Skill Based Elective - III : Mobile Phone Services	Credits:	02

Course Objective

The course has been designed to provide knowledge on Mobile Repair configuration, assembly, testing and Maintenance.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Remember the basics of mobile communication, parts inside a mobile phone.	K1
CO2	Understand the application and software compatibility with the Mobile Phone technologies.	K2
CO3	Apply appropriate tools and manuals for repairing the specific issues.	K3
CO4	Analyze Repair and Diagnose Problem of all kinds of faults in Mobile Phone in Hardware as well Software.	K4
CO5	Explain about Fault finding, troubleshooting and repairing of various faults.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H		M		M		L	M		H	H
CO2		M				M	M	L	M	M	H	H
CO3	H	H		M	H	M	M	H	H	M	M	M
CO4		M			M	M			H	H	H	H
CO5	H			H		H			M		H	H

Units	Content	Hrs
Unit I	**Basics of mobile communication** - Scope and Opportunities for Mobile Repairing business - Identify business opportunities - Types of Mobile Phones and Technologies - Latest Trends.	9
Unit II	**Mobile phone parts** – Motherboard - Integrated Circuit - BGA and SMD chips – Screen - Microphone – Sensors - Cables.	9
Unit III	**Mobile repair Equipments** - Handling - DC Power Supply - Multimeter - soldering iron - Battery Booster - PCB Holder - Microscope.	9
Unit IV	**Hardware Repair - Repairing** procedure – Cleaning - Assembling & disassembling - Change of different ICs - Soldering & DE soldering procedures.	9
Unit V	**Software Repair -** Flashing - Driver Software - Mobile Software - Software Installation methods - Fault finding & Troubleshooting – Mobile Bricking - Antivirus Installation.	9
	Total Contact Hrs	**45**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Assignment, Case Study

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Sanjib Pandit	Advance Mobile Repairing: Multicolour Circuits, Service Diagrams & Repairing (Unit 1 to 5)	BPB Publications	2010

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	S.K. Gupta	Mobile Repairing Jumper Book All In One	GT Publications	2016

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.N.DIVYA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5S2			Title	Batch:	2022 – 2025
				Skill Based Elective - III :Internet Of Things	Semester:	V
Lecture Hrs./Week	3	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To understand the fundamentals of Internet of Things and its protocols. They also understand how to acquire sensor data, make available on the Internet and visualize sensor data and will be able to build simple low-cost embedded systems using Raspberry Pi to apply the concept of IOT in the real-world applications.

Course Outcomes

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

CO Number	Co Statement	Knowledge Level
CO1	Learn the concept and significance of IOT and its services.	K1
CO2	Understand the different IOT Technologies like Micro-Controller, Wireless communication like Blue Tooth, GPRS, Wi-Fi and Storage and embedded systems.	K2
CO3	Deploy and test different protocols and prototypes in IOT.	K3
CO4	To create programs using Arduino IDE and extract data	K4
CO5	Experiment IOT systems and test its connection to the cloud computing, big data and machine learning disciplines.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	M		L		M	M	M
CO2	M	H	H	M	H	H	H		H	M	H	M
CO3	M	M	M	H		H	H		H	M	H	H
CO4		M	H		H	H		M	H	H	H	H

CO5	M	M	H	H	H	H	H	M	H	H	H	H

Units	Content	Hrs
Unit I	Introduction to IOT: Internet of Things – Physical Design – Logical Design – IOT Enabling Technologies – IOT Levels & Deployment Templates – Domain Specific IOTs.	9
Unit II	IOT Architecture: M2M high-level ETSI Architecture – IETF Architecture for IOT. IOT Platform Design Methodology: Introduction-Design Methodology-IOTSystem Management.	9
Unit III	IOT Reference model – Domain model - Information model - functional model –Communication model - IOT Reference Architecture - IOT Protocols.	9
Unit IV	Working with Arduino: LED and Switch - Data acquisition with IOT Devices - Understanding Sensors and Devices - Understanding the Inputs from Sensors - Working with Temperature Sensors -Working with Ultrasound Sensor -Working with humidity sensor - Working with Motion Sensor.	9
Unit V	Case studies: IOT Design-Home Automation, Cities, Environment, Agriculture, Productivity Applications.	9
	Total Contact Hrs	**45**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Assignment, Case Study

Text Book

22UBC5S2

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Arshdeep Bahga , Vijay Madisetti	Internet of Things: A hands-on Approach (Unit 1 to 5)	Universities Press	2015

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Dieter Uckelmann, Mark Harrison, Michahelles,Florian	Architecting the Internet of Things	Springer	2011
2	Honbo Zhou	The Internet of Things in the cloud: A Middleware Perspective	CRC Press	2012
3	Olivier Hersent, David Boswarthick, Omar Elloumi	The Internet of things – Key applications and Protocols	Wiley	2012

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.A. MURUGANANDHAM Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5AL			Title	Batch:	2022-2025
				Advanced Learner Course – I: Adhoc And Sensor Networks - Self Study	Semester:	V
Lecture Hrs./Week		Tutorial Hrs./Sem			Credits:	05*

Course Objective

To study the protocols and the functionalities of ad hoc networks, understanding the various applications developed based on ad hoc networking, addressing issues and challenges created. To know about the sensor networks and addressing the challenges in establishing infrastructure for sensor networks and managing database.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Understand the Fundamental Concepts and applications of ad hoc and wireless sensor networks	K1
CO2	Demonstrate the MAC protocol issues of ad hoc networks	K2
CO3	Apply the concepts of network architecture and MAC layer protocol for WSN	K3
CO4	Analyze the routing protocols for ad hoc wireless networks with respect to TCP design issues	K4
CO5	Explain the WSN routing issues by considering QS measurements	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		H	H	H	H	H		H	H	H
CO2				M		M		H			M	M

CO3	H	H		H	H	H	H	M	H	H	H	H
CO4				M			M	H	M	H	H	H
CO5	M			M	H	H	M				M	M

Units	Content	Hrs
Unit I	Introduction to adhoc & sensor networks: Key definitions of adhocand sensor networks- unique constraints and challenges- advantages of ad-hoc/sensor network- driving applications- issues in adhoc wireless networks- issues in design of sensor network- sensor network architecture- data dissemination and Gathering.	15
Unit II	Issues in designing MAC protocols for adhoc wireless networks- Design Goals of MAC protocol for Ad hoc Networks - Classification of MAC protocols - MAC protocols for sensor network- Contention Based Protocols - Reservation and Scheduling Mechanisms - Other Protocols.	15
Unit III	Routing protocols for Ad hoc wireless Networks- Design Issues and Classifications of uncast and multicast Routing Protocols - Proactive- Reactive and Hybrid routing protocol – Tree based and Mesh based multicast protocols- Energy Efficient and QoS guaranteed multicast protocols.	15
Unit IV	Security in wireless Ad hoc wireless Networks-Network security requirements-challenges in security provisioning-Network security attacks- Layer wise attacks in wireless sensor networks: jamming- tampering- black hole attack- flooding attack- Secure routing in Ad hoc wireless Networks.	15
Unit V	Quality of service in Ad hoc wireless Networks: Introduction-challenges in providing QoS in Ad hoc wireless Networks- Classification of QoS solutions-MAC layer solutions-network layer solutions.	15
	Total Contact Hrs	**75**

The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Assignment, Case Study

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	C. Siva Ram Murthy and B.S. Manoj	Ad Hoc Wireless Networks – Architectures and Protocols(Unit 1 to 3)	Pearson Education- 2nd Edition	2005
2	Feng Zhao and Leonidas Guibas	Wireless Sensor Networks – An Information Processing Approach (Unit 4, 5)	Elsevier Publications	2004

Reference Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	C.K.Toh	Ad hoc Mobile Wireless Networks – Protocols and Systems	Pearson Education- 1st Edition	2007.
2	George Aggelou	Mobile Ad hoc Networks – From Wireless LANs to 4G Networks	Tata McGraw Hill	2009
3	Holger Karl and Andreas Willing	Professional ASP .NET Protocols and Architectures for Wireless Sensor Networks 1.1	Wiley Publications	2005

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.N.DIVYA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC620			Title	Batch:	2022 - 2025
				Core XI: PHP Programming	Semester:	VI
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	03

Course Objective

To learn concepts relating to PHP and its scripting including functions, form handling and database management. This course also covers MySQL as a backend database system includes table creation and data backups. It helps to create effective and dynamic websites.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the concept of PHP and its syntax and scripts.	K1
CO2	Understand frameworks, functions and objects to implement dynamic websites.	K2
CO3	Apply dynamic, client server programming and database management concepts to generate complex queries.	K3
CO4	Analyze various database queries to learn how to combine PHP and My SQL to experiment web pages by integrating forms and other features.	K4
CO5	Evaluate security, scripting features provided by the PHP to maintain high level of data protection.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	M	H	M	L			M	M	H
CO2	H	H	M		M		M	M	H	M	M	M

CO3	M	H	M	H	H	M	H		H	H	H	H
CO4	H		H		M	M	M	H	M	M	H	M
CO5	H	M		M	H	H	H	L	M	H	H	H

Units	Content	Hrs
Unit I	Introduction to Dynamic Web Content: Request / Response Procedure - Benefits of PHP and My SQL - The Apache Web Server - XAMPP: Installing XAMPP onWindows - Working remotely - Using an IDE. Introduction to PHP: Structure of PHP - Expressions and Control Flow in PHP.	15
Unit II	PHP Functions - Defining a function - returning a value - returning an array - returning global variables - Including and requiring Files. PHP Objects: Declaring a class - creating an object - accessing objects - Inheritance - PHP Arrays - Practical PHP: printf - Date and Time functions- file handling.	15
Unit III	Introduction to MySQL: Basics - Databases- Accessing via Command line. Accessing MySQL using PHP: Querying - Creating a Table - Dropping a Table - Adding Data - Retrieving Data - Updating Data - Deleting data.	15
Unit IV	Mastering MySQL: Database Design - Transactions - Using EXPLAIN - Backing up and restoring - *Preventing Hacking attempts.*	15
Unit V	Form Handling: Building forms - Retrieving submitted data - Default values - Input types- HTML5 - Cookies: setting, accessing and destroying a cookie - HTTP authentication - sessions.	15
	Total Contact Hrs	**75**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Assignment, Case Study

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Robin Nixon	Learning PHP, MySQL & JavaScript (Unit 1 to 5)	Shroff Publishers, Fourth Edition	2014 (Unit 1 to 5)

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Dennis Popel	Learning PHP Data Objects: A Beginner's Guide to PHP Data Objects	Packt Publishing	2009
2	Max Bramer	Web Programming with PHP and MySQL: A Practical Guide	Springer International Publishing	2015

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr. D. POOBATHY Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC621			Title	Batch:	2022-2025
				Core - XII : Mobile Application Development	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem			Credits:	03

Course Objective

To provide a practical approach for Android mobile application development and theoretical knowledge about windows application.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the history of Android development and what is required to build Android apps.	K1
CO2	Understanding Android application architecture, including the roles of the task stack, activities, and services.	K2
CO3	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.	K3
CO4	Analyze the implementation of messaging and location-based services.	K4
CO5	Evaluate developed app and publish in market.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M		M	H			H	H	H	M	M
CO2	H	H			H	M	H	H		H	H	M
CO3	H	M			M		M	H		H	H	H
CO4	M	M		H	H	M	M	H		M	M	H
CO5	M	M	M	M	H		M	M	M	H	H	M

Units	Content	Hrs
Unit I	**Android and its Tools:** Introduction to Android-open Handset Aliance-Android Eco-System-Need of Android-Features of Android-Tools and Software Required for development of Android Application-Android Architecture. **Installation and Configuration of Android:** Operating System-Java SDk, Android SDK-Android Development Tools(ADT)-Android Virtual Devices(AVDs)-Emulators-Dalvik Virtual Machine-Difference Between JVM and DVM-Steps to Install and Configure Android studio and SDK.	15
Unit II	**Designing User-Interface with View:** Text View-Edit Text-Button-Image Button-Toggle Button-Radio button and Radio Group-Checkbox-Progress bar. List View-Grid View-Image View-Scroll View-Custom Toast Alert-Time and Date Picker.	15
Unit III	**UI Components and Layout:** Control flow-Directory structure-Components of a screen-Fundamental UI Design. Linear Layout-Absolute Layout-Frame Layout-Table Layout-Relative Layout.	15
Unit IV	**Activity:** Intent-Filter-Active Lifecycle-Broadcast Lifecycle-Content Provider-Fragments. **Services:** Features of service-Android platform service-Defining new service-Service Lifecycle-Android System Architecture.	15
Unit V	**Databases:** SQLite Database-Necessity of SQLite-Creation and Connection of the database-extracting value from Cursors-Transactions. Publishing Apps-Building APK-Google Play store	15
	Total Contact Hrs	**75**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group

22UBC625

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Dixit, Prasanna Kumar	Android (Unit 1)	Vikas Publications, NewDelhi, ISBN: 9789325977884	2014
2	Maclean David, Komatineni Satya, Allen Grant	Pro Android 5 (Unit 2, 3)	Apress Publications, ISBN: 978-1-4302-4680-0	2015
3	Hortan, John	Android Programming for Beginners (Unit 4,5)	Packet Publication, ISBN: 978-1-78588-326-2	2015

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Wei-Meng Lee	Beginning ANDROID 4 Application Development	Wiley Publications	2015 Edition

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIPKUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MANICKACHEZHIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E4			Title	Batch:	2022-2025
				Core Elective II: Storage Management	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.			Credits:	05

Course Objective

The main objective of the course is to understand the fundamental storage system architectures and storage performance management.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remembering the storage architectures, storage subsystems and variety of storage system environments.	K1
CO2	Understanding different RAID levels and their suitability on different Application environments.	K2
CO3	Apply the file sharing operations and protocols on Network Attached Storage (NAS).	K3
CO4	Analyze the characteristics and components of SAN	K4
CO5	Evaluate the different backup and recovery topologies	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M	L	L	M	M	H	L	M		H	M
CO2	H	M	M	H	M	H	M	M		M	H	H
CO3	M	M	M	L	H	L	L	M	M		H	M
CO4	H	M	M	M	H	M	M	H	M	H	H	H
CO5	H	M	L	M	H	H	H	L	M	H	H	H

Units	Content	Hrs
Unit I	Introduction to Information Storage and Management: Information Storage: Data – Type of Data - Information - Storage – Evolution of Storage Technology and Architecture - Data Center Infrastructure – Core Element - Key Requirement for Data Center Elements - Key Challenges in Managing Information Lifecycle: Information Life Cycle Management.	18
Unit II	Storage System Environment and RA/D: Components of Storage System Environment: Host - Connectivity- Storage Disk Drive Components - Platter, Spindle, Read/Write Head, Actuator Arm Assembly, Controller, Physical Disk Structure, Zoned Bit Recording, Logical Block Addressing - Data Protection: RA/D: Implementation of RA/D Software RA/D - Hardware RA/D-RA/D.	18
Unit III	Intelligent Storage System and Storage Area Network: Components Of An Intelligent Storage System: Front End - Cache – Back End - High End Storage Systems - Midrange Storage System - Storage Area Network: Fibre Channel: Overview - The SAN and its Evolution - Components of SAN - SAN Management Software - Fibre Channel Architecture.	18
Unit IV	Network Attached Storage and Content Addressed Scheme: Network Attached Storage: General Purpose Servers Vs NAS Devices - Benefits of NAS - Content Addressed Storage: Fixed Contents and Archives - Types of Archives - Features and Benefits of CAS.	18
Unit V	Storage Virtualization, Backup and Recovery: Forms of Virtualization: Memory Virtualization - Network Virtualization – Server Virtualization - Storage Virtualization- - Backup And Recovery: Backup Process - Disaster Recovery - Operational Back Up - Backup And Restore Operations - Virtual Tape Library.	18

	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	G. Somasundaram and AlokShrivatsava,	"Information Storage Management: Storing, Managing and Protecting Digital Information", (Unit 1 to 5).	Wiley,	2009

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ulf Troppens et al	Storage Networks Explained: Basics and Application of Fibre Channel SAN	NAS, ISCSI, INFINIB and FOCE", Wiley	2015
2	Hubbert Smith	Data Center Storage: Cost-effective strategies, implementation and management	CRC Press	2011

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.S.NIRAIMATHI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E5			Title	Batch:	2022-2025
				Core Elective II : Current Trends and Technologies	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.			Credits:	05

Course Objective

The main objective of the course is to study and apply IT applications with a wide range of concepts and technical skills in the areas to succeed in the future.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the latest trends in technology	K1
CO2	Understand the Objectives and Guidance of Cyber security.	K2
CO3	Apply the knowledge of big data and its analytical technologies	K3
CO4	Analyze the concepts Cyber Security Policy and Security Evolution.	K4
CO5	Implement the Data and Knowledge Management and use of Devices in IOT Technology.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H	L	M	H	M	M	L	H	M	H	M
CO2	M	H	M	M	H	H	M	L	H	M	H	H
CO3	H	H	L	H	H	H	H	M	H	L	H	H
CO4	M	H	M	H	H	H	H	L	H	H	H	H
CO5	H	H	M	H	H	H	H	M	H	H	H	H

Units	Content	Hrs
Unit I	Introduction - Putting the Internet of Things forward to the Next Level - Internet of Things Strategic Research and Innovation Agenda: Internet of Things Vision - Internet of Things Strategic Research and Innovation Directions - IoT Smart X Applications.	18
Unit II	Introduction SAP: Definition – SCM Applications component with some definitions – SAP SCM-APO – SCM processes – Activities – Objectives. Technical overview and System Architecture: Business Application components – Middleware – Multi-tier computing architecture – SAP kernel architecture.	18
Unit III	Fundamentals of Big Data: Evolution of Data Management-Managing the data – Big Data – Big data management architecture. Big Data Types: Structured data – Unstructured Data –Real Time and Non- real time requirements – Big Data together. Distributed Computing: History of Distributed Computing – *Basics of Distributing Computing* – Performance.	18
Unit IV	Introduction to Machine Learning: Introduction – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search- Finding a Maximally Specific Hypothesis – Version Spaces and the Candidate Elimination Algorithm – Linear Discriminants – Perception – Linear Reparability – Linear Regression	18
Unit V	Block chain :Introduction: Define block chain- structure and operational aspects of Bit coin block chain, - compare different types of block chains-The concept of asymmetric key encryption- the concept of hashing- techniques that use algorithms to manage the integrity of transactions and blocks in block chain.	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

TEXT BOOK

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS\ EDITION	YEAR OF PUBLICATION
1	Ovidiu Vermesan andPeter Friess	. Internet of Things - From Research Innovation to Market Deployment (Unit 1)	River Publishers,	2014. (Unit 1)
2	Agrawal	Programming in Sap Apo (Unit2)	Mcgraw Hill Edition	(unit 2)
3	. Judith Hurwitz, Alan Nurgent, Dr. Fern Halper, Marcia Kaufman,	" Big Data for Dummies" (Unit 3)	First Edition,A Wiley Publication	(2013) (Unit 3).
4	EthemAlpaydin	Introductionto Machine Learning 3e(AdaptiveComputationand Machine Learning Series) (Unit 4)	ThirdEdition, MIT Press	2014(Unit 4).
5	Manav Gupta	"Block Chain" (Unit 5)	2nd IBM Limited Edition	2018 (Unit 5)

REFERENCES BOOK

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Adrian McEwen and Hakim Cassimally, John Wiley and Sons,	Designing the Internet of Things by Adrian McEwen	Ltd	2014.

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.S.NIRAIMATHI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E6			Title	Batch:	2022-2025
					Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.		Core Elective II : Information Security	Credits:	05

Course Objective

To prepare students with the technical knowledge and skills needed to protect and defend computer systems and networks. To develop graduates that can plan, implement, and monitor cyber security mechanisms to help ensure the protection of information technology assets. To develop graduates that can identify, analyze, and remediate computer security breaches.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the fundamental concepts of Information Security.	K1
CO2	Understand the concepts of public key encryption, Authentication and hash functions.	K2
CO3	Examine the issues in Network Security and Intrusion Detection and Defensive Programming.	K3
CO4	Analyze the basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.	K4
CO5	Evaluate the security features and Cyber security law in real life situations.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	M	H	H	M		L		M	L	H	H
CO2	M	M	M	H	H	H	M		M	M	H	H
CO3			H		H	M	H		H	H	M	M
CO4		H	M	M	M	H	M	H	M	M	M	H
CO5	H	H	H	H	M	M	H	H		H	H	H

Units	Content	Hrs
Unit I	Attacks on Computers and Computer Security: Introduction – Need For Security – Types Of Attacks. Cryptography - Concepts and Techniques: Introduction – Plain Text and Cipher Text – Substitution Techniques - Transposition Techniques – Encryption and Decryption.	18
Unit II	Symmetric Key Algorithms: Introduction – Algorithm Types – An Overview Of Symmetric Key Cryptography – Data Encryption Standard (DES): How DES Works? Asymmetric Key Algorithms, Digital Signature and RSA: Introduction – An Overview Of Asymmetric Cryptography - The RSA Algorithm.	18
Unit III	Network Security: Intruders – Intrusion Detection – Password Management – Malicious Software – Viruses and Related Threats – Countermeasures – Distributed Denial of Service Attacks – Firewalls – Design Principles – Trusted Systems.	18
Unit IV	Software Security: Secure software engineering – Hackers, Crackers, and Attackers – Security Failures – Technical Trends affecting Software Security - *Defensive programming and its Techniques- Buffer overruns and other Implementation flaws.*	18
Unit V	Cyber security: Classification of Cybercrimes - Case Studies: Privacy - Mobile code– Security and the Law - The legal perspective – Indian perspective, Global perspective - *Cyber Stalking and Obscenity in Internet – Electronic Voting.*	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Atul Kahate	"Cryptography and Network Security", 2nd Edition (Unit-1 and 2)	Tata Mcgraw Hill Publications	2013
2	Debby Russell and Sr.G.T.Gangemi	Computer SecurityBasics (Unit – 1)	O'Reilly Media	2006
3	William Stallings	Cryptography andNetwork Security (Unit – 2, 3 and 4)	Prentice Hall	2008
4	Nina Godbole, SunitBelapure	Cyber Security – Understanding Cyber Crimes, Computer Forensics and Legal Perspectives (Unit-5)	Wiely India Pvt Ltd	2011

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Charles P pfleeger andShai Lawrence pfleeger	Security in Computing	Prentice Hall	2007
2	Behrouz A. Forouzan	Cryptography and Network Security	Tata Mc-GrawHill Publications	2007

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.B.AZHAGUSUNDARI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E7			Title	Batch:	2022 - 2025
				Core Elective - III : Data Mining And Warehousing	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.			Credits:	05

Course Objective

To learn the basic concepts, applications and techniques of data mining and to develop skills for applying data mining techniques and algorithms to solve practical problems in data and information management, retrieval and knowledge discovery in various disciplines.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the concept of data mining, warehousing and knowledge discovery process.	K1
CO2	Understand data pre-processing techniques like cleaning, integration and data transformation strategies.	K2
CO3	Describe the knowledge discovery process and its algorithms including k-nearest neighbour, decision trees, association rules and neural networks.	K3
CO4	Analyze the data modeling, design and implementation of warehousing solutions for emerging internet and cloud environments.	K4
CO5	Evaluate KDD environment by visualizing the reports using various analysis and query tools.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	L	L	H	M	L	M	H	M	H	H
CO2	M	H	L	L	M	H	H	L	H	L	M	M

CO3	H	M	H	L	H	H	L	L	M	M	H	M
CO4	M	L	H	H	M	M	H	L	H	M	H	H
CO5	M	H	L	L	M	H	L	M	M	M	M	H

Units	**Content**	**Hrs**
Unit I	Introduction to Data Mining: Definition- Kinds of Data- Kinds of Patterns - Technologies used – Major Issues in Data mining – Data mining Applications & Trends – Data objects & Attribute types – Data visualization.	18
Unit II	Data Preprocessing: Data cleaning: Missing values, Noisy data, Data cleaning as a process-Data Integration: Entity Identification problem, Redundancy and correlation analysis, Tuple Duplication, Data value conflict detection & resolution – Overview of Data reduction strategies – Data transformation strategies overview.	18
Unit III	Knowledge Discovery Process: Data Selection-Cleaning-Enrichment-Coding-Data Mining-Preliminary Analysis of Data Set Using Relational Query Tools-Visualization Techniques-Likelihood and Distance-OLAP Tools-K-Nearest Neighbour-Decision Trees-Association Rules-Neural Networks-Genetic Algorithms-Reporting.	18
Unit IV	Setting up KDD Environment: Introduction - Different forms of Knowledge - Getting Started - Data Selection – Cleaning - Enrichment – Coding - Reporting - 10 Golden Rules.	18
Unit V	Data warehousing: Basic concepts – Modeling – Design and usage – Data warehouse Implementation – Data generalized by Attribute – Oriented Induction.	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Jiawei Han, MichelineKamber, Jianpei	Data mining concepts and Techniques (Unit 1,2 & 5)	Morgan Kaufmann Publishers, 3rd edition	2011
2	Pieter Adriaans DolfZantinge	Data Mining (Unit 3 & 4)	Addison Wesley Publications, Second Edition	2000

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ian H. Witten Edile Frank	Data Mining- Practical Machine Learning Tools & Techniques	Elsevier Second Edition	2005
2	Daniel T. Larose	Data Mining Methods and Models	John Weiley& Sons	2006
3	ArunK.Pujari	Data Mining Techniques	Universities Press Third Edition	2013

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.B.AZHAGUSUNDARI Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E8			Title	Batch:	2022 - 2025
				Core Elective-III: Cloud Computing	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	05

Course Objective

This course provides with the basics of Cloud Computing, the key concepts of Virtualization and different Cloud Computing services. It also offers students a sound foundation of the Cloud environment so that they are able to start using and adopting Cloud services in their real life scenarios.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.	K1
CO2	Demonstrate the fundamental concepts of cloud storage and their use in storage systems such as Amazon S3 (Simple Storage Service) and Microsoft Azure.	K2
CO3	Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost.	K3
CO4	Analyze the performance of Cloud Computing.	K4
CO5	Explain the core issues of Cloud Computing such as security, privacy, and interoperability.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1		H		H	M	H	H		H		H	H
CO2		H		H	M	H	H		H		H	H
CO3		M		H	M	H	H		H		H	H
CO4		H		H	H	H	H		H		H	H
CO5		M		H	M	M	M		H		H	H

Units	Content	Hrs
Unit I	Cloud Computing Basics: Cloud Computing Overview-Cloud Components-Infrastructure-Services-Applications-Storage-Database Services-Intranets and the cloud-Components – Hypervisor Applications. First Movers in the Cloud: Amazon- Google-Microsoft.	18
Unit II	Organization and Cloud Computing-Benefits-Limitations of Cloud Computing-Security Concerns-Privacy concerns with a third party-Security Benefits.	18
Unit III	Cloud Computing Technology: Hardware and Infrastructure-Clients-Security-Network-Services-Accessing the cloud-Platforms-Web APIs-Web Browsers-Cloud Storage-Overview-*Cloud Storage Providers*-Standards	18
Unit IV	Cloud Computing with the Titans: Google-Google App Engine-Google Web tool kit-EMC Technologies-VMware Acquisition-Microsoft-Azure Services Platform-Windows live-Exchange online-Sharepoint Services-Microsoft Dynamics CRM-Amazon-Amazon Elastic Compute Cloud-Amazon Simple Storage Service-Amazon Simple Queue Service -Salesforce.com-IBM.	18
Unit V	Security Concerns in Cloud Computing-Key Areas of Cloud Security-*Threats and Vulnerabilities in Cloud Computing*-How to overcome Cloud Security Challenges and Solutions. *Case Studies: Research Topics in the field of Cloud Computing*	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Anthony T.Velte, Toby J.Velte, Robert Elsenpeter	Cloud Computing-A Practical Approach (Unit 1 to 5)	McGraw Hill Publications	2010

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Dr. Kumar Saurabh	Cloud Computing	Wiley India,Second Edition	2012

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr.S.HEMALATHA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E9			Title	Batch:	2022-2025
				Core Elective - III : Nano Computing	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem			Credits:	05

Course Objective

This course is intended to provide the students with the prospects, challenges, imperfections, reliability and with insight into Nanoscale Quantum Computing and QCA implementation.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Remember the concepts of Nano computing	K1
CO2	Understand Nano computing challenges and imperfections	K2
CO3	Apply reliability evaluation strategies	K3
CO4	Analyze nano scale quantum computing	K4
CO5	Explain the concept of Molecular Computing and Optimal Computing	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		H	H	H	H	H		H	H	H
CO2	M	M		M	M	M		H			M	M
CO3	H	H		H		M	H	M	H	H	H	H
CO4	M	M		M	M	M	M	H	M	H	H	H
CO5	M	M		M	H	H	M				M	M

Units	Content	Hrs
Unit I	NANOCOMPUTING-PROSPECTS AND CHALLENGES Introduction - History of Computing - Nanocomputing - Quantum Computers - Nanocomputing Technologies - Nano Information Processing - Prospects and Challenges - Physics of Nanocomputing : Digital Signals and Gates - Silicon Nanoelectronics - Carbon Nanotube Electronics - Carbon Nanotube Field-effect Transistors – Nanolithography	18
Unit II	NANOCOMPUTING WITH IMPERFECTIONS Introduction - Nanocomputing in the Presence of Defects and Faults - Defect Tolerance - Towards Quadrillion Transistor Logic Systems	18
Unit III	RELIABILITY OF NANOCOMPUTING Markov Random Fields - Reliability Evaluation Strategies - NANOLAB - NANOPRISM - Reliable Manufacturing and Behavior from Law of Large Numbers	18
Unit IV	NANOSCALE QUANTUM COMPUTING Quantum Computers - Hardware Challenges to Large Quantum Computers - Fabrication, Test, and Architectural Challenges - Quantum-dot Cellular Automata (QCA) - Computing with QCA - QCA Clocking - QCA Design Rules	18
Unit V	QCADESIGNER SOFTWARE AND QCA IMPLEMENTATION Basic QCA Circuits using QCADesigner - QCA Implementation - Molecular and Optical Computing: Molecular Computing - Optimal Computing - Ultrafast Pulse Shaping and Tb/sec Data Speeds	18
	Total Contact Hrs	**90**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Assignment, Case Study

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Sahni V. and Goswami D	Nano Computing (Unit 1 to 5)	McGraw Hill Education Asia Ltd	2008

Reference Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Sandeep K. Shukla and R. Iris Bahar	Nano, Quantum and Molecular Computing	Kluwer Academic Publishers	2004
2	Sahni V	Quantum Computing	McGraw Hill Education Asia	2007
3	Jean-Baptiste Waldner	Nanocomputers and Swarm Intelligence	John Wiley & Sons	2008

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Ms.N.DIVYA Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC622			Title	Batch:	2022 - 2025
				Core Lab - IX : Mobile Application Development	Semester:	VI
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To design and implement various mobile applications and learn how to deploy applications to hand-held devices.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember essential Android Programming concepts.	K1
CO2	Understand various Android Applications related to layouts and rich uses interactive interfaces.	K2
CO3	Apply native application using GUI components and Mobile application development framework.	K3
CO4	Analyze Android applications to the app market.	K4
CO5	Evaluate mobile applications for the current scenario.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M		M	H	H	M	H	M	H	H	H
CO2	M	H	M	H	H	M		H	M		H	M
CO3	M	M		M	H	M		H	M		M	M
CO4	H	H	M	M	H	M		M	H	H	H	H
CO5	H	M		H	M	H	M	H	M	M	M	H

1. Create "Hello World" Application.
2. Create Application by Using Widgets, Creating the Application by using the Activity class
3. Creating the Application by using Tex Edit control.
4. Creating the Application Choosing Options Check Box.
5. Creating the Application Choosing Options Radio Button.
6. Creating the Application Choosing Options Radio Group.
7. Creating the Application Choosing Options Spinner.
8. Create Application by Using Building Blocks for Android Application design by using Linear Layout
9. Create Application by Using Building Blocks for Android Application design by using Relative Layout.
10. Create Application by Using Building Blocks for Android Application design by using Absolute Layout.
11. Design the Application for Menus and Action Bar.
12. Design the application to display the Drop-Down List Action Bar.

Total Contact Hours : 60

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr.S.DILIP KUMAR Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC623			Title	Batch:	2022 - 2025
				Core Lab - X : PHP Programming	Semester:	VI
Practical Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To measure the student's knowledge about the PHP script languages and to demonstrate how to store and retrieve data from the database and also helps the students to setup a better career.

Course Outcomes

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

CO Number	Co Statement	Knowledge Level
CO1	Recall the fundamentals of PHP Script.	K1
CO2	Understand the concept of loops in PHP.	K2
CO3	Apply the concept of Functions and Arrays in PHP.	K3
CO4	Analyze the usage of Database in PHP.	K4
CO5	Evaluate the PHP and WAMP Server Connectivity.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H	L		M	M	L			M	H	M
CO2	H	M	M	H	H	H			M	M	H	M
CO3	H	H	M		H	M	L	M		M	H	M
CO4	L	H	H	M	M	M	M		M	M	H	M
CO5	M	L	M	M	M	H	H		H	H	H	H

1. Write a PHP script for Arithmetic operation.
2. Write a PHP script which will display the colors.
3. Write a PHP script using nested for loop that creates a chess board.
4. Write a function to sort an array.
5. Write a PHP function that checks if a string is all lowercase.
6. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birthday.
7. Write a PHP script to generate simple random password.
8. Program to Store and Read an image in Database.
9. Program to Insert records to the table in Database and fetch records from the table in Database.
10. Create a Contact Form using PHP and WAMP server connectivity.

Total Contact Hours : 75

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Mr. D.POOBATHY Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R. MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6S3			Title	Batch:	2022-2026
				Skill Enhancement Course (SEC) IV: Naan Mudhalvan : Interview Readiness	Semester:	VI
Lecture Hrs./Week	3	Tutorial Hrs./ Sem.			Credits:	02

Course Objective

To develop the student broad career plans, evaluate the employment market, identify the organizations to get good placement, match the job requirements and skill sets.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the communication and interpersonal skills.	K1
CO2	Understand the abilities and competencies.	K2
CO3	Apply the concept of strengthening the skills.	K3
CO4	Analyze the Technical and Case Interviews.	K4
CO5	Evaluate the interview challenges and utilize them for future purpose.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H			H					H	M	H
CO2		H		M	H	M				H		H
CO3			M		H				M	H		H
CO4	M	M			H	M	M	H	H	H	H	H
CO5		M			H			M	M	H	M	H

Units	Content	Hrs
Unit I	**Interview Process:** Introduction to different types of interviews - Importance of interview preparation - Stages of the interview process - Written test - Common interview formats and structures-Role of body language and - communication in interviews	9
Unit II	**Mastering Behavioral Interviews :** Understanding the STAR (Situation, Task, Action, Result) method - Analyzing common behavioral interview questions - Crafting impactful stories to showcase our abilities - Addressing competency-based questions with confidence - Handling challenging behavioral questions and turning them to our advantage.	9
Unit III	**Crafting our Personal Brand:** Identifying your strengths, skills, and experiences - Developing a compelling elevator pitch - Creating a strong online presence - Aligning our personal brand with the job seeking - Showcasing our achievements and projects effectively.	9
Unit IV	**Excelling in Technical and Case Interviews:** Preparing for technical assessments and coding challenges - Reviewing key technical concepts relevant to the role - Approaches to solving case interview questions - Developing structured frameworks for analyzing cases - Presenting logical and organized solutions during the interview.	9
Unit V	**Navigating Common Interview Challenges:** Handling nerves and anxiety before and during interviews - Addressing gaps in our resume or experience - Responding to tricky questions or unexpected scenarios - Negotiating salary, benefits, and other job offer components - Seeking and providing effective feedback after interviews.	9
	Total Contact Hrs	**45**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLEOFTHEBOOK	PUBLISHERS \EDITION	YEAR OFPUBLICATION
1	Barun K.Mitra	Personality Development and soft skills	Oxford University Press	2011
2	Patrick Mc Name	Success in Interviews: How to succeed in any job interview	PBMCN Publishers	2011
3	James Storey	The Art of the Interview: The perfect answers to every Interview question	Online Publication	2016

Reference Books

S.NO	AUTHOR	TITLEOFTHEBOOK	PUBLISHERS \EDITION	YEAR OFPUBLICATION
1	Nitin Bhatnagar	Effective Communication and Soft Skills	Pearson Education India	2011

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr. D.UMAMAHESWARI	Name: Dr. K.HARIDAS Signature:	Name: Mr. K.SRINIVASAN Signature:	Name: Dr. R.MANICKACHEZIAN Signature:

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6S4			Title	Batch:	2022-2026
				Skill Enhancement Course: A 360° Interview Preparation Course	Semester:	VI
Lecture Hrs./Week	3	Tutorial Hrs./Sem			Credits:	02

Course Objective

To develop the student broad career plans, evaluate the employment strategies, identify the tricks to get good placement, match the job requirements and skill sets.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the types of interviews and companies.	K1
CO2	Understand the personal capabilities.	K2
CO3	Apply the concept of tackling situations.	K3
CO4	Analyze the Technical and Case Interviews.	K4
CO5	Evaluate the confidence and bouncing back.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H			H					H	M	H
CO2		H		M	H	M				H		H
CO3			M		H				M	H		H
CO4	M	M			H	M	M	H	H	H	H	H
CO5		M			H			M	M	H	M	H

Units	Content	Hrs
Unit I	**Inside Interviews: What to Expect** - Different types of interviews we might encounter - Written test - Why researching the company is a big deal - What interviewers want to see in candidates - Learning about behavior, tech, and other types of interviews - Making a plan to do well in any interview.	9
Unit II	**Creating Your Professional Image:** Finding what we're good at and what we want - Making a personal pitch that stands out - Setting up our online presence - Making sure our image fits the job we want - Telling stories that show off what we've done.	9
Unit III	**Acing Questions:** How to answer with STAR: Situation, Task, Action, Result - Understanding different questions they might ask - Sharing interesting stories about our self - What to do when they ask tricky situations - Practicing different scenarios to be ready.	9
Unit IV	**Handling Tech and Tough Situations:** Getting ready for technical tests or coding questions - Remembering important technical stuff for the job - Solving tough problems and cases step by step - Explaining your solutions confidently - Doing mock interviews to stay calm under pressure.	9
Unit V	**Feeling Confident and Bouncing Back:** Tricks to calm your nerves before interviews - Doing mindfulness exercises for self-confidence - Dealing with common problems like gaps in your work history - Learning from things that didn't go well - Keeping a positive attitude and showing we're confident.	9
	Total Contact Hrs	**45**

- The topics given in **Italics** are noted as Self-Study topics.

Pedagogy and Assessment Methods:

Seminar, Power Point Presentation, Chalk and talk, Quiz, Assignments, Group Task.

22UBC6S4

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Bari A. Williams	Diversity in the Workplace: Eye-opening Interviews to Jumpstart Conversations about Identity, Privilege and Bias	Rockbridge Press	2020
2	Christopher Mulligan and Craig Taylor	Talent Keepers: How top leaders engage and retain their best performers	Wiley Publications	2019

Reference Books

S.NO	AUTHOR	TITLEOFTHEBOOK	PUBLISHERS \EDITION	YEAR OFPUBLICATION
1	Rhamy Alejeal	People Processes: How your people can be your organization's competitive advantage	Online Publication	2018
2	Simon Sinek	Start with Why: How great leaders inspire everyone to take action	Portfolio Publications	2011

Course Designed by	HOD	CDC	COE
Name and Signature	Name and Signature	Name and Signature	Name and Signature
Name: Dr. D.UMAMAHESWARI	Name: Dr. K.HARIDAS Signature:	Name: Mr. K.SRINIVASAN Signature:	Name: Dr. R.MANICKACHEZIAN Signature: