B. Sc. COMPUTER SCIENCE

Syllabus

AFFILIATED COLLEGES

Program Code: 22K

2020 – 2021 onwards

BHARATHIAR UNIVERSITY

(A State University, Accredited with "A" Grade by NAAC,
Ranked 13th among Indian Universities by MHRD-NIRF,
World Ranking : Times - 801-1000, Shanghai - 901-1000, URAP - 982)

Coimbatore - 641 046, Tamil Nadu, India

Program Educational Objectives (PEOs)	
The **B. Sc. Computer Science** program describe accomplishments that graduates areexpected to attain within five to seven years after graduation	
PEO1	To enrich knowledge in core areas related to the field of computer science andmathematics.
PEO2	To provide opportunities for acquiring in-depth knowledge in Industry 4.0/5.0 tools and techniques and there by design and implement software projects to meet customer's business objectives.
PEO3	To enable graduates to pursue higher education leading to Master and Research Degrees or have a successful career in industries associated with Computer Science or as entrepreneurs
PEO4	To enhance communicative skills and inculcate team spirit through professional activities, skills in handling complex problems in data analysis and research project to make them a better team player.
PEO5	To embed human values and professional ethics in the young minds andcontribute towards nation building.
PEO9	To develop project

Program Specific Outcomes (PSOs)	
After the successful completion of **B.Sc. Computer Science** program, the students areexpected to	
PSO1	Impart the fundamental principles and methods of Computer Science to a widerange of applications.
PSO2	Develop and deploy applications of varying complexity using the acquired knowledge in various programming languages, data structures and algorithms, database and networking skills.
PSO3	To investigate, analyze complex problems by the application of suitable mathematical and research tools, to design Information Technology products andsolutions
PSO4	To identify and utilize the state-of-the-art tools and techniques in the design anddevelopment of software products and solutions.
PSO5	Ability to identify, interpret, analyze and design solutions using appropriate algorithms of varying complexities in the field of information and communication technology.

Program Outcomes (POs)	
On successful completion of the B.Sc. **Computer Science** program	
PO1	**Disciplinary knowledge:** Capable to apply the knowledge of mathematics, algorithmic principles and computing fundamentals in the modeling and design of computer based systems of varying complexity.
PO2	**Scientific reasoning/ Problem analysis**: Ability to critically analyze, categorizes,formulate and solve the problems that emerges in the field of computer science.
PO3	**Problem solving:** Able to provide software solutions for complex scientific and business related problems or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societaland environmental considerations.
PO4	**Environment and sustainability:** Understand the impact of software solutionsin environmental and societal context and strive for sustainable development.
PO5	**Modern tool usage:** Use contemporary techniques, skills and tools necessary forintegrated solutions.
PO6	**Ethics:** Function effectively with social, cultural and ethical responsibility as an individual or as a team member with positive attitude.
PO7	**Cooperation / Team Work:** Function effectively as member or leader onmultidisciplinary teams to accomplish a common objective.
PO8	**Communication Skills:** An ability to communicate effectively with diversetypes of audience and also able to prepare and present technical documents to different groups.
PO9	**Self-directed and Life-long Learning:** Graduates will recognize the need forself-motivation to engage in lifelong learning to be in par with changing technology.
PO10	Enhance the research culture and uphold the scientific integrity and objectivity

BHARATHIAR UNIVERSITY: :
COIMBATORE 641 046

B. Sc. Computer Science Curriculum
(For the students admitted during the academic year 2020 – 21 onwards)

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
FIRST SEMESTER							
	Language – I	4	6		25	75	100
	English – I	4	6		25	75	100
	Core1: Computing Fundamentals and C Programming	4	4		25	75	100
	Core 2: Digital Fundamentals and Computer Architecture	4	4		25	75	100
	Core Lab 1: Programming Lab – C	4		3	40	60	100
	Allied 1: Mathematical Structures for ComputerScience	4	5		25	75	100
	Environmental Studies #	2	2		-	50	50
Total		**26**	**27**	**3**	**165**	**485**	**650**
SECOND SEMESTER							
	Language – II	4	6		25	75	100
	English – II	4	6		25	75	100
	Core 3: C++ Programming	4	5		25	75	100
	Core Lab 2: Programming Lab – C++	4		4	40	60	100
	Core Lab 3: Internet Basics	2		2	20	30	50
	Allied 2: Discrete	4	5		25	75	100

	Mathematics						
	Value Education – HumanRights #	2	2		-	50	50
Total		**24**	**24**	**6**	**160**	**440**	**600**
THIRD SEMESTER							
	Core 4: Data Structures	4	6		25	75	100
	Core 5: Java Programming	4	6		25	75	100
	Core Lab 4: Programming Lab – Java	4		5	25	75	100
	Allied 3: Computer Based Optimization Techniques	4	6		25	75	100
	Skill based Subject 1 : Software Engineering and Software Project Management	3	5		20	55	75
	Tamil @/ Advanced Tamil (OR) Non-major elective-1 (Yoga for Human Excellence)# / Women's Rights#	2	2		-	50	50
Total		**21**	**25**	**5**	**120**	**405**	**525**
FOURTH SEMESTER							
	Core 6: System Software andOperating System	4	6		25	75	100
	Core 7: Linux and ShellProgramming	4	6		25	75	100
	Core Lab 5: Linux and ShellProgramming Lab	4		6	40	60	100
	Allied 4: Business Accounting	4	6		25	75	100
	Skill based subject 2 (lab) : Software Project Management-Lab	3	4		30	45	75

	Tamil @/ Advanced Tamil (OR) Non-major elective-II (General Awareness) #	2	2		-	50	50
	Total	**21**	**24**	**6**	**145**	**380**	**525**
FIFTH SEMESTER							
	Core 8: RDBMS & Oracle	4	6		25	75	100
	Core 9: Visual Basic	4	6		25	75	100
	Core Lab 6: Programming Lab – VB & Oracle	4		6	40	60	100
	Elective-I PYTHON Programming/ Computer Networks / Organizational Behavior	4	6		25	75	100
	Skill based Subject 3: SoftwareTesting	3	6		20	55	75
	Total	**19**	**24**	**6**	**135**	**340**	**475**
SIXTH SEMESTER							
	Core 10: Graphics &Multimedia	4	5		25	75	100
	Core 11: Project Work Lab %%	8	5		-	200	200
	Core Lab 7: Programming Lab– Graphics & Multimedia	4		6	40	60	100
	Elective-II : Network Security and Cryptography / Artificial Intelligence and Expert Systems / Web Technology	4	5		25	75	100
	Elective-III : Data Mining / Open Source Software / Internetof Things (IoT)	4	5		25	75	100
	Skill based Subject 4 (lab) : Software Testing Lab	3		4	30	45	75

	Extension Activities	2			50	-	50
Total		**29**	**20**	**10**	**195**	**530**	**725**
Grand Total		**140**	**144**	**36**	**920**	**2580**	**3500**
ONLINE COURSES							

First Semester

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER - I

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
FIRST SEMESTER							
	Language – I	4	6		25	75	100
	English – I	4	6		25	75	100
	Core 1: Computing Fundamentals and C Programming	4	4		25	75	100
	Core 2: Digital Fundamentals and Computer Architecture	4	4		25	75	100
	Core Lab 1: Programming Lab – C	4		3	40	60	100
	Allied 1: Mathematical Structures for Computer Science	4	5		25	75	100
	Environmental Studies #	2	2		-	50	50
Total		**26**	**27**	**3**	**165**	**485**	**650**

PART – I – LANGUAGE

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

செய்யுள் திரட்டு

முதல் பருவம் - பகுதி - I, தமிழ் தாள் - I

(2020 - 2021ஆம் கல்வியாண்டில் சேர்வோர்க்குரியது)

(செய்யுள், சிறுகதை, இலக்கணம், இலக்கிய வரலாறு, மொழிபெயர்ப்பு)

பாரதியார் பல்கலைக்கழகம், கோயம்புத்தூர்.

பொருளடக்கம்

முதல் பருவம்

அலகு - I

1.	எங்கள் தாய்	- பாரதியார்	7
2.	தமிழின் இனிமை	- பாரதிதாசன்	9
3.	ஒரு கந்தல் துணியின் கதை	- கண்ணதாசன்	11
4.	வருங்கால மனிதன் வருக!	- தமிழ் ஒளி	14
5.	ஓடு... ஓடு... சங்கிலி	- சிற்பி	16
6.	இது வித்தியாசமான தாலாட்டு	- வைரமுத்து	19

அலகு - II

7.	காலம் பிரசவித்த மற்றொரு காலம்	- பச்சியப்பன்	23
8.	காடு	- பழநி பாரதி	25
9.	இயற்கைக்குத் திரும்புவோம்	- தேவயானி	27
10.	இலக்கியத்தில் பெண்கள்	- செல்வகுமாரி	30
11.	ஹைக்கூக் கவிதைகள்	- அறிவுமதி	34
12.	நாட்டுப்புறப்பாடல்கள்		
	1. தாலாட்டு		36
	2. தொழிற்பாடல்கள்		37

அலகு - III

தேர்ந்தெடுக்கப்பட்ட சிறுகதைகள் NCBH-வெளியீடு

அலகு - IV

1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
2. ஹைக்கூக் கவிதைகள்
3. பாரதி. பாரதிதாசன் இலக்கியப்பணி
4. சிறுகதையின் தோற்றமும் வளர்ச்சியும்

அலகு - V

1. வல்லினம் மிகுமிடம்
2. வல்லினம் மிகாவிடம்
3. தொடரில் வழுஉச் சொற்களை நீக்கி எழுதுதல்
4. ஒருமை பன்மை மயக்கம் நீக்கி எழுதுதல்

மொழிபெயர்ப்புப் பகுதி -

ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல்.

பொதுப்பகுதி. அலுவலகப்பகுதி.

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code	HD2	HINDI PAPER -II	L	T	P	C
Part I		PART I	3	-	-	3
Pre-requisite			Syllabus Version			2020-21

- **COURSE OBJECTIVE:**
  - A basic understanding of contemporary poetry can be gained and the nature ofmodern poetry can be realized.
  - Realizing the nature of drama and its nature and improving the knowledge of reading and understanding the nature of contemporary plays.
  - Understands the benefits of correspondence and can enhance thecorrespondence you need.
  - Translation is especially useful for translating from Hindi to English

	PART I - HINDI II	
Unit No.		**Hours**
I	**MODERN POETRY :** **PANCHVATI by MYTHLI SHARAN GUPT**	**18**
II	**ONE ACT PLAY: EKANIKI PIYUSH** 1. Owrangjeb ki aakirirath– Ramkumar varma 2. Ek din - Lakshminarayan Misra 3. Vapasi - Vishnuprabhakar 4. Badsurath rajkumari - Krishnachandra 5. Aakket - Harijeeth	**18**
III	**LETTER WRITING** (Leave Letter, Job Application, Ordering Books, Letter to Publisher,Personal Letter)	**10**

IV	**CONVERSATION**: (Doctor & Patient, Teacher & Student, Storekeeper & Buyer, Two Friends, Booking Clerk & Passenger at Railway Station, Auto rickshaw driver and Passenger)Ref : Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan VaniPrakashan, New Delhi.	**12**
V	**TRANSLATION: HINDI-ENGLISH ONLY** Lessons – 1-15 onlyANUVADH ABYAS-III	**14**
	TOTAL	**72**

Text Book:

Panchvati, Mythili sharan Gupt, 2015, Rajkamal Prakashan,1B Nethaji Subash Marg,New Delhi.
Ekaniki piyush ,Srimathi Usha mehra, 1999, Hindu sahithya Bhandar,55 choupattyan rode,Lacknow 226003

Reference Books:

Bolchal Ki Hindi Aur Sanchar, 2015, Dr. Madhu Dhavan Vani Prakashan, New Delhi.

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SCHEME OF EXAMINATION - CBCS PATTERN

Part 1 - French 1	
Unit No.	**Topics**
1	Etape 0
	Etape 1 (Lecons 1 - 3)
2	Etape 2 (Lecons 1 - 3)
3	Etape 3 - Leçons 1 - 2
4	Etape 3 – Leçon 3
	Etape 4 – Leçon 1
5	Etape 4 – Leçons 2 - 3
Etapes 0 to 4, Pages 11 to 62	

Text Book Prescribed:

Adomania 1 – Methode de francais Authors: Céline Himber, Corina Brillant, Sophie Erlich

Publisher: HACHETTE FLE

Available at: GOYAL Publishers and Distributors Pvt Ltd, New Delhi (9810322459)

Reference:

Latitudes 1

Author: Yves Loiseau, Régine Merieux Publisher: French and European Publications Inc.

Available at: GOYAL publishers and distributors Pvt Ltd, New Delhi (9810322459).

PART – II – ENGLISH

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code	**12E**	**PART II – ENGLISH-I**	**L**	**T**	**P**	**C**
PART II ENGLISH		**COMMUNICATIVE ENGLISH**	**4**	**-**	**-**	**4**
Pre-requisite		**Basic knowledge of Englishlanguage**	**Syllabus Version**		2020-2021	

Course Objectives:

The main objective of this course is to:

1. Enable the students to communicate effectively and appropriate in day-today conversations.

Expected Course Outcomes:

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

1	To understand basic language skills through listening and reading	K1
2	To understand basic English grammar and use effectively	K2, K3
3	To enhance word power to speak and write effectively	K3
4	To improve flawless writing and speaking in day to day situations	K4
5	To communicate effectively	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**-**	**20hours**

1. Listening and Speaking - Introducing self and others -Listening for specific information Pronunciation (without phonetic symbols) -Essentials of pronunciation - American and British pronunciation
2. Reading and Writing -Reading short articles – newspaper reports / fact based articles i. Skimming and scanning ii. Diction and tone - iii. Identifying topic sentences Reading aloud: Reading an article/report - Journal (Diary) Writing
3. Study Skills - 1
   a. Using dictionaries, encyclopaedias, thesaurus
4. Grammar in Context: Naming and Describing • Nouns & Pronouns •Adjectives

Unit:2	**-**	**20hours**

1. LISTENING AND SPEAKING –
a. Listening with a Purpose -b. Effective Listening
c. Tonal Variation d. Listening for Information e. Asking for Information f. Giving Information and Writing 1. a. Strategies of Reading: Skimming and Scanning b. Types of Reading: Extensive and Intensive Reading c. Reading a prose passage d. Reading a poem e. Reading a short story 2.Paragraphs: Structure and Types
a. What is a Paragraph? b. Paragraph structure c. Topic Sentence
d. Unity e. Coherence f. Connections between Ideas: Using Transitional words and expressions g.Types of Paragraphs
3. Study Skills II:
Using the Internet as a Resource a. Online search b. Know the keyword of India c. Refine your search d. Guidelines for using the Resources e. e-learning resources of Government f. Terms to know
4. Grammar in Context Involving Action-I a. Verbs b. Concord

Unit:3		**15hours**

1. Listening and Speaking -Giving and following instructions -Asking for and giving directions
-Continuing discussions with connecting ideas
2. Reading and writing -Reading feature articles (from newspapers and magazines) - Reading to identify point of view and perspective (opinion pieces, editorials etc.) - Descriptive writing – writing a short descriptive essay of two to three paragraphs.
3. Grammar in Context:-Involving Action :Verbals - Gerund, Participle, Infinitive • Modals

Unit:4	**-**	**16 hours**

1. Listening and Speaking- a. Giving and responding to opinions
2. Reading and writing a. Note taking b. Narrative writing – writing narrative essays of two to three paragraphs
3. Grammar in Context: Tense • Present •Past • Future

Unit:5		**18 hours**
1. Listening and Speaking a. Participating in a Group Discussion 2. Reading and writing - Reading diagrammatic information - interpretations maps, graphs andpie charts - Writing short essays using the language of comparison andcontrast 3.Grammar in Context: Voice (showing the relationship between Tense and Voice)		
Unit:6	**Contemporary Issues**	**2 hours**
	Total Lecture hours	**75hours**

Text Book(s)

COMMUNICATIVE ENGLISH –TANSCHE

Reference Books

1	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://onlinecourses.nptel.ac.in/noc20_hs14/preview

Course Designed By:

PART – III – CORE

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Computing Fundamentals and C Programming**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Core Paper: 1**	**4**	**0**	**0**	**4**
Pre-requisite		Students should have basic Computer Knowledge	**Syllabus Version**	2020-21 Onwards		

Course Objectives:

The main objectives of this course are to:

1. To impart knowledge about Computer fundamentals
2. To understand the concepts and techniques in C Programming
3. To equip and indulge themselves in problem solving using C

Expected Course Outcomes:

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

1	Learn about the Computer fundamentals and the Problem solving	**K2**
2	Understand the basic concepts of C programming	**K2**
3	Describe the reason why different decision making and loop constructs areavailable for iteration in C	**K3**
4	Demonstrate the concept of User defined functions , Recursions , Scope andLifetime of Variables, Structures and Unions	**K4**
5	Develop C programs using pointers Arrays and file management	**K3**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Fundamentals of Computers & Problem Solving in C**	**12 hours**

Fundamentals of Computers : Introduction – History of Computers-Generations of Computers- Classification of Computers-Basic Anatomy of a Computer System-Input Devices-Processor- Output Devices-Memory Management – Types of Software-Overview of Operating System- Programming Languages-Translator Programs-Problem Solving Techniques - Overview of C.

Unit:2	**Overview of C**	**15 hours**

Overview of C - Introduction - Character set - C tokens - keyword & Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement operators - Arithmetic Expressions - Evaluation of expression - precedence of arithmetic operators - Type conversion in expression – operator precedence & associativity - Mathematical functions - Reading & Writing a character - Formatted input and output.		
Unit:3	**Decision Making , Looping and Arrays**	**15 hours**
Decision Making and Branching: Introduction – if, if….else, nesting of if …else statements- else if ladder – The switch statement, The ?: Operator – The goto Statement. Decision Making and Looping: Introduction- The while statement- the do statement – the for statement-jumps in loops. Arrays – Character Arrays and Strings		
Unit:4	**User-Defined Functions, Structures and Unions**	**15 hours**
User-Defined Functions: Introduction – Need and Elements of User-Defined Functions- Definition-Return Values and their types - Function Calls – Declarations – Category of		
Unit:5	**Pointers & File Management**	**15 hours**
Pointers: Introduction-Understanding pointers -Accessing the address of a variable Declaration and Initialization of pointer Variable – Accessing a variable through its pointer Chain of pointers- Pointer Expressions – Pointer Increments and Scale factor- Pointers and Arrays- Pointers and Strings – Array of pointers – Pointers as Function Arguments Functions returning pointers – Pointers to Functions – Pointers and Structures. File Management in C.		
Unit:6	**Contemporary Issues**	**3 hours**
Problem Solving through C Programming - Edureka		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	E Balagurusamy: Computing Fundamentals & C Programming – Tata McGraw-Hill, SecondReprint 2008
Reference Books	
1	Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson, 2002.
2	Henry Mullish & Hubert L.Cooper: The Sprit of C, Jaico, 1996.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	Introduction to Programming in C - NPTEL
2	Problem solving through Programming in C - SWAYAM
3	C for Everyone : Programming Fundamentals - Coursera
Course Designed By:	

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Digital Fundamentals and Computer Architecture**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Core Paper : 2**	**4**	**0**	**-**	**4**
Pre-requisite		**Student should have basic computerknowledge**	**Syllabus Version**	2020-21 Onwards		

Course Objectives:

On successful completion of this subject the students should have Knowledge on

1. To familiarize with different number systems and digital arithmetic & logic circuits
2. To understand the concepts of Combinational Logic and Sequential Circuits
3. To impart the knowledge of buses, I/O devices, flip flops, Memory and bus structure.
4. To understand the concepts of memory hierarchy and memory organization
5. To understand the various types of microprocessor architecture

Expected Course Outcomes:

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

1	Learn the basic structure of number system methods like binary, octal and hexadecimal and understand the arithmetic and logical operations are performed by computers.	K3
2	Define the functions to simplify the Boolean equations using logic gates.	K1
3	Understand various data transfer techniques in digital computer and control unitoperations.	K2
4	Compare the functions of the memory organization	K4
5	Analyze architectures and computational designs concepts related to architectureorganization and addressing modes	K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Number System and Arithmetic circuits**	**12 hours**

Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal – Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code. Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Half subtractor, Full subtractor, Parallel binary subtractor - Digital Logic: The Basic Gates – NOR, NAND, XOR Gates.

Unit:2	**Combinational Logic and Sequential Circuits**	**14 hours**

Combinational Logic Circuits: Boolean algebra – Karnaugh map – Canonical form Construction and properties – Implementations – Don't care combinations - Product of sum, Sum of products, Simplifications. Sequential circuits: Flip-Flops: RS, D, JK, and T - Multiplexers – Demultiplexers –Decoder Encoder – Shift Registers-Counters.		
Unit:3	**Input – Output Organization and Data Transfer**	**12 hours**
Input – Output Organization: Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. Asynchronous data transfer: Strobe Control and Handshaking – Priority Interrupt: Daisy-Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – OutputProcessor: CPU-IOP Communication.		
Unit:4	**Memory Organization**	**10 hours**
Memory Organization: Memory Hierarchy – Main Memory- Associative memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping – Writing into Cache Initialization. Virtual Memory: Address Space and Memory Space, Address Mapping Using Pages, Associative Memory, Page Table, Page Replacement.		
Unit:5	**Case Studies**	**6 hours**
CASE STUDY: Pin out diagram, Architecture, Organization and addressing modes of 80286-80386-80486-Introduction to microcontrollers.		
Unit:6	**Contemporary Issues**	**2 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**56 hours**

Text Book(s)	
1	Digital principles and applications, Albert Paul Malvino, Donald P Leach, TMH, 1996.
2	Computer System Architecture -M. Morris Mano , PHI.
3	Microprocessors and its Applications-Ramesh S. Goankar
Reference Books	
1	Digital Electronics Circuits and Systems, V.K. Puri, TMH.
2	Computer Architecture, M. Carter, Schaum's outline series, TMH.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://nptel.ac.in/courses/106/103/106103068/
2	http://www.nptelvideos.in/2012/12/digital-computer-organization.html
3	http://brittunculi.com/foca/materials/FOCA-Chapters-01-07-review-handout.pdf
Course Designed By:	

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Programming Lab – C**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Core Lab: 1**	**0**	**0**	**3**	**4**
Pre-requisite		Students should have basic knowledge in C programming and algorithms	**Syllabus Version**	2020-21 Onwards		

Course Objectives:

The main objectives of this course are to:

1. To practice the Basic concepts, Branching and Looping Statements and Strings in Cprogramming
2. To implement and gain knowledge in Arrays, functions, Structures, Pointers and File handling

Expected Course Outcomes:

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

1	Remember and Understand the logic for a given problem and to generate Primenumbers & Fibonacci Series **(Program-1,2,3)**	**K1, K2**
2	Apply the concepts to print the Magic square, Sorting the data , Strings, Recursivefunctions and Pointers **(Program-4,5,6,8,10)**	**K2, K3**
3	Remember the logic used in counting the vowels in a sentence **(Program-7)**	**K1**
4	Apply and Analyze the concepts of Structures and File management **(Program-9,11,12)**	**K3&K4**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**

1. Write a C program to find the sum, average, standard deviation for a given set of numbers.
2. Write a C program to generate n prime numbers.
3. Write a C program to generate Fibonacci series.
4. Write a C program to print magic square of order n where n > 3 and n is odd.
5. Write a C program to sort the given set of numbers in ascending order.
6. Write a C program to check whether the given string is a palindrome or not using pointers.
7. Write a C program to count the number of Vowels in the given sentence.
8. Write a C program to find the factorial of a given number using recursive function.

9. Write a C program to print the students Mark sheet assuming roll no, name, and marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the universitypattern.		
10. Write a function using pointers to add two matrices and to return the resultant matrix to thecalling function.		
11. Write a C program which receives two filenames as arguments and check whether the filecontents are same or not. If same delete the second file		
12. Write a program which takes a file as command line argument and copy it to another file. Atthe end of the second file write the total i) no of chars ii) no. of words and iii) no. of lines.		
	Total Lecture hours	**36 hours**
Text Book(s)		
1	E Balagurusamy: Computing Fundamentals & C Programming – Tata McGraw-Hill, SecondReprint 2008	
Reference Books		
1	Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson, 2002.	
2	Henry Mullish & Hubert L.Cooper: The Sprit of C, Jaico, 1996.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	Introduction to Programming in C – NPTEL	
2	Problem solving through Programming in C - SWAYAM	
3	C for Everyone : Programming Fundamentals – Course	
Course Designed By:		

PART – III – ALLIED - I

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

ALLIED SUBJECT -1

MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE

Subject Description: This subject deals with mathematical concepts like Matrices, Numerical analysis and Statistical methods for computer science and applications.

Goal: To learn about the mathematical structures for computer based applications.

Objective: On successful completion of this subject the students should have

- Understood the concepts of mathematics
- Learnt applications of statistical and numerical methods for Computer Science.

UNIT I:

Matrices – Introduction – Determination – Inverse of a matrix – Rank of a Matrix – Eigen value Problems.

UNIT II:

System of Simultaneous Linear algebraic Equation – Gauss elimination, Gauss Jordon, Gauss Seidal methods.

UNIT III:

Numerical Differentiations – Newton‘s forward Difference - Backward Difference – Starling formula Numerical Integration – Trapezoidal Rule & Simpson‘s rule.

UNIT IV:

Measures of central tendency – Mean Median and Mode – Relationship among mean media and mode. Measures of dispersion – Range, quartile deviation and Standard

UNIT V:

Regression and Correlation – Types of relationship – Linear regression – Correlation – Coefficient of correlation – Regression equation of variables.

TEXT BOOKS:

1. Engineering Mathematics, Volume II, Dr M.K. Venkataraman, National Publishing Company, Chennai. (Unit I)

2. Numerical Methods in Science & Engineering, M.K. Venkataraman, National

Publishing Company, Chennai, Revised Edition -2005 (Unit II & III)

3. Business Statistics, S.P. Gupta & M.P. Gupta, Sultan Chand and Sons (Unit IV & V)

ENVIRONMENTAL STUDIES

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

UNIT – I

Nature of Environmental Studies: Scope of importance- need for awareness Natural resources- Forest, Water, Mineral, Food, Energy and Land Role of an individual in conversation of natural resources Equitable uses of resources for sustainable lifestyles.

UNIT – II

Ecosystems: Concept, Structure and function, Producers consumers & decomposers, energy flow in the ecosystem Ecological succession, Food chains Food webs and ecological pyramids Features of the ecosystem-Forest, Grassland, Desert and Aquatic

UNIT – III

Biodiversity and its conservation: Genetic, Species and Ecosystem diversity Biographical classifications of India Value of Biodiversity, Biodiversity at global, national & local levels, Hot spots of biodiversity Threats to biodiversity, endangered and endemic species of India, Conservation of biodiversity.

UNIT – IV

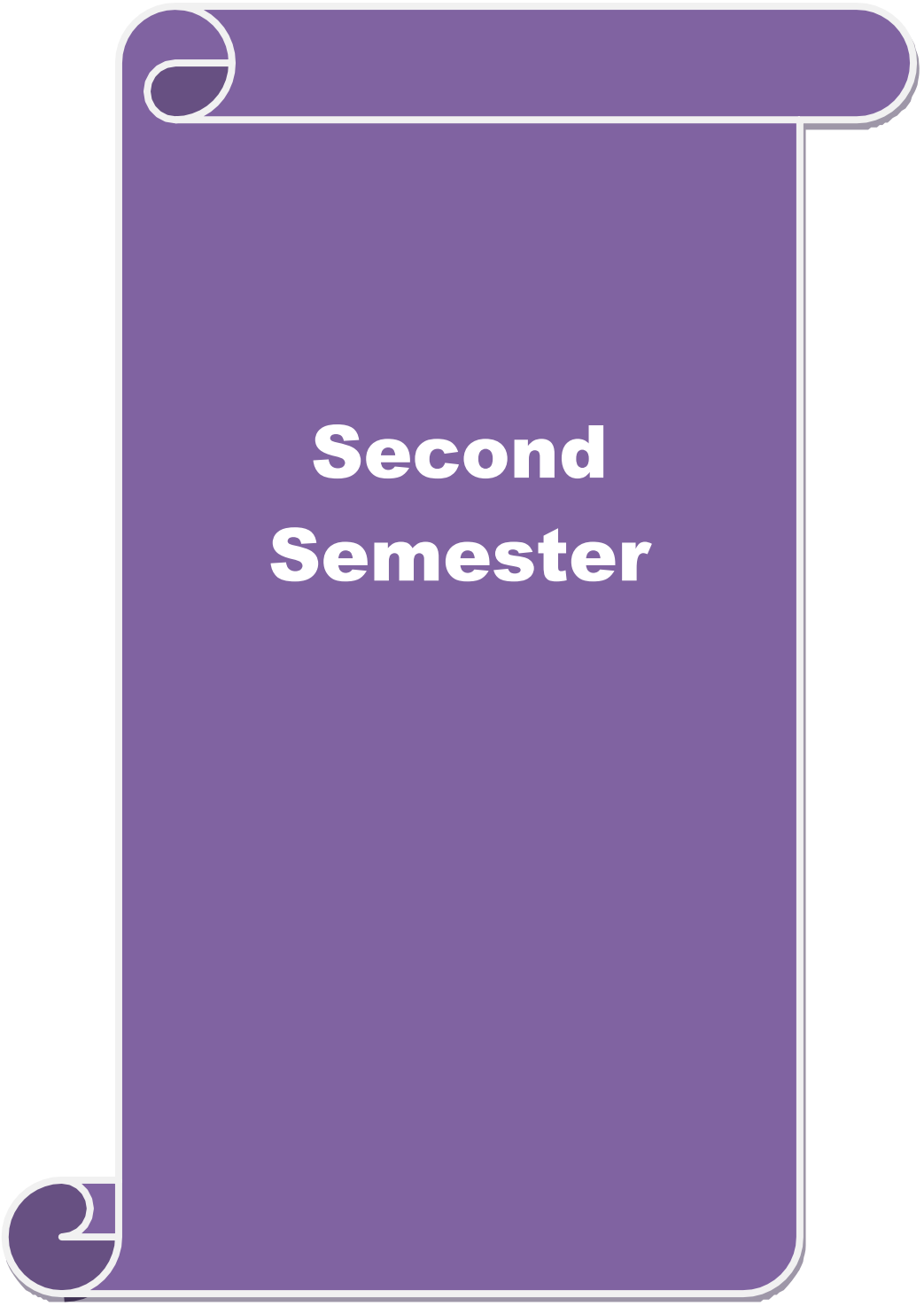
Environmental pollution-Definition, solid waste management Role of an individual in prevention of pollution Pollution case studies disaster management.

UNIT – V

Social issues and the environment- sustainable development, Urban problems related to energy, water conservation, rainwater harvesting, watershed management Resettlement and rehabilitation of people. Environmental ethics; issues and solution-Climate change, global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust, cast studies, Consumerism and waste products .Environmental protection act, Air act, water act, wildlife protection act. Forest conservation act, issues, public awareness, Human population and the environment

TEXT BOOKS:

BOOK A: Foundation course-B “Environmental Studies”, Published by publication division, Bharathiar University, Coimbatore.


Second
Semester

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SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER - II

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
SECOND SEMESTER							
	Language – II	4	6		25	75	100
	English – II	4	6		25	75	100
	Core 3: C++ Programming	4	5		25	75	100
	Core Lab 2: Programming Lab – C++	4		4	40	60	100
	Core Lab 3: Internet Basics	2		2	20	30	50
	Allied 2: Discrete Mathematics	4	5		25	75	100
	Value Education – Human Rights #	2	2		-	50	50
Total		**24**	**24**	**6**	**160**	**440**	**600**

PART – I – LANGUAGE

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

செய்யுள் திரட்டு

இரண்டாம் பருவம் - பகுதி - I, தமிழ் தாள் - II

(2020 - 2021ஆம் கல்வியாண்டில் சேர்வோர்க்குரியது)

(செய்யுள், உரைநடை, இலக்கணம், இலக்கிய வரலாறு, விண்ணப்பம் வரைதல்)

பாரதியார் பல்கலைக்கழகம், கோயம்புத்தூர்.

பொருளடக்கம்

இரண்டாம் பருவம்

அலகு - I

1. திருக்குறள்

அ. இனியவை கூறல் 45

ஆ. உழவு 46

இ. குறிப்பறிதல் (காமத்துப்பால்) 47

2. நாலடியார் - சுற்றம் தழால் 48

3. நான்மணிக்கடிகை - தேர்ந்தெடுக்கப்பட்ட 10 பாடல்கள் 50
(11, 13, 29, 48, 66, 83, 85, 94, 100, 105)

அலகு - II

4. தமிழ்விடு தூது - முதல் 25 கண்ணிகள் 52

5. நாச்சியார் திருமொழி 54
வாரணம் ஆயிரம் எனத் தொடங்கும் 11 பாடல்கள்

6. மாணிக்கவாசகரின் - திருவம்மானை 57

7. சித்தர் பாடல்கள் 60

8. காளமேகப்புலவர் பாடல்கள் 63

அலகு - III

உரைநடைத் தொகுப்பு

1. கலைகள் 64
- உ.வே.சாமிநாத ஐயர்

2. தமிழர் பண்பாடு - ஒரு விளக்கம் 77
- டாக்டர் சோ.நா.கந்தசாமி

3. திருக்குறள் நெறியில் அறிவாண்மை 81
- திருப்பெருந்திரு சாந்தலிங்க இராமசாமி அடிகளார்

4. இணையத் தமிழ் வளர்ச்சி 87
- முனைவர் ப. அர. நக்கீரன்

5. கொங்குநாட்டார் தமிழ்ப்பணி:
காப்பியப் புலவர்கள் 97
- முனைவர் இரா.கா. மாணிக்கம்

அலகு - IV

இலக்கணம்

1. வினா விடை வகைகள்
(அறுவகை வினா, எண் வகை விடை)

2. ஆகுபெயர் விளக்கம் - பயன்பாடு வகைகள் 10

அலகு - V

இலக்கிய வரலாறு

1. பதினெண் கீழ்க்கணக்கு நூல்கள்

2. உரைநடையின் தோற்றமும் வளர்ச்சியும்

பயிற்சிக்குரியன:

விண்ணப்பங்கள், மடல்கள் எழுதச் செய்தல்

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code	HD2	HINDI PAPER -II	L	T	P	C
Part I		PART I	3	-	-	3
Pre-requisite			Syllabus Version			2020-21

- **COURSE OBJECTIVE:**
  - A basic understanding of contemporary poetry can be gained and the nature ofmodern poetry can be realized.
  - Realizing the nature of drama and its nature and improving the knowledge of reading and understanding the nature of contemporary plays.
  - Understands the benefits of correspondence and can enhance thecorrespondence you need.
  - Translation is especially useful for translating from Hindi to English

	PART I - HINDI II	
Unit No.		Hours
I	**MODERN POETRY :** **PANCHVATI by MYTHLI SHARAN GUPT**	18
II	**ONE ACT PLAY: EKANIKI PIYUSH** 1. Owrangjeb ki aakirirath– Ramkumar varma 2. Ek din - Lakshminarayan Misra 3. Vapasi - Vishnuprabhakar 4. Badsurath rajkumari - Krishnachandra 5. Aakket - Harijeeth	18
III	**LETTER WRITING** (Leave Letter, Job Application, Ordering Books, Letter to Publisher,Personal Letter)	10

IV	**CONVERSATION**: (Doctor & Patient, Teacher & Student, Storekeeper & Buyer, Two Friends, Booking Clerk & Passenger at Railway Station, Auto rickshaw driver and Passenger)Ref : Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan VaniPrakashan, New Delhi.	**12**
V	**TRANSLATION: HINDI-ENGLISH ONLY** Lessons – 1-15 onlyANUVADH ABYAS-III	**14**
	TOTAL	**72**

Text Book:

Panchvati, Mythili sharan Gupt, 2015, Rajkamal Prakashan,1B Nethaji Subash Marg,New Delhi.
Ekaniki piyush ,Srimathi Usha mehra, 1999, Hindu sahithya Bhandar,55 choupattyan rode,Lacknow 226003

Reference Books:

Bolchal Ki Hindi Aur Sanchar, 2015, Dr. Madhu Dhavan Vani Prakashan, New Delhi.

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SCHEME OF EXAMINATION - CBCS PATTERN

Part 1 - French 2	
Unit No.	**Topics**
1	Etape 5 (Lecons 1 - 3)
2	Etape 6 (Lecons 1 - 3)
3	Etape 7 - Leçons 1 - 2
4	Etape 7 – Leçon 3
	Etape 8 – Leçon 1
5	Etape 8 – Leçons 2 - 3
Etapes 5 to 8, Pages 63 -114	

Text Book Prescribed:

Adomania 1 – Methode de francais

Authors: Céline Himber, Corina Brillant, Sophie Erlich Publisher: HACHETTE FLE

Available at: GOYAL Publishers and Distributors Pvt Ltd, New Delhi (9810322459)

Reference: Latitudes 1

Author: Yves Loiseau, Régine Merieux Publisher: French and European Publications Inc

Available at: GOYAL publishers and distributors Pvt Ltd, New Delhi (9810322459)

PART – II – ENGLISH

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code	22E	PART II – ENGLISH-II	L	T	P	C
Part II English II		COMMUNICATIVE ENGLISH	4	-	-	4
Pre-requisite		BASIC INTELLIGENCE ON WRITING	Syllabus Version		2020-2021	

Course Objectives:

The main objective of this course is to:

1. To train the students to develop the communication skills and inculcate language skills.

Expected Course Outcomes:

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

1	Understand basic grammar and enrich word power and language skill	K1, K2
2	Enhance the writing skill of the students to write flawlessly	K3
3	Write paragraphs, emails, letters, opinion pieces and dramatic scripts	K4
4	Enhance understanding various formal and informal, written and oral communicationsand respond to them	K5
5	Generate the own writing.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit:1		18hours

1. Listening and Speaking a. Listening and responding to complaints (formal situation) b. Listening to problems and offering solutions(informal) 2. Reading and writing a. Reading aloud (brief motivational anecdotes) b. Writing a paragraph on a proverbial expression/motivationalidea. 3. Word Power/Vocabulary a. Synonyms & Antonyms 4. Grammar in Context a. Adverbs b. Prepositions		
Unit:2		**20hours**
1. Listening and Speaking a. Listening to famous speeches and poems b. Making short speeches- Formal: welcome speech and vote ofthanks. Informal occasions- Farewell party, graduation speech 2. Reading and Writing a. Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic) b. Reading poetry b.i. Reading aloud: (Intonation and Voice Modulation) b.ii. Identifying and using figures ofspeech - simile, metaphor, personification etc. 3. Word Power a. Idioms & Phrases 4. Grammar in Context a. Conjunctions and Interjections		
Unit:3		**18hours**
1. Listening and Speaking a. Listening to Ted talks b. Making short presentations – Formal presentation with PPT, analytical presentationof graphs and reports of multiple kinds c. Interactions during and after the presentations 2. Reading and writing a. Writing emails of complaint b. Reading aloud famous speeches 3. Word Power a. One Word Substitution 4. Grammar in Context a. Sentence Patterns		
Unit:4		**16hours**
1. Listening and Speaking a. Participating in a meeting: face to face and online b. Listening with courtesy and adding ideas and givingopinions during the meeting and making concluding remarks. 2. Reading and Writing a. Reading visual texts – advertisements b. Preparing first drafts of short assignments 3. Word Power a. Denotation and Connotation 4. Grammar in Context: a. Sentence Types		
Unit:5		**18 hours**

1. Listening and Speaking a. Informal interview for feature writing b. Listening and responding to questions at aformal interview 2. Reading and Writing a. Writing letters of application b. Readers'Theatre (Script Reading) c. Dramatizing everyday situations/social issues through skits. (writing scripts and performing) 3. Word Power a. Collocation 4. Grammar in Context a. Working with Clauses		
	Total Lecture hours	**90hours**
Text Book(s)		
1	COMMUNICATIVE ENGLISH –TANSCHE	
Reference Books		

PART – III – CORE

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code		C++ PROGRAMMING	L	T	P	C
Core/Elective/Supportive		Core: 3	5	0	0	4
Pre-requisite		Before starting this course one should have a basic understanding of computer programs and computer programming language. If you know the concepts of C programming it will be much easier to understand this course	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. Impart knowledge of object oriented programming concepts and implement them in C++
2. Enable to differentiate procedure oriented and object-oriented concepts.
3. Equip with the knowledge of concept of Inheritance so that learner understands the need ofinheritance.
4. Explain the importance of data hiding in object oriented programming

Expected Course Outcomes:

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

1	Define the different programming paradigm such as procedure oriented and objectoriented programming methodology and conceptualize elements of OO methodology	K1
2	Illustrate and model real world objects and map it into programming objects for a legacy system.	K2
3	Identify the concepts of inheritance and its types and develop applications using overloading features.	K3
4	Discover the usage of pointers with classes	K4
5	Explain the usage of Files, templates and understand the importance of exceptionHandling	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION TO C++	10 hours

Key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures: - Decision Making and Statements: If.. Else, jump, goto, break, continue, Switch case statements - Loops in C++: for, while, do - functions in C++ - inline functions – Function Overloading..		
Unit:2	**CLASSES AND OBJECTS**	**10 hours**
Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.		
Unit:3	**OPERATOR OVERLOADING**	**12 hours**
Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.		
Unit:4	**POINTERS**	**13 hours**
Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators –dynamic object – Binding, Polymorphism and Virtual Functions.		
Unit:5	**FILES**	**13 hours**
File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializingstring objects – String Attributes – Miscellaneous functions .		
Unit:6	**Contemporary Issues**	**2 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Book(s)

1	Ashok N Kamthane, Object-Oriented Programming with Ansi And Turbo C++, PearsonEducation, 2003.

Reference Books

1	E. Balagurusamy, Object-Oriented Programming with C++, TMH, 1998.
2	Maria Litvin & Gray Litvin, C++ for you, Vikas publication, 2002.
3	John R Hubbard, Programming with C, 2nd Edition, TMH publication, 2002.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://www.spoken-tutorial.org
2	https://www.tutorialspoint.com/cplusplus/index.htm
3	https://www.w3schools.com/cpp/

Course Designed By:

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**PROGRAMMING LAB - C++**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Core Lab : 2**	**0**	**0**	**4**	**4**
Pre-requisite		Basic understanding of computer programs andcomputer programming language like C.	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. Impart knowledge of object oriented programming concepts and implement them in C++
2. Enable to differentiate procedure oriented and object-oriented concepts.
3. Equip with the knowledge of concept of Inheritance so that learner understands the need ofinheritance.
4. Explain the importance of data hiding in object oriented programming

Expected Course Outcomes:

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

1	Define the different programming paradigm such as procedure oriented and object oriented programming methodology and conceptualize elements of OO methodology	K1
2	Illustrate and model real world objects and map it into programming objects for alegacy system.	K2
3	Identify the concepts of inheritance and its types and develop applications usingoverloading features.	K3
4	Discover the usage of pointers with classes	K4
5	Explain the usage of Files, templates and understand the importance of exceptionHandling	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**
1. Write a C++ Program to create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH() to insert an element and member function POP() to delete an element check for overflow and underflow conditions..	
3. Write a C++ Program to read an integer number and find the sum of all the digits until it reducesto a single digit using constructors, destructors and inline member functions.	
4. Write a C++ Program to create a class FLOAT that contains one float data member. Overload allthe four Arithmetic operators so that they operate on the object FLOAT	

5. Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the operators ++ and == to concatenate two Strings and to compare two strings respectively.	
6. Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade	
7. Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.	
8. Write a C++ Program to create two classes each class consists of two private variables, a integer and a float variable. Write member functions to get and display them. Write a FRIEND Function common to both classes, which takes the object of above two classes as arguments and the integer and float values of both objects separately and display the result.	
9. Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.	
10. Write a C++ Program to check whether the given string is a palindrome or not using Pointers.	
11. Write a C++ Program to create a File and to display the contents of that file with line numbers.	
12. Write a C++ Program to merge two files into a single file.	
Text Book(s)	
1	Ashok N Kamthane, Object-Oriented Programming with Ansi And Turbo C++, PearsonEducation, 2003.
Reference Books	
1	E. Balagurusamy, Object-Oriented Programming with C++, TMH, 1998.
2	Maria Litvin & Gray Litvin, C++ for you, Vikas publication, 2002.
3	John R Hubbard, Programming with C, 2nd Edition, TMH publication, 2002.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
2	
4	
Course Designed By:	

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		Internet Basics	L	T	P	C
Core/Elective/ Supportive		Core Lab : 3	0	0	2	2
Pre-requisite		Knowledge of WINDOWS Operating Systems	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. Introduce the fundamentals of Internet and the Web functions.
2. Impart knowledge and essential skills necessary to use the internet and its various components.
3. Find, evaluate, and use online information resources.
4. Use Google Apps for education effectively.

Expected Course Outcomes:

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

1	Understand the fundamentals of Internet and the Web concepts	K2
2	Explain the usage of internet concepts and analyze its components.	K2
3	Identify and apply the online information resources	K3
4	Inspect and utilize the appropriate Google Apps for education effectively	K3, K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**
1. Create an email account in Gmail. Using the account created compose a mail to invite other college students for your college fest, enclose the invitation as attachment and send the mail to at least 50 recipients. Use CC and BCC options accordingly	
2. Open your inbox in the Gmail account created, check the mail received from your peer fromother college inviting you for his college fest, and download the invitation. Reply to the mail with a thank you note for the invite and forward the mail to other friends.	
3. Assume that you are studying in final year of your graduation and are eagerly looking fora job. Visit any job portal and upload your resume.	
4. Create a meeting using Google calendar and share meeting id to the attendees. Transfer the ownership to the Manager once the meeting id is	

generated.	
5. Create a label and upload bulk contacts using import option in Google Contacts	
6. Create your own Google classroom and invite all your friends through email id. Post study material in Google classroom using Google drive. Create a separate folder for every subject and upload all unit wise E-Content Materials.	
7. Create and share a folder in Google Drive using 'share a link' option and set the permission to access that folder by your friends only.	
8. Create one-page story in your mother tongue by using voice recognition facility of GoogleDocs.	
9. Create a registration form for your Department Seminar or Conference using GoogleForms.	
10. Create a question paper with multiple choice types of questions for a subject of yourchoice, using Google Forms.	
11. Create a Google form with minimum 25 questions to conduct a quiz and generate a certificate after submission.	
12. Create a meet using Google Calendar and record the meet using Google Meet.	
13. Create a Google slides for a topic and share the same with your friends.	
14. Create template for a seminar certificate using Google Slides.	
15. Create a sheet to illustrate simple mathematical calculations using Google Sheets.	
16. Create student's internal mark statement and share the Google sheets via link.	
17. Create different types of charts for a range in CIA mark statement using Google Sheets.	
18. Create a mark statement in Google Sheets and download it as PDF, .xls and .csv files	
Text Book(s)	
1	Ian Lamont, Google Drive & Docs in 30 Minutes, 2nd Edition.
2	
Reference Books	
1	Sherry Kinkoph Gunter, My Google Apps, 2014.
2	
3	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.youtube.com/watch?v=NzPNk44tdlQ
2	https://www.youtube.com/watch?v=PKuBtQuFa-8
4	https://www.youtube.com/watch?v=hGER1hP58ZE
Course Designed By:	

PART – III – ALLIED - II

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

ALLIED SUBJECT -2

DISCRETE MATHEMATICS

Subject Description: This subject deals with discrete structures like set theory, mathematical logic, relations, languages, graphs and trees.

Goal: To learn about the discrete structures for computer based applications.

Objective: On successful completion of this subject the students should have: - Understanding the concepts of discrete mathematics - Learning applications of discrete structures in Computer Science.

UNIT I:

Set theory-Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams- Set operations & Laws of set theory-Fundamental products-partitions ofets-minsets- Algebra of sets and Duality-Inclusion and Exclusion principle

UNIT II:

Mathematical logic – Introduction- prepositional calculus –Basic logical operations-Tautologies-Contradiction-Argument-Method o f proof- Predicate calculus.

UNIT III:

Relations – Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations – Functions – Types of functions – Invertible functions – Composition of functions.

UNIT IV:

Languages – Operations on languages – Regular Expressions and regular languages – Grammar – Types of grammars – Finite state machine – Finite – State automata

UNIT V:

Graph Theory – Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs – Representation of graphs in computer memory - Trees – Properties of trees – Binary trees – traversing Binary trees – Computer Representation of general trees.

TEXT BOOKS:

1. Discrete Mathematics, J.K. Sharma, 2nd edition, 2005, Macmillan India Ltd. (UNIT I TO V)

REFERENCE BOOKS:

1. Discrete Mathematics Structures with Applications to Computer Science, J. P. Tremblay, R Manohar, McGraw Hill International Edition

2. Discrete Mathematics, M. K. Venkataraman, N.Sridharan, N.Chandarasekaran, National Publishing Company, Chennai

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

UNIT – I :

Concept of Human Values, Value Education Towards Personal Development .Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education. Personal Development : Self analysis and introspection; sensitization towards gender equality, physically challenged, intellectually challenged. Respect to - age, experience, maturity, family members, neighbors, co-workers. Character Formation Towards Positive Personality: Truthfulness, Constructively, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision.

UNIT – II :

Value Education Towards National and Global Development National and International Values: Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom and fraternity. Social Values - Pity and probity, self control, universal brotherhood. Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith. Religious Values - Tolerance, wisdom, character. Aesthetic values - Love and appreciation of literature and fine arts and respect for the same. National Integration and international understanding.

UNIT – III :

Impact of Global Development on Ethics and Values Conflict of cross-cultural influences, mass media, cross-border education, materialistic values, professional challenges and compromise. Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality: Comparison and competition; positive and negative thoughts. Adolescent Emotions, arrogance, anger, sexual instability, selfishness, defiance.

UNIT - IV :

Therapeutic Measures Control of the mind through

a. Simplified physical exercise

b. Meditation – Objectives, types, effect on body, mind and soul

c. Yoga – Objectives, Types, Asana

d. Activities:

(i)Moralization of Desires

(ii)Neutralization of Anger

(iii)Eradication of Worries

(iv)Benefits of Blessings

UNIT V :

Human Rights

1. Concept of Human Rights – Indian and International Perspectives

a. Evolution of Human Rights

b. Definitions under Indian and International documents

2. Broad classification of Human Rights and Relevant Constitutional Provisions.

a. Right to Life, Liberty and Dignity

b. Right to Equality

c. Right against Exploitation

d. Cultural and Educational Rights

e. Economic Rights

f. Political Rights

g. Social Rights

3. Human Rights of Women and Children

a. Social Practice and Constitutional Safeguards

(i) Female Feticide and Infanticide

(ii) Physical assault and harassment

(iii) Domestic violence

(iv) Conditions of Working Women

4. Institutions for Implementation

a. Human Rights Commission

b. Judiciary

5. Violations and Redressed

a. Violation by State

b. Violation by Individuals

c. Nuclear Weapons and terrorism d. Safeguards.

Third Semester

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SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER - III

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
THIRD SEMESTER							
	Core 4: Data Structures	4	6		25	75	100
	Core 5: Java Programming	4	6		25	75	100
	Core Lab 4: Programming Lab – Java	4		5	25	75	100
	Allied 3: Computer Based Optimization Techniques	4	6		25	75	100
	Skill based Subject 1 : Software Engineering and Software Project Management	3	5		20	55	75
	Tamil @/ Advanced Tamil (OR) Non-major elective-1 (Yoga for Human Excellence)# / Women's Rights#	2	2		-	50	50
Total		**Total**	**21**	**25**	**5**	**120**	**405**

PART – III – CORE

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code		Data Structures	L	T	P	C
Core/Elective/ Supportive		Core: 4	6	0	0	4
Pre-requisite		Basic understanding of Data storage, retrievaland algorithms.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To introduce the fundamental concept of data structures
2. To emphasize the importance of data structures in developing and implementing efficientalgorithms.
3. Understand the need for Data Structures when building application
4. Ability to calculate and measure efficiency of code
5. Improve programming logic skills.

Expected Course Outcomes:

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

1	Understand the basic concepts of data structures and algorithms	K1-K2
2	Construct and analyze of stack and queue operations with illustrations	K2-K4
3	Enhance the knowledge of Linked List and dynamic storage management.	K2-K3
4	Demonstrate the concept of trees and its applications	K2-K3
5	Design and implement various sorting and searching algorithmsfor applications and understand the concept of file organizations	K1-K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION	15 hours

Introduction of Algorithms, Analysing Algorithms. Arrays: Sparse Matrices - Representation of Arrays. Stacks and Queues. Fundamentals - Evaluation of Expression Infix to Postfix Conversion - Multiple Stacks and Queues

Unit:2	LINKED LIST	12 hours

Linked List: Singly Linked List - Linked Stacks and Queues - Polynomial Addition- More on Linked Lists - Sparse Matrices - Doubly Linked List and Dynamic – Storage Management - Garbage Collection and Compaction.

Unit:3	TREES	15 hours
Basic Terminology - Binary Trees - Binary Tree Representations – Binary Trees-Traversal-More On Binary Trees – Threaded Binary Trees - Binary Tree. Representation of Trees - Counting Binary Trees. Graphs: Terminology and Representations-Traversals, Connected Components and Spanning Trees, Shortest Paths and Transitive Closure		
Unit:4	**EXTERNAL SORTING**	**15 hours**
Storage Devices -Sorting with Disks: K-Way Merging – Sorting with Tapes Symbol Tables: Static Tree Tables - Dynamic Tree Tables - Hash Tables: Hashing Functions - Overflow Handling.		
Unit:5	**INTERNAL SORTING**	**15 hours**
Insertion Sort - Quick Sort - 2 Way Merge Sort - Heap Sort – Shell Sort - Sorting on Several Keys. Files: Files, Queries and Sequential organizations – Index Techniques -File Organizations.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

	Text Book(s)
1	Ellis Horowitz, Sartaj Shani, Data Structures, Galgotia Publication.
2	Ellis Horowitz, Sartaj Shani, Sanguthevar Rajasekaran, Computer Algorithms, GalgotiaPublication.
3	S.Lovelyn Rose, R.Venkatesan, Data Structures, Wiley India Private Limited,2015, 1st Edition

	Reference Books
1	Jean-Paul,Tremblay & Paul G.Sorenson , An Introduction to Data structures with ApplicationsTata McGraw Hill Company 2008, 2ndEdition.
2	Samanta.D , Classic Data Structure Prentice Hall of India Pvt Ltd 2007, 9th Edition
3	Seymour Lipschutz, Data Structures McGraw Hill Publications, 2014, 1st Edition

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	
2	
3	

Course Designed By:

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		Java Programming	L	T	P	C
Core/Elective/Supportive		Core: 5	6	0	0	4
Pre-requisite		The objective of the course is to train the studentsto acquire problem-solving skills through object oriented programming	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To expose the students with the introduction to OOPs and advantages of object orientedprogramming.
2. The concepts of OOPs make it easy to represent real world entities.
3. The course introduces the concepts of converting the real time problems into objects andmethods and their interaction with one another to attain a solution.
4. Simultaneously it provides the syntax of programming language Java for solving the realworld problems.

Expected Course Outcomes:

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

1	The competence and the development of small to medium sized application programs that demonstrate professionally acceptable coding	K1-K2
2	Demonstrate the concept of object oriented programming through Java	K2-K4
3	Apply the concept of Inheritance, Modularity, Concurrency, Exceptions handling and data persistence to develop java program	K3
4	Develop java programs for applets and graphics programming	K3
5	Understand the fundamental concepts of AWT controls, layouts andevents	K1-K2

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING	15 hours

Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming –Application of Object-Oriented Programming. Java Evolution: History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine.

Unit:2	BRANCHING AND LOOPING	12 hours
Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: if, if...else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops – Classes, Objects and Methods.		
Unit:3	**ARRAYS AND INTERFACES**	**15 hours**
Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting Classestogether – Multithreaded Programming.		
Unit:4	**ERROR HANDLING**	**15 hours**
Managing Errors and Exceptions – Applet Programming – Graphics Programming.		
Unit:5	**MANAGING INPUT / OUTPUT FILES IN JAVA**	**15 hours**
Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

	Text Book(s)
1	Programming with Java – A Primer - E. Balagurusamy, 5th Edition, TMH.
2	Herbert Schildt , Java: The Complete Reference, McGraw Hill Education, Oracle Press 10thEdition, 2018
3	Programming with Java – A Primer - E. Balagurusamy, 3rd Edition, TMH.
	Reference Books
1	The Complete Reference Java 2 - Patrick Naughton & Hebert Schildt, 3rd Edition, TMH
2	Programming with Java – John R. Hubbard, 2nd Edition, TMH.
	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	www.spoken-tutorial.org
2	www.nptel.ac.in
3	https://www.w3schools.in/java-tutorial/
	Course Designed By:

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		Programming Lab – JAVA	L	T	P	C
Core/Elective/Supportive		Core Lab: 4	0	0	5	4
Pre-requisite		Students should know about the OOPs conceptand basic knowledge in java theory.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

3. The main objective of JAVA Programming Lab is to provide the students a strong foundationon programming concepts and its applications through hands-on training.
4. To practice the Basic concepts, Branching and Looping Statements and Strings in Cprogramming
5. To implement and gain knowledge in Arrays, functions, Structures, Pointers and File handling

Expected Course Outcomes:

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

1	Understand the basic concepts of Java Programming with emphasis on ethics andprinciples of professional coding	**K1, K2**
2	Demonstrate the creation of objects, classes and methods and the concepts of constructor, methods overloading, Arrays, branchingand looping	**K2**
3	Create data files and Design a page using AWT controls and Mouse Events in Java programming Implement the concepts of code reusability and debugging.	**K2, K3**
4	Develop applications using Strings, Interfaces and Packages and applets	**K3**
5	Construct Java programs using Multithreaded Programming andException Handling	**K3**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**

1. Write a Java Applications to extract a portion of a character string and print the extractedstring.
2. Write a Java Program to implement the concept of multiple inheritance using Interfaces.

3. Write a Java Program to create an Exception called payout-of-bounds and throw the exception.		
4. Write a Java Program to implement the concept of multithreading with the use of any threemultiplication tables and assign three different priorities to them.		
5. Write a Java Program to draw several shapes in the created windows.		
6. Write a Java Program to create a frame with four text fields name, street, city and pin code with suitable tables. Also add a button called my details. When the button is clicked its corresponding values are to be appeared in the text fields.		
7. Write a Java Program to demonstrate the Multiple Selection List-box.		
8. Write a Java Program to create a frame with three text fields for name, age and qualificationand a text field for multiple line for address		
9. Write a Java Program to create Menu Bars and pull down menus.		
10. Write a Java Program to create frames which respond to the mouse clicks. For each events with mouse such as mouse up, mouse down, etc., the corresponding message to be		
displayed.		
11. Write a Java Program to draw circle, square, ellipse and rectangle at the mouse click positions.		
12. Write a Java Program which open an existing file and append text to that file.		
	Total Lecture hours	**36 hours**
Text Book(s)		
1	Programming with Java – A Primer – E. Balagurusamy, 5th Edition, TMH.	
2	Herbert Schildt , Java: The Complete Reference, McGraw Hill Education, Oracle Press 10thEdition, 2018	
3	Programming with Java – A Primer – E. Balagurusamy, 3rd Edition, TMH.	
Reference Books		
1	The Complete Reference Java 2 – Patrick Naughton & Hebert Schildt, 3rd Edition, TMH	
2	Programming with Java – John R. Hubbard, 2nd Edition, TMH.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	https://www.w3resource.com/java-exercises/	
2	https://www.udemy.com/introduction-to-java-programming/	
3		
Course Designed By:		

SKILL BASED SUBJECT- I

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Software Engineering and Software ProjectManagement**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Skill based Subject - 1**	**5**	**0**	**0**	**3**
Pre-requisite		**Basic knowledge on the Software DevelopmentLife Cycle.**	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To enhance the basic software engineering methods and practices.
2. To learn the techniques for developing software systems.
3. To understand the object oriented design.
4. To understand software testing approaches

Expected Course Outcomes:

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

1	Understand the basic concepts of software engineering	K1
2	Apply the software engineering models in developing software applications	K2-K3
3	Implement the object oriented design in various projects	K4
4	Knowledge on how to do a software project with in-depth analysis.	K3
5	To inculcate knowledge on Software engineering concepts in turn gives aroadmap to design a new software project.	K1-K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**SOFTWARE ENGINEERING**	**15 hours**

Software Engineering: A Layered Technology – Software Process – Software Process Models – The Prototyping. Requirement Engineering– Software prototyping - Elements of analysis model –Data modeling – Functional modeling and information flow.

Unit:2	**SOFTWARE DESIGN**	**12 hours**

Software design and Software engineering – The Design process – Design principles – Designconcepts – Effective modular design –Software Architecture

Unit:3	**SOFTWARE TESTING**	**15 hours**

Software testing fundamentals – Test Case Design - White box testing – Basis path testing –Control structure testing – Black box testing. Unit testing – Validation testing – System testing.

Unit:4	SOFTWARE CONFIGURATION MANAGEMENT	15 hours
Software Configuration Management: Definitions and terminology – processes and activities. Software Quality assurance: Definitions – Quality control and Quality assurance – Organization of Structures. Risk Management: Risk Identification – quantification - Monitoring - Mitigation. Software requirements gathering: Steps to be followed – Outputs and Quality Records - Skill sets required – Challenges.		
Unit:5	**ESTIMATION**	**15 hours**
Estimation: What is Estimation? – When and Why? – Three phases of Estimation – Estimation methodology – Formal models of Size Estimation. Design and Development phases: Reusability -Technology choices – Standards – Portability -User interface issues – Testability - The Effect of Internet on Project Management.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	Roger S. Pressman: Software Engineering, Tata McGraw Hill, V Edition.
2	Gopalaswamy Ramesh, Managing Global Software Projects, Tata McGraw Hill, New Delhi,2002.
3	Programming with Java – A Primer - E. Balagurusamy, 3rd Edition, TMH.
Reference Books	
1	The Complete Reference Java 2 – Patrick Naughton & Hebert Schildt, 3rd Edition, TMH
2	Programming with Java – John R. Hubbard, 2nd Edition, TMH.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
2	
3	
Course Designed By:	

PART- III – ALLIED - III

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

ALLIED SUBJECT - 3

COMPUTER BASED OPTIMIZATION TECHNIQUES

Subject Description: This subject deals various optimization techniques for linear programming, Transportation, Assignment Problems, Game theory, PERT and CPM.

Goal: To learn about the managerial concepts like decision making, optimization, etc.

Objective: On successful completion of this subject the students should have:

- Understanding various mathematical applications in industries.
- Decision making for real time environment.

UNIT I:

Linear Programming - Mathematical Model assumption of linear Programming – Graphical method - Principles of Simplex method, Big-M Method, Duality, Dual simplex method.

UNIT II:

Transportation and Assignment problem - Integer Programming Branch and Round Techniques - Assignment and Traveling Salesman Problem.

UNIT III:

Game Theory - Concept of Pure and Mixed Strategies – Solving 2 x 2 matrix with and without saddle point - n x 2 - 2 x m games. Replacement models - Elementary replacement models - present value - rate of return - depreciation - Individual replacement –Group replacement.

UNIT IV:

(Derivations not included) Queuing Theory - definition of waiting line model - Queue discipline - traffic intensity - poison arrival – Birth death process - Problem from single server: finite and infinite population model – Problems from multi server: finite and infinite population model.

UNIT V:

PERT & CPM - Network representation - backward pass - Forward pass -

computation - Pert Network - Probability factor – updating and Crashing.

TEXT BOOK:

1. Operations Research, Manmohan, P.K. Gupta, Kanthiswarup, S. Chand & Sons - 1997.

REFERENCE BOOKS:

1. Operations Research, Hamdy A Taha, Pearson Education, 7th edition, 2002
2. Problems in Operations Research, P.K. Gupta, D.S. Hira, S. Chand Publishers.

ADVANCE TAMIL

Part-IV Tamil/Special Tamil wef 2012-13 Annexure 13D
SCAA DT. 11-5-2012

பாரதியார் பல்கலைக்கழகம் : கோயமுத்தூர்
பகுதி – IV: தமிழ்த் தாள் - 1 - முன்றாம் பருவம்
இளங்கலை 2012-13 கல்வி ஆண்டுமுதல் சேர்வோர்க்குரியது
(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)
அக மதிப்பீட்டுத் தேர்வு மட்டும் - பல்கலைக்கழக எழுத்துத் தேர்வுகள் கிடையாது

1. தமிழ் மொழியின் அடிப்படைக் கூறுகள்.
   எழுத்துகள் : முதலெழுத்துகள் (உயிர் எழுத்து, மெய் எழுத்து, உயிர்மெய் எழுத்து)
   சொற்கள் : வகைகள் (பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்)
   தொடர் : தொடரமைப்பு (எழுவாய், செயப்படுபொருள், பயனிலை)
2. குறிப்பு எழுதுதல் : பத்துப் பதினைந்து தொடர்களில் குறிப்பு வரைதல்
   பிழைதீக்கி எழுதுதல் : (ஒற்றுப்பிழை, எழுத்துப்பிழை)

2012-2013 கல்வியாண்டு முதல் பயில்பவர்களுக்குப் பின்வரும் வினாத்தாள் அமைப்பு பின்பற்றப்பட வேண்டும்.

	அக மதிப்பீட்டுத் தேர்வு மதிப்பெண் வழங்கும் முறை	மதிப்பெண்கள்
1.	வகுப்புத் தேர்வு-1	10
2.	வகுப்புத் தேர்வு-2	10
3.	மாதிரித் தேர்வு	10
4	பயிற்சிக் கட்டுரை	10
5	வாய்மொழித் தேர்வு	10
	மொத்த மதிப்பெண்கள்	50

குறிப்பு : வாய்மொழித் தேர்வில் தமிழ்ச் செம்மொழி வரலாறு தொடர்பான வினாக்கள் மட்டுமே கேட்கப்பட வேண்டும்.

WOMENS RIGHTS

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2015-2016 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SYLLABUS FOR "Women's Rights

FOR PART – IV IN THIRD SEMESTER OF UNDERGRADUATE CANDIDATES

WITH EFFECT FROM 2008-09

UNIT I

Laws, Legal Systems and Change Definition - Constitutional law, CEDAW and International Human Rights – Laws and Norms – Laws and Social Context – Constitutional and Legal Framework.

UNIT II

Politics of land and gender in India Introduction – Faces of Poverty – Land as Productive Resources – Locating Identities – Women's Claims to Land – Right to Property - Case Studies.

UNIT III

Women's Rights: Access to Justice: Introduction – Criminal Law – Crime Against Women – Domestic Violence – Dowry Related Harassment and Dowry Deaths – Molestation – Sexual Abuse and Rape – Loopholes in Practice – Law Enforcement Agency.

UNIT IV

Women's Rights :Violence Against Women – Domestic Violence - The Protection of Women from Domestic Violence Act, 2005 - The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961.

UNIT V

Special Women Welfare Laws ,Sexual Harassment at Work Places – Rape and Indecent Representation – The Indecedent Representation (Prohibition) Act, 1986 - Immoral Trafficking – The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment - Role of Rape Crisis Centers.

REFERENCES :

1.Nitya Rao “Good Women do not Inherit Land” Social Science Press and Orient Blackswan 2008

2.International Solidarity Network “Knowing Our Rights” An imprint of Kali for Women 2006.

3.P.D.Kaushik “Women Rights” Bookwell Publication 2007.

4.Aruna Goal “Violence Protective Measures for Women Development and Empowerment” Deep and Deep Publications Pvt 2004.

5.Monica Chawla “Gender Justice” Deep and Deep Publications Pvt Ltd.2006.

6.Preeti Mishra “Domestic Violence Against Women” Deep and Deep Publications Pvt 2007.

7.ClairM.Renzetti, Jeffrey L.Edleson, Raquel Kennedy Bergen, Source Book on “Violence Against Women” Sage Publications 2001.

YOGA FOR HUMAN EXCELLENCE

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COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2015-2016 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SYLLABUS FOR "Women's Rights

FOR PART – IV IN THIRD SEMESTER OF UNDERGRADUATE CANDIDATES

WITH EFFECT FROM 2008-09

Unit I - Yoga and Physical Health

1.1 Physical Structure – Three bodies – Five limitations

1.2 Simplified Physical Exercises – Hand Exercises -Leg Exercises – Breathing Exercises – Eye Exercises – Kapalapathi

1.3 Maharasanas 1-2 – Massages – Acu-puncture – Relaxation

1.4 Yogasanas – [illegible] – Padmasana – Vajrasanas – Chakrasanas (Side) – Viruchasanas – Yoga muthra – Patchimothasanas – Ustrasanas – Vakkarasanas – Salabasanas

Unit II - Art of Nurturing the life force and Mind

2.1 Maintaining the youthfulness – Postponing the ageing process

2.2 Sex and Spirituality - Significance of sexual vital fluid – Married life – Chastity

2.3 Ten stages of Mind

2.4 Mental frequency – Methods for concentration

Unit III - Sublimation

3.1 Purpose and Philosophy of life

3.2 Introspection – Analysis of Thought

3.3 Moralization of Desires

3.4 Neutralization of Anger

Unit IV – Human Resources Development

4.1 Eradication of worries

4.2 Benefits of Blessings

4.3. Greatness of Friendship

4.4 Individual Peace and World Peace

Unit V – Law of Nature

5.1 Unified force – Cause and Effect system

5.2 Purity of Thought and Deed and Genetic Centre

5.3 Love and Compassion

5.4 Cultural Education – Five fold Culture

2

CONSTITUTION OF INDIA

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2015-2016 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

NON-MAJOR ELECTIVE CONSTITUTION OF INDIA

UNIT I

Making of Constitution - Constituent Assembly - Dr.Rajendra Prasath - Dr.B.R.Ambedkar - Salient features - Fundamental Rights.

UNIT II

Union Executive - President of India - Vice-President - Prime Minister - Cabinet - Functions

UNIT III

Union Legislature - Rajiya Sabha - Lok Sabha - Functions and Powers

UNIT IV

Union Judiciary - Supreme Court - Functions - Rule of law

UNIT V

State - Executive - Legislature - Judiciary

Books for Reference:

1.Agharwal.R.C. - National Moment and Constitutional Development - New Delhi, 1977

2.Chapra B.R., Constitution of India, New Delhi, 1970

3.Rao B.V., Modern Indian Constitution, Hyderabad, 1975.

4.Nani Palkhivala - Constitution of India, New Delhi, 1970

5.Krishna Iyer, V.R., Law and Justice, New Delhi, 2009

Fourth Semester

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER - IV

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
FOURTH SEMESTER							
	Core 6: System Software and Operating System	4	6		25	75	100
	Core 7: Linux and Shell Programming	4	6		25	75	100
	Core Lab 5: Linux and Shell Programming Lab	4		6	40	60	100
	Allied 4: Business Accounting	4	6		25	75	100
	Skill based subject 2 (lab) : Software Project Management-Lab	3	4		30	45	75
	Tamil @/ Advanced Tamil (OR) Non-major elective-II (General Awareness) #	2	2		-	50	50
	Total	**21**	**24**	**6**	**145**	**380**	**525**

PART – III – CORE

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		System Software and Operating Systems	L	T	P	C
Core/Elective/Supportive		Core : 6	6	0	0	4
Pre-requisite		Students Should have the basic knowledge incomputer.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To understand the processing of programs on a computer system to design and implementationof language processor.
2. To enhance the ability of program generation through expansion and gain knowledge aboutCode optimization using software tools.
3. Students will gain knowledge of basic operating system concepts.
4. To have an in-depth understanding of process concepts, deadlock and memory management.
5. To provide an exposure to scheduling algorithms, devices and information management.

Expected Course Outcomes:

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

1	Know the program generation and program execution activities in detail	K1
2	Understand the concepts of Macro Expansions and Gain the knowledge of Editing processes	K2-K3
3	Remember the basic concepts of operating system	K1
4	Understand the concepts like interrupts, deadlock , memory management and filemanagement	K2
5	Analyze the need for scheduling algorithms and implement different algorithms used for representation, scheduling, and allocation in DOS and UNIX operatingsystem.	K1-K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION TO SYSTEM SOFTWARE	12 hours

Introduction–System Software and machine architecture. Loader and Linkers: Basic Loader Functions - Machine dependent loader features –Machine independent loader features - Loader design options

Unit:2	MACHINE AND COMPILER	15 hours

Machine dependent compiler features - Intermediate form of the program - Machine dependentcode optimization - Machine independent compiler features - Compiler design options – Division into passes – Interpreters – p-code compilers - Compiler-compilers.		
Unit:3	**OPERATING SYSTEM**	**15 hours**
What is an Operating System? – Process Concepts: Definition of Process - Process States - Process States Transition – Interrupt Processing – Interrupt Classes - Storage Management: Real Storage: Real Storage Management Strategies – Contiguous versus Non-contiguous storage allocation – Single User Contiguous Storage allocation- Fixed partition multiprogramming – Variable partition multiprogramming.		
Unit:4	**VIRTUAL STORAGE**	**15 hours**
Virtual Storage: Virtual Storage Management Strategies – Page Replacement Strategies – Working Sets – Demand Paging – Page Size. Processor Management: Job and Processor Scheduling: Preemptive Vs Non-preemptive scheduling – Priorities – Deadline scheduling.		
Unit:5	**DEVICE AND INFORMATION MANAGEMENT**	**15 hours**
Device and Information Management Disk Performance Optimization: Operation of moving head disk storage – Need for disk scheduling – Seek Optimization – File and Database Systems: File System – Functions – Organization – Allocating and freeing space – File descriptor – Access control matrix.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)

1	Leland L.Beck, System Software: An Introduction to Systems Programming, Pearson, ThirdEdition.
2	H.M. Deitel, Operating Systems, 2nd Edition, Perason, 2003.

Reference Books

1	Achy8ut S. Godbole, Operating Systems, TMH, 2002.
2	John J. Donovan, Systems Programming, TMH, 1991.
3	D.M. Dhamdhere, Systems Programming and Operating Systems, 2nd Revised Edition, TMH.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	
2	
3	

Course Designed By:

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Linux and Shell Programming**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Core : 7**	**6**	**0**	**0**	**4**
Pre-requisite		Before starting the course students should have the basic knowledge about operating system and C programming.	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. Linux is a multi-user and multi-tasking operating system and after learning the concepts of anoperating system
2. Student will be able to write simple shell programming using Linux utilities, pipes and filters.
3. The file system, process management and memory management are discussed.
4. Various commands used by Linux shell is also discussed which makes the users to interactwith each other.
5. Bourne shell programming is dealt in depth which can be used to develop applications.

Expected Course Outcomes:

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

1	Describe the architecture and features of Linux Operating System and distinguish itfrom other Operating System.	K1
2	Develop Linux utilities to perform File processing, Directory handling, User Management and display system configuration	K2-K3
3	Develop shell scripts using pipes, redirection, filters and Pipes	K2
4	Apply and change the ownership and file permissions using advance Unixcommands.	K3
5	Build Regular expression to perform pattern matching using utilities andimplement shell scripts for real time applications.	K3-K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**INTRODUCTION**	**12 hours**

Introduction to LINUX Operating System: Introduction - The LINUX Operating System.

Unit:2	**MANAGING FILES AND DIRECTORIES**	**15 hours**

Managing Files and Directories: Introduction – Directory Commands in LINUX – File Commandsin LINUX.

Unit:3	**VI EDITOR**	**15 hours**
Creating files using the vi editor: Text editors – The vi editor. Managing Documents: Locatingfiles in LINUX – Standard files – Redirection – Filters – Pipes.		
Unit:4	**SECURING FILES**	**15 hours**
Securing files in LINUX: File access permissions – viewing File access permissions – Changing File access permissions. Automating Tasks using Shell Scripts: Introduction – Variables- Local and Global Shell variables – Command Substitution.		
Unit:5	**CONDITIONAL EXECUTION IN SHELL SCRIPTS**	**15 hours**
Using Conditional Execution in Shell Scripts: Conditional Execution – The case…esac Construct.Managing repetitive tasks using Shell Scripts: Using Iteration in Shell Scripts – The while construct – until construct – for construct – break and continue commands – Simple Programs using Shell Scripts.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

	Text Book(s)
1	Operating System LINUX, NIIT, PHI, 2006, Eastern Economy Edition.
2	N.B. Venkateswarlu , Introduction to Linux: Installation and Programming, BS Publications,2008, 1st Edition
	Reference Books
1	Richard Petersen, Linux: The Complete Reference, Sixth Edition, Tata McGraw-HillPublishing Company Limited, New Delhi, Edition 2008.
	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]
1	http://spoken-tutorial.org/
2	https://www.tutorialspoint.com/linux/index.htm
3	

Course Designed By:

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Programming Lab – LINUX and SHELL PROGRAMMING**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Core Lab: 5**	**0**	**0**	**6**	**4**
Pre-requisite		Students should have the prior basic knowledgein operating system.	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. Describe the architecture and features of Linux Operating System
2. To create programs in the Linux environment using Linux utilities and commands.
3. Student is given an introduction of Linux shell commands and they will be able to write ownshell scripts.
4. Shell programming is dealt in depth which can be used to develop applications.

Expected Course Outcomes:

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

1	Develop Linux utilities to perform File processing, Directory handling and UserManagement	**K1, K2**
2	Understand and develop shell scripts using pipes, redirection, filters, Pipes anddisplay system configuration	**K2-K3**
3	Develop simple shell scripts applicable to file access permission networkadministration	**K3**
4	Apply and change the ownership and file permissions using advance Unixcommands.	**K4-K5**
5	Create shell scripts for real time applications.	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**

1. Write a shell script to stimulate the file commands: rm, cp, cat, mv, cmp, wc, split, diff.
2. Write a shell script to show the following system configuration :
   a. currently logged user and his log name
   b. current shell , home directory , Operating System type , current Path setting , currentworking directory
   c. show currently logged number of users, show all available shells
   d. show CPU information like processor type , speed
   e. show memory information
3. Write a Shell Script to implement the following: pipes, Redirection and tee commands.

4. Write a shell script for displaying current date, user name, file listing and directories bygetting user choice.		
5. Write a shell script to implement the filter commands.		
6. Write a shell script to remove the files which has file size as zero bytes.		
7. Write a shell script to find the sum of the individual digits of a given number.		
8. Write a shell script to find the greatest among the given set of numbers using command lineargumenta.		
9. Write a shell script for palindrome checking.		
10. Write a shell script to print the multiplication table of the given argument using for loop.		
	Total Lecture hours	**36 hours**
Text Book(s)		
1	Operating System LINUX, NIIT, PHI, 2006, Eastern Economy Edition.	
2	N.B. Venkateswarlu , Introduction to Linux: Installation and Programming, BS Publications,2008, 1st Edition	
Reference Books		
1	Richard Petersen, Linux: The Complete Reference, Sixth Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, Edition 2008.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	https://www.w3resource.com/linux-exercises/	
2	http://spoken-tutorial.org/	
3		
Course Designed By:		

SKILL BASED SUBJECT - II

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Lab – Software Project Management**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Skill Based Subject 2 (Lab) :1**	**0**	**0**	**4**	**3**
Pre-requisite		**Basic knowledge in SDLC and managing ofsoftware projects**	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To gain knowledge about how to develop project plan
2. To create requirement analysis and specification for software applications.
3. Student is given an introduction of various phases of software development life cycle models.
4. To analyze the steps are to be implemented using SDLC to develop applications.

Expected Course Outcomes:

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

1	Prepare a Project Plan with requirement analysis and specification.	**K1, K2**
2	Understand and develop cost estimation model for real time applications.	**K2-K3**
3	Implement the concepts of checkpoints in design phase	**K3**
4	Analyze the Development phase of the database and text area of theapplications.	**K4-K5**
5	Create SDLC for real time applications.	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**
1. Preparation of Project Management Plan.	
2. Using any of the CASE tools, Practice requirement analysis and specification for differentfirms.	
3. Case study of cost estimation models.	
4. Practice object oriented design principles for implementation.	
5. Practice function oriented design.	
6. Practice creating software documentation for the Analysis phase of software developmentlife cycle for a real time application.	
7. Practice creating software documentation for the Development phase of softwaredevelopment life cycle for a real time application.	

8. Practice creating software documentation for the Implementation phase of softwaredevelopment life cycle for a real time application.		
9. Practice creating software documentation for the Testing phase of software developmentlife cycle for a real time application.		
10. Simulate a tool for path testing principles.		
11. Simulate a tool for testing based on control structures.		
12. Simulate a tool that reflects black box testing concepts		
	Total Lecture hours	**36 hours**
Text Book(s)		
1		
Reference Books		
1		

PART – III – ALLIED – IV

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

ALLIED – 4 - BUSINESS ACCOUNTING

UNIT I:

Introduction-Accounting Principles-Branches of accounting-accounting rules-Journalising-Ledger-Subsidiary Book including cash books-Trial Balance.

UNIT II:

Preparation of Final Accounts: Trading, Profit and Loss Account and Balance sheet with simple adjustments-Outstanding Expenses and Income, Prepaid Expenses, Pre received Income, Depreciation –Provision for bad debts.

UNIT III:

Cost Account-Meaning elements of cost-Preparation of cost sheet with simple adjustments.

UNIT IV:

Material cost: Stores Ledger-FIFO-LIFO-weighted average, simple average method. Management Account-Meaning –Objectives- Management account with financial Account.

UNIT V:

Budget and Budgetary control-Preparation of various budgets-Flexible Budget-Production Budget-Cash Budget – Sales Budget.

Note: Distribution of Marks between Problems and Theory shall be 60% and 40%.

TEXT BOOK:

1. Accounting for Management, N.P.Srinivasan and M.Sakthivel Murugan, S.Chand & Company Ltd., New Delhi.

REFERENCE BOOKS:

1. Double entry book Keeping, T.S Grewal, Sultan Chand & Sons, New Delhi.

2. Management Accounting, Sharma and Gupta, Kalyani Publishers, New Delhi.

NON-MAJOR ELECTIVE – II

ADVANCED TAMIL

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2016-2017 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

பாரதியார் பல்கலைக்கழகம் : கோயமுத்தூர்

பகுதி - IV : சிறப்புத் தமிழ் தாள் - 2

நான்காம் பருவம்

இளங்கலை 2012-13 கல்வி ஆண்டுமுதல் சேர்வோர்க்குரியது

(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு)

கூறு - 1 திருக்குறள் - ஒழிபியலில் முதல் 5 அதிகாரங்கள் மட்டும்

கூறு - 2 உரைநடை : (கட்டுரை)
(இளைஞர்களின் ஒளிமயமான எதிர்காலத்திற்கு
கு.வே.பாலசுப்பிரமணியம், அனுராதா ஏஜென்ஸிஸ்
கும்பகோணம். தொலைபேசி : 04366-262237, 263237

கூறு - 3 எழுத்துப்பிழை நீக்க வழிகள் - பிழையும் திருத்தமும்
சொற்களைச் சரியாகப் பயன்படுத்தும் பாங்கு - வினைச் சொற்கள்
துணை வினைகள் (எடுத்துகாட்டுகளுடன் விளக்குதல்).

கூறு - 4 வழக்கறிதல் : மரபு வழக்கு - இயல்பு வழக்கு - தகுதி வழக்கு அறிதல்

கூறு - 5 படைப்பாற்றல் பயிற்சி
கட்டுரைகள் எழுதுதல்

GENERAL AWARENESS

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2016-2017 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER IV : NON MAJOR ELECTIVE : GENERAL AWARENESS

1. VERBAL APTITUDE
2. NUMERICAL APTITUDE
3. ABSTRACT REASONING
4. TAMIL AND OTHER LITERATURE
5. GENERAL SCIENCE AND TECHNOLOGY AND EDUCATION
6. COMPUTER SCIENCE
7. ECONOMICS AND COMMERCE
8. HISTORY AND FREEDOM STRUGGLE
9. SPORTS
10. CURRENT AFFAIRS
11. MODEL QUESTION PAPER

Fifth Semester

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER – V

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
FIFTH SEMESTER							
	Core 8: RDBMS & Oracle	4	6		25	75	100
	Core 9: Visual Basic	4	6		25	75	100
	Core Lab 6: Programming Lab – VB & Oracle	4		6	40	60	100
	Elective-I PYTHON Programming/ Computer Networks / Organizational Behavior	4	6		25	75	100
	Skill based Subject 3: SoftwareTesting	3	6		20	55	75
Total		**Total**	**19**	**24**	**6**	**135**	**340**

PART – III – CORE

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		RDBMS & Oracle	L	T	P	C
Core/Elective/Supportive		Core : 8	6	0	0	4
Pre-requisite		Basic knowledge about the data, table and database in computers	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. The course describes the data, organizing the data in database, database administration.
2. To grasp the different issues involved in the design of a database system.
3. To study the physical and logical database designs and database modeling like relational, Hierarchical, network models, database security, integrity and normalization.
4. It also gives introduction to SQL language to retrieve the data from the database with suitableapplication development.
5. Provide strong foundation of database concepts and to introduce students to applicationdevelopment in DBMS.

Expected Course Outcomes:

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

1	Understand the basic concepts of Relational Data Model, Entity-Relationship Model and process of Normalization	**K1-K2**
2	Understand and construct database using Structured Query Language(SQL) in Oracle9i environment.	**K1-K3**
3	Learn basics of PL/SQL and develop programs using Cursors, Exceptions, Procedures and Functions.	**K1-K4**
4	Understand and use built-in functions and enhance the knowledge ofhandling multiple tables	**K1-K3**
5	Attain a good practical skill of managing and retrieving of data usingData Manipulation Language (DML)	**K2-K4**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	DATABASE CONCEPTS	15 hours

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De -normalization – Another Example of Normalization.

Unit:2	**ORACLE9i**	**15 hours**
Oracle9*i*: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - *i*SQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.		
Unit:3	**WORKING WITH TABLE**	**15 hours**
Working with Table: Data Management and Retrieval: DML – adding a new Row/Record –Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from		
Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations.		
Unit:4	**PL/SQL**	**15 hours**
PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.		
Unit:5	**PL/SQL COMPOSITE DATA TYPES**	**12 hours**
PL/SQL Composite Data Types: Records – Tables – arrays. Named Blocks: Procedures –Functions – Packages –Triggers –Data Dictionary Views.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

	Text Book(s)
1	Database Systems using Oracle, Nilesh Shah, 2nd edition, PHI.
2	E-Book : Diana Lorentz, “Oracle® Database SQL Reference”, ORACLE, Dec, 2005.
3	E-Book : Bill Pribyl, Steven Feuerstein, “Oracle PL/SQL Programming”, O'Reilly Media, Inc.,6th Edition, February 2014.

	Reference Books
1	Database Management Systems, Majumdar & Bhattacharya, 2007, TMH.
2	Database Management Systems, Gerald V. Post, 3rd edition, TMH.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	http://www.digimat.in/nptel/courses/video/106105175/L01.html
2	https://www.tutorialspoint.com/oracle_sql/index.htm
Course Designed By:	

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Visual Basic**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Core : 9**	**6**	**0**	**0**	**4**
Pre-requisite		Knowledge in programming language and oopsconcept.	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. The main aim of the course is to cover visual basic programming skills required for modernsoftware development.
2. To study the advantages of Controls available with visual basic.
3. To gain a basic understanding of database access and management using data controls.
4. To facilitate the learner to carry out project works using the tools available in VB and MSAccess.

Expected Course Outcomes:

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

1	Demonstrate fundamental skills in utilizing the tools of a visual environment such as command, menus and toolbars.	**K1**
2	Implement SDI and MDI applications using forms, dialogs and other types of GUI components.	**K2**
3	Understand the connectivity between VB with MS-ACCESS database.	**K3**
4	Implement the methods and techniques to develop projects.	**K4**
5	Attain a good practical skill of managing ODBC and Data Access Objects	**K2-K4**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**INTRODUCTION TO VB**	**15 hours**

Getting Started with VB6, Programming Environment, working with Forms, Developing an application, Variables, Data types and Modules, procedures and control structures, arrays. Workingwith Controls: Creating and using controls, working with control arrays.

Unit:2	**MENUS IN VB**	**15 hours**

Menus, Mouse events and Dialog boxes: Mouse events, Dialog boxes, MDI and Flex grid: MDI,Using the Flex grid control.

Unit:3	ODBC AND DATA ACCESS OBJECTS	15 hours
ODBC and Data Access Objects: Data Access Options, ODBC, Remote data objects, ActiveX EXE and ActiveX DLL: Introduction, Creating an ActiveX EXE Component, Creating ActiveXDLL Component.		
Unit:4	**OBJECT LINKING AND EMBEDDING**	**15 hours**
Object Linking and Embedding: OLE fundamentals, Using OLE Container Control, Using OLE Automation objects, OLE Drag and Drop, File and File System Control: File System Controls, Accessing Files.		
Unit:5	**CONTROLS IN VB**	**12 hours**
Additional controls in VB: sstab control, setting properties at runtime, adding controls to tab, list control, tabstrip control, MS Flexgrid control, Why ADO, Establishing a reference, Crystal and Data reports.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	Visual Basic 6.0 Programming, Content Development Group, TMH, 8th reprint, 2007. **(Unit Ito Unit IV)**
2	Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publishing House, FourthReprint, 2006. **(Unit V)**

Reference Books	
1	Gray Cornell (2003), ”Visual Basic 6 from ground up” TMH, New Delhi, 1st Edition,
2	Deitel and Deitel, T.R.Nieto (1998), “Visual Basic 6 - How to Program”, Pearson Education.First Edition.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
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Course Designed By:

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Programming Lab –VB & Oracle**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Core Lab : 6**	**0**	**0**	**6**	**4**
Pre-requisite		Students should have the theoretical knowledgein visual basic and oops concept.	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To develop applications using Graphical User Interface tools.
2. To understand the design concepts.
3. To design and build database systems and demonstrate their competence.
4. To create requirement analysis and specification for software applications.

Expected Course Outcomes:

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

1	Understand the concepts of Visual Basic.	**K1**
2	Learn the advantages of Controls in VB	**K2**
3	Design and develop the event- driven applications using Visual Basic framework.	**K3**
4	Apply the knowledge of database methods.	**K4**
5	Learn basics of PL/SQL and develop programs using Cursors, Exceptions,Procedures and Functions	**K6**

K1 – Remember; **K2** – Understand; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate; **K6** – Create

Programs	**36 hours**

1. Construction of an Arithmetic Calculator (Simple).
2. Writing simple programs using loops and decision-making statements.
   a. Generate Fibonacci series.
   b. Find the sum of N numbers.
3. Write a program to create a menu and MDI Forms.
4. Write a program to display files in a directory using DriveListBox, DirListBox and FileListBox control and open, edit and save text file using Rich text box control.
5. Write a program to illustrate Common Dialog Control and to open, edit and save text file.

6. Write a program to implement animation using timers.	
7. Write a simple VB program to accept a number as input and convert it into a. Binary b. Octal c. Hexa-decimal	
8. Create a table for Employee details with Employee Number as primary key and following fields: Name, Designation, Gender, Age, Date of Joining and Salary. Insert at least ten rows and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping operators.	
9. Write a PL/SQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.	
10. Write a PL/SQL program to implement the concept of Triggers	
11. Write a PL/SQL program to implement the concept “Procedures”.	
12. Write a VB program to manipulate the student mark list with oracle database connectivityprogram.	
	Total Lecture hours **36 hours**

Text Book(s)	
1	Visual Basic 6.0 Programming, Content Development Group, TMH, 8th reprint, 2007. **(Unit Ito Unit IV)**
2	Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publishing House, FourthReprint, 2006. **(Unit V)**
3	E-Book : Bill Pribyl, Steven Feuerstein, “Oracle PL/SQL Programming”, O’Reilly Media, Inc.,6th Edition, February 2014.
Reference Books	
1	Gray Cornell (2003), ”Visual Basic 6 from ground up” TMH, New Delhi, 1st Edition,
2	Deitel and Deitel, T.R.Nieto (1998), “Visual Basic 6 – How to Program”, Pearson Education.First Edition.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Course Designed By:	

ELECTIVE I

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**PYTHON Programming**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Elective : I**	**6**	**0**	**0**	**4**
Pre-requisite		Knowledge on logic of the programs and oopsconcept.	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To introduce the fundamentals of Python Programming.
2. To teach about the concept of Functions in Python.
3. To impart the knowledge of Lists, Tuples, Files and Directories.
4. To learn about dictionaries in python.
5. To explores the object-oriented programming, Graphical programming aspects of pythonwith help of built in modules..

Expected Course Outcomes:

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

1	Remembering the concept of operators, data types, looping statements in Python programming.	**K1**
2	Understanding the concepts of Input / Output operations in file..	**K2**
3	Applying the concept of functions and exception handling	**K3**
4	Analyzing the structures of list, tuples and maintaining dictionaries	**K4**
5	Demonstrate significant experience with python program development environment	**K4-K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**BASICS OF PYTHON**	**10 hours**

BASICS : Python - Variables - Executing Python from the Command Line - Editing Python Files - Python Reserved Words - Basic Syntax-Comments - Standard Data Types – Relational Operators - Logical Operators - Bit Wise Operators - Simple Input and Output.

Unit:2	**CONTROL STATEMENTS**	**10 hours**

CONTROL STATEMENTS: Control Flow and Syntax - Indenting - if Statement - statements and expressions- string operations- Boolean Expressions -while Loop - break and continue - for Loop. LISTS: List-list slices - list methods - list loop – mutability – aliasing - cloning lists - listparameters. TUPLES: Tuple assignment, tuple as return value - Sets – Dictionaries

Unit:3	**FUNCTIONS**	**10 hours**
FUNCTIONS: Definition - Passing parameters to a Function - Built-in functions- Variable Number of Arguments - Scope – Type conversion-Type coercion-Passing Functions to a Function - Mapping Functions in a Dictionary – Lambda - Modules - Standard Modules – sys – math – time - dir - help Function.		
Unit:4	**ERROR HANDLING**	**12 hours**
ERROR HANDLING: Run Time Errors - Exception Model - Exception Hierarchy - Handling Multiple Exceptions - Data Streams - Access Modes Writing - Data to a File Reading - Data From a File - Additional File Methods - Using Pipes as Data Streams - Handling IO Exceptions - Working with Directories.		
Unit:5	**OBJECT ORIENTED FEATURES**	**12 hours**
OBJECT ORIENTED FEATURES: Classes Principles of Object Orientation - Creating Classes - Instance Methods - File Organization - Special Methods - Class Variables – Inheritance – Polymorphism - Type Identification - Simple Character Matches - Special Characters - Character Classes – Quantifiers - Dot Character - Greedy Matches – Grouping - Matching at Beginning or End - Match Objects – Substituting - Splitting a String - Compiling Regular Expressions.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**55 hours**

Text Book(s)

1	Mark Summerfield, Programming in Python 3: A Complete introduction to the PythonLanguage, Addison-Wesley Professional, 2009.
2	Martin C. Brown, PYTHON: The Complete Reference, McGraw-Hill, 2001
3	E. Balagurusamy (2017), “Problem Solving and Python Programming”, McGraw-Hill, FirstEdition.

Reference Books

1	Allen B. Downey, “Think Python: How to Think Like a Computer Scientist”, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016
2	Guido van Rossum and Fred L. Drake Jr, An Introduction to Python – Revised and updated forPython 3.2, Network Theory Ltd., 2011
3	Wesley J Chun, Core Python Applications Programming‖, Prentice Hall, 2012.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	
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Course Designed By:

Course code		Computer Networks	L	T	P	C
Core/Elective/ Supportive		Elective : I	6	0	0	4
Pre-requisite		Students should have the knowledge on computer connectivity and connectivity peripherals.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To identify various components in a data communication system and understand state-of-the-art in network protocols, architectures and applications.
2. To enable students through the concepts of computer networks, different models and theirinvolvement in each stage of network communication.
3. To educate the concepts of terminology and concepts of the OSI reference model and theTCP/IP reference model and protocols such as TCP, UDP and IP.
4. To be familiar with the concepts of protocols, network interfaces, and design/performanceissues in local area networks and wide area networks.
5. Introduce the student to a network routing for IP networks and how a collision occurs andhow to solve it and how a frame is created and character count of each frame.

Expected Course Outcomes:

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

1	Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types ofnetworks.	**K1**
2	Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security.	**K2**
3	Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.	**K3**
4	Analyze the requirements for a given organizational structure and select the mostappropriate networking architecture and technologies	**K4**
5	Knowledge about different computer networks, reference models and the functionsof each layer in the models	**K2-K4**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	BASICS OF NETWORKS AND OSI MODEL	15 hours

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 – Comparison of OSI and TCP/IP -Critique of OSI and protocols – Critique of the TCP/IP Reference model.

Unit:2	PHYSICAL LAYER	15 hours

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.		
Unit:3	**DATA-LINK LAYER**	**15 hours**
DATA-LINK LAYER: Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols. MEDIUM-ACCESS CONTROL SUB LAYER: Multiple Access Protocols – Ethernet – Wireless LANs - Broadband Wireless – Bluetooth.		
Unit:4	**NETWORK LAYER**	**15 hours**
NETWORK LAYER: Routing algorithms – Congestion Control Algorithms. TRANSPORT LAYER: Elements of Transport Protocols – Internet Transport Protocols: TCP.		
Unit:5	**APPLICATION LAYER**	**12 hours**
APPLICATION LAYER: DNS – E-mail. NETWORK SECURITY: Cryptography – SymmetricKey Algorithms – Public Key Algorithms – Digital Signatures.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	Computer Networks, Andrew S. Tanenbaum, 4th edition, PHI. *(UNIT-I:1.2-1.4 UNIT-II:2.2-2.4UNIT-III:4.2-4.6 UNIT-IV:5.2,5.3,6.2,6.5 UNIT-V:7.1,7.2,8.1-8.4)*
Reference Books	
1	Data Communication and Networks, Achyut Godbole, 2007, TMH.
2	Computer Networks: Protocols, Standards, and Interfaces, Uyless Black, 2nd ed, PHI
3	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Course Designed By:	

Course code		Organizational Behaviour	L	T	P	C
Core /Elective/ Supportive		Elective : I	6	0	0	4
Pre-requisite		Basic knowledge in human behavior skills	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To help the students to develop cognizance of the importance of human behaviour.
2. To enable students to describe how people behave under different conditions and understandwhy people behave as they do.
3. To provide the students to analyses specific strategic human resources demands for futureaction.
4. To enable students to synthesize related information and evaluate options for the most logical and optimal solution such that they would be able to predict and control human behaviour andimprove results.

Expected Course Outcomes:

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

1	Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.	**K1**
2	Develop Managerial skills for Individual Behaviors.	**K2**
3	Analyze the complexities associated with management of the group behavior in the organization. Analyze how to manage the Stress during a job.	**K3**
4	Develop an Organizational Behaviour model for any type of Organization.	**K3**
5	Analyze the Common biases and eradication in Decision Making Process.	**K4**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION	15 hours

Introduction to Organizational Behavior –Related Disciplines – Theoretical Framework – Organizational Approaches – Modern Organizational Scenario: Impact of Globalization

Unit:2	INDIVIDUAL BEHAVIOR	15 hours

Individual Behavior – Perception – Process – Changes - Personality and Attitudes – Job Satisfaction

Unit:3	MOTIVATION	15 hours

Motivation: Needs, Content and Process: Motivation: Content Theories -ghh– Process Theories – Contemporary Theories – Motivation Applied – Job Design and Goal setting. Leadership –Background – Process- Styles – Activities – Skills

Unit:4	GROUP	15 hours

Group Dynamics – The nature of Informal Organizations – Formal Groups – Interactive conflict: Interpersonal conflict – Inter-group behavior and conflict – Negotiation Skills: Going beyond conflict management – Traditional Negotiation Approaches - Contemporary

negotiation skills.		
Unit:5	**COMMUNICATION**	**12 hours**
Communication – Role and background – Interpersonal communication – Informal communication- The Decision Making process – Participative Decision making techniques –Organization design – culture – Organization change and development		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	Fred Luthans, Organizational Behavior, 9th Edition, McGraw Hill Irwin, 2002.
2	John W. Newstorm and Keith Davis, Organizational Behavior, 10th Edition.

Reference Books	
1	Robbins, S. P., & Judge, T. (2013). Organizational behavior (15th ed.). Boston: Pearson.
2	Newstrom J. W., & Davis, K. (2011). Human behavior at work (12th ed.). Tata McGraw Hill

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Course Designed By:

SKILL BASED SUBJECT-III

BHARATHIAR UNIVERSITY

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B.Sc. CS/IT/CT/SS/MM/CSA &BCA

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SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Software Testing**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Skill based Subject : 3**	**6**	**0**	**0**	**3**
Pre-requisite		Basic knowledge in software project and SDLC	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To study fundamental concepts in software testing
2. To discuss various software testing issues and solutions in software unit test, integrationand system testing.
3. To expose the advanced software testing topics, such as object-oriented software testingmethods.
4. List a range of different software testing techniques and strategies and be able to applyspecific automated unit testing method to the projects.

Expected Course Outcomes:

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

1	Explain the basic concepts and the processes that lead to software testing	**K2**
2	Design test cases from the given requirements using Black box testing techniques	**K3**
3	Identify the test cases from Source code by means of white box testing techniques	**K3**
4	Know about user acceptance testing and generate test cases for it	**K4**
5	Examine the test adequacy criteria to complete the testing process	**K4**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**SOFTWARE DEVELOPMENT LIFE CYCLE MODELS**	**15 hours**

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.

Unit:2	**BLACK-BOX TESTING**	**15 hours**

Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black- Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash.

Unit:3	SYSTEM AND ACCEPTANCE TESTING	15 hours
System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.		
Unit:4	**PERFORMANCE TESTING**	**15 hours**
Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.		
Unit:5	**TEST PLANNING, MANAGEMENT, EXECUTION AND REPORTING**	**12 hours**
Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)

1	Software Testing Principles and Practices, Srinivasan Desikan & Gopalswamy Ramesh, 2006, Pearson Education. *(UNIT-I: 2.1-2.5, 3.1-3.4 UNIT-II: 4.1-4.4, 5.1-5.5 UNIT III: 6 .1-6.7 (UNIT IV: 7.1-7.6, 8.1-8.5 UNIT-V: 15.1-15.6, 17.4-17.7)*
2	Limaye M.G., "Software Testing Principles, Techniques and Tools", Second Reprint, TMHPublishers, 2010.
3	Aditya P.Mathur, "Foundations of Software Testing", 2nd Edition, Pearson Education, 2013.

Reference Books

1	Effective Methods of Software Testing, William E. Perry, 3rd ed, Wiley India.
2	Software Testing, Renu Rajani, Pradeep Oak, 2007, TMH.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

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Course Designed By:

Sixth Semester

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

SEMESTER – VI

Course Code	Title of the Course	Credits	Hours		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
SIXTH SEMESTER							
	Core 10: Graphics & Multimedia	4	5		25	75	100
	Core 11: Project Work Lab %%	8	5		-	200	200
	Core Lab 7: Programming Lab – Graphics & Multimedia	4		6	40	60	100
	Elective-II : Network Security and Cryptography / Artificial Intelligence and Expert Systems / Web Technology	4	5		25	75	100
	Elective-III : Data Mining / Open Source Software / Internetof Things (IoT)	4	5		25	75	100
	Skill based Subject 4 (lab) : Software Testing Lab	3		4	30	45	75
	Extension Activities	2			50	-	50
	Total	**29**	**20**	**10**	**195**	**530**	**725**

PART – III – CORE

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Graphics & Multimedia**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Core: 10**	**5**	**0**	**0**	**4**
Pre-requisite		Basic knowledge in 2D, 3D and multimedia fileformats	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. Design and apply two dimensional graphics and transformations.
2. Design and apply three dimensional graphics and transformations.
3. Apply Illumination, color models and clipping techniques to graphics.
4. Understood Different types of Multimedia File Format.

Expected Course Outcomes:

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

1	Explain applications, principles, commonly used and techniques of computer graphics and algorithms for Line-Drawing, Circle- Generating and Ellipse- Generating.	**K2**
2	Students will get the concepts of 2D and 3D, Viewing, Curves and surfaces,Hidden Line/surface elimination techniques	**K3**
3	Studies concepts of Multimedia Systems, Text, Audio and Video tools	**K3**
4	Compressing audio and video using MPEG-1 and MPEG-2	**K4**
5	Creates Animation with special effects using algorithms	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**OUTPUT PRIMITIVES**	**15 hours**

Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms. Attributes of OutputPrimitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

Unit:2	**2D GEOMETRIC TRANSFORMATIONS**	**15 hours**

2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. 2D Viewing: The Viewing Pipeline – Viewing Co- ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations.

Unit:3	**TEXT**	**15 hours**

Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats. Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera – Interface Standards – Specification of Digital Images – CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.		
Unit:4	**AUDIO**	**15 hours**
Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Basics of Staff Notation – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Recording Systems – Audio and Multimedia – Voice Recognition and Response - Audio Processing Software.		
Unit:5	**VIDEO AND ANIMATION**	**12 hours**
Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – PC Video – Video File Formats and CODECs – Video Editing – Video Editing Software. Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web – Special Effects – Rendering Algorithms. Compression: MPEG-1 Audio – MPEG-1 Video - MPEG-2Audio – MPEG-2 Video.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	Computer Graphics, Donald Hearn, M.Pauline Baker, 2nd edition, PHI. (UNIT-I: 3.1-3.6,4.1-4.5 & UNIT-II: 5.1-5.4,6.1-6.5)
2	Principles of Multimedia, Ranjan Parekh, 2007, TMH. (UNIT III: 4.1-4.7,5.1-5.16 UNIT-IV: 7.1-7.3,7.8-7.14,7.18-7.20,7.22,7.24,7.26-28 UNIT-V: 9.5-9.10,9.13,9.15,10.10-10.13)
Reference Books	
1	Computer Graphics, Amarendra N Sinha, Arun D Udai, TMH.
2	Multimedia: Making it Work, Tay Vaughan, 7th edition, TMH.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	

Course Designed By:

Course code		Project Work Lab	L	T	P	C
Core/Elective/Supportive		Core: 11	0	0	5	8
Pre-requisite		Students should have the strong knowledge in anyone of the programming languages in this course.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To understand and select the task based on their core skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.
4. Express technical and behavioral ideas and thought in oral settings.
5. Prepare and conduct oral presentations

Expected Course Outcomes:

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

1	Formulate a real world problem and develop its requirements develop a designsolution for a set of requirements.	**K3**
2	Test and validate the conformance of the developed prototype against the originalrequirements of the problem.	**K5**
3	Work as a responsible member and possibly a leader of a team in developingsoftware solutions.	**K3**
4	Express technical ideas, strategies and methodologies in written form. Self-learn new tools, algorithms and techniques that contribute to the software solution of the project.	**K1-K4**
5	Generate alternative solutions, compare them and select the optimum one.	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

AIM OF THE PROJECT WORK

1. The aim of the project work is to acquire practical knowledge on the implementation of the programming concepts studied.
2. Each student should carry out individually one project work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.
3. The project work should be compulsorily done in the college only under the supervision of thedepartment staff concerned.

Viva Voce

1. Viva-Voce will be conducted at the end of the year by both Internal (Respective Guides) andExternal Examiners, after duly verifying the **Annexure Report** available in the College, fora total of 200 marks at the last day of the practical session.
2. Out of 200 marks, 160 marks for project report and 40 marks for Viva Voce.

Project Report Format

PROJECT WORK

TITLE OF THE DISSERTATION

Bonafide Work Done

bySTUDENT NAME

REG. NO.

Dissertation submitted in partial fulfillment of the requirements for the award of

<Name of the Degree>

of Bharathiar University, Coimbatore-46**.**

College Logo

Signature of the Guide

Signature of the HOD

Submitted for the Viva-Voce Examination held on _____

Internal Examiner

External Examiner

Month – Year

CONTENTS

Acknowledgement Contents

Synopsis

1. Introduction

Organization Profile

System Specification

Hardware Configuration

Software Specification

2. System Study

Existing System Drawbacks

Proposed System
Features

3. System Design and Development

File Design
Input Design
Output Design
Database Design
System Development
Description of Modules (Detailed explanation about the project work)

4. Testing and Implementation

5. Conclusion
Bibliography
Appendices

A. Data Flow Diagram
B. Table Structure
C. Sample Coding
D. Sample Input
E. Sample Output

Course Designed By:

Course code		Programming Lab – Graphics & Multimedia	L	T	P	C
Core/Elective/Supportive		Core Lab : 7	0	0	6	4
Pre-requisite		Students should have the basic knowledge on C and C++ to do computer graphics and multimedia applications.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To learn the basic principles of 2-dimensional computer graphics.
2. Provide an understanding of how to scan convert the basic geometrical primitives, how totransform the shapes to fit them as per the picture definition.
3. Provide an understanding of mapping from a world coordinates to device coordinates, clipping and projections.
4. To be able to discuss the application of computer graphics concepts in the development ofcomputer games, information visualization and business applications.
5. To comprehend and analyse the fundamentals of animation, virtual reality, underlying technologies, principles and applications.

Expected Course Outcomes:

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

1	Understand the basic concepts of computer graphics.	**K1**
2	Design scan conversion problems using C and C++ programming.	**K2**
3	Apply clipping and filling techniques for modifying an object.	**K3**
4	Understand the concepts of different type of geometric transformation ofobjects in 2D.	**K4**
5	Understand and develop the practical implementation of modeling, rendering,viewing of objects in 2D	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**
Graphics	
1. Write a program to rotate an image.	
2. Write a program to drop each word of a sentence one by one from the top.	
3. Write a program to drop a line using DDA Algorithm.	
4. Write a program to move a car with sound effect.	
5. Write a program to bounce a ball and move it with sound effect.	
6. Write a program to test whether a given pixel is inside or outside or on a polygon.	
Multimedia	
7. Create Sun Flower using Photoshop.	
8. Animate Plane flying in the Clouds using Photoshop.	
9. Create Plastic Surgery for the Nose using Photoshop.	
10. Create See-through text using Photoshop.	
11. Create a Web Page using Photoshop.	
12. Convert Black and White Photo to Color Photo using Photoshop.	
Total Lecture hours	**36 hours**

Text Book(s)	
1	Computer Graphics, Donald Hearn, M.Pauline Baker, 2nd edition, PHI.
2	Principles of Multimedia, Ranjan Parekh, 2007, TMH.

Reference Books	
1	Computer Graphics, Amarendra N Sinha, Arun D Udai, TMH.
2	Multimedia: Making it Work, Tay Vaughan, 7th edition, TMH.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
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Course Designed By:	

ELECTIVE – II

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		Network Security and Cryptography	L	T	P	C
Core/Elective/ Supportive		Elective: II	5	0	0	4
Pre-requisite		Basic knowledge on security threats innetworking	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To learn the need for network security and security approaches.
2. To inculcate the concept of transferring authentic data along the network with severalmethods and algorithms.
3. To enrich the knowledge on different types of Internet Security Protocols.

Expected Course Outcomes:

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

1	Remember the basic concept of Cryptography and various types of attacks.	**K1**
2	Understand about various types of protocols for Internet Security.	**K2**
3	Implement various algorithms for Cryptography	**K3**
4	Review Firewall and IP security	**K4**
5	To be familiar with network security threats and countermeasure	**K3-K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**SERVICE MECHANISM**	**15 hours**

Service mechanism and attacks – The OSI security architecture – A model for network security – symmetric Cipher model – Substitution techniques – transposition techniques – simplified des – blockchipper principles – the strength of des – block chipper design principles and modes of operation.

Unit:2	**TYPES OF DES**	**12 hours**

Triple des-blow fish – RCS Advanced Symmetric Block Ciphers –RC4 stream Cipher confidentially using symmetric encryption – introduction to number theory – public – key cryptography and RSA.

Unit:3	**KEY MANAGEMENT**	**15 hours**

Key management – Diffle Hellman key exchange – message authentication and hash function – hash algorithm – digital signature and authentication protocols – digital signature standard.

Unit:4	**AUTHENTICATION**	**15 hours**

Authentication application – pretty good privacy – S/MIME – ip security – web security considerations –secure socket layer transport layer security –secure electronic transaction.

Unit:5	**INTRUDERS**	**15 hours**
Intruders –intrusion detection – password management –viruses and related threats – viruscountermeasures – fire wall design principles – trusted systems		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	William Stallings, Cryptography and Network Security Principles and Practices, Fourth edition,PHI Education Asia
Reference Books	
1	Atul Kahate, Cryptography and Network Security, 2nd Edition, TMH.
2	Behrouz A.Forouzan, Cryptography and Network Security, TMH.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
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Course Designed By:

Course code		Artificial Intelligence and Expert Systems	L	T	P	C
Core/Elective/ Supportive		Elective: II	5	0	0	4
Pre-requisite		Basic knowledge on knowledge representation,reasoning and problem solving skills	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To understand the basic concepts of Artificial Intelligence and identify the AI problems anddomains.
2. To provide search techniques to solve the problems.
3. To represent and access the domain specific knowledge.
4. Ability to apply knowledge representation, reasoning, and machine learning techniques toreal-world problems

Expected Course Outcomes:

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

1	Understand the nature of AI problems and task domains of AI.	**K1**
2	Apply the appropriate search procedures to solve the problems by usingbest algorithms.	**K2**
3	Analyze and select the suitable knowledge representation method.	**K3**
4	Manipulate the acquired knowledge and infer new knowledge.	**K4**
5	Demonstrate the development of AI systems by encoding the knowledge.	**K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION	15 hours

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

Unit:2	HEURISTIC SEARCH TECHNIQUES	12 hours

Heuristic Search techniques: Generate and Test – Hill Climbing – Best-Fist, Problem Reduction,Constraint Satisfaction, Means-end analysis.

Unit:3	KNOWLEDGE REPRESENTATION	15 hours

Knowledge representation issues: Representations and mappings – Approaches to Knowledgerepresentations – Issues in Knowledge representations – Frame Problem.

Unit:4	PREDICATE LOGIC	15 hours

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.

Unit:5	REPRESENTING KNOWLEDGE USING RULES	15 hours

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems-Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

Unit:6	Contemporary Issues	3 hours

Expert lectures, online seminars – webinars

	Total Lecture hours	**75 hours**
Text Book(s)		
1	Artificial Intelligence, Elaine Rich and Kelvin Knight, TMH, 2nd Edn, 1991	
2	Artificial Intelligence A Modern Approach, Stuart Russell & Peter Norvig, 2nd EditionPerason.	
Reference Books		
1	Artificial Intelligence, George F Luger, 4th Edition, Pearson, 2002.	
2	Foundations of Artificial Intelligent and Expert Systems, V S Janaki Raman, K Sarukesi, PGopalakrishnan, MacMillan India limited.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
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Course Designed By:		

Course code		Web Technology	L	T	P	C
Core/Elective/ Supportive		Elective: II	5	0	0	4
Pre-requisite		Basic knowledge in web server, browser and web application	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. On completion of this course, a student will be familiar with client server architecture andable to develop a web application using java technologies.
2. Students will gain the skills and project-based experience needed for entry into webapplication and development careers
3. Understand best technologies for solving web client/server problems
4. Use Java script for dynamic effects and to validate form input entry
5. Analyze to Use appropriate client-side or Server-side applications

Expected Course Outcomes:

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

1	Understand and analyse the TCP/IP basics.	**K1**
2	Understand Domain server name, FTP, TFTP, basics of WWW, web browser architecture.	**K2**
3	Knowledge of Microsoft and java technologies, dynamic web pages, DHTML, ASP and JSP.	**K2-K3**
4	Understanding active web pages, Java Applet, Java bean, CORBA, RMI and EDI architecture	**K2-K3**
5	Knowledge on XML, XML parser, WAP	**K4-K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit:1	TCP/IP	15 hours

TCP/IP: TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? – TCP Packet format - Persistent TCP connections – UDP – Differences between TCP and UDP.

Unit:2	DNS	12 hours

DNS – E-mail – FTP – TFTP – History of WWW – Basics of WWW and Browsing – Local information on the internet – HTML – Web Browser Architecture – Web Pages and Multimedia –Remote Login (TELNET).

Unit:3	INTRODUCTION TO WEB TECHNOLOGY	15 hours

Introduction to Web Technology: Web pages – Tiers – Concept of a Tier – Comparison of Microsoft and Java Technologies – Web Pages – Static Web Pages – Plug-ins – Frames – Forms. Dynamic Web Pages: Need – Magic of Dynamic Web Pages – Overview of Dynamic Web Page Technologies – Overview of DHTML – Common Gateway Interface – ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages.

Unit:4	ACTIVE WEB PAGES	15 hours

Active Web Pages: Active Web Pages in better solution – Java Applets – Why are Active Web Pages Powerful? – Lifecycle of Java Applets – ActiveX Controls – Java Beans. Middleware and Component-Based E-Commerce Architectures: CORBA – Java Remote Method Invocation – DCOM. EDI: Overview – Origins of EDI – Understanding of EDI – Data Exchange Standards – EDI Architecture – Significance of EDI – Financial EDI – EDI and internet.		
Unit:5	**XML**	**15 hours**
XML: SGML – Basics of XML – XML Parsers – Need for a standard. WAP: Limitations of Mobile devices – Emergence of WAP – WAP Architecture – WAP Stack – Concerns about WAP and its future – Alternatives to WAP.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	Web Technologies: TCP/IP to Internet Applications Architectures – Achyut S Godbole & AtulKahate, 2007, TMH. *(UNIT-I: 3.1-3.5,4.1-4.12 UNIT-II: 5.1-5.4,6.1-6.7 UNIT III:8.1-8.1,9.1-9.13 UNIT IV: 10.1-10.7,15.1-15.3,16.1-16.8 UNIT-V: 17.1-17.4,18.1-18.6)*
Reference Books	
1	Internet and Web Technologies, Rajkamal, TMH.
2	TCP/IP Protocol Suite, Behrouz A. Forouzan, 3rd edition, TMH.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Course Designed By:

ELECTIVE – III

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Data Mining**	**L**	**T**	**P**	**C**
Core/Elective/ Supportive		**Elective: III**	**5**	**0**	**0**	**4**
Pre-requisite		**Basic knowledge on data, database, andstatistical functions**	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To introduce the concept of data Mining as an important tool for enterprise data managementand cutting edge technology for building competitive advantage.
2. To enable students to effectively identify sources of data and process it for data mining
3. To make students well versed in all data mining algorithms, methods of evaluation.
4. To impart knowledge of tools used for data mining
5. To provide knowledge on how to gather and analyze large sets of data to gain useful businessunderstanding.

Expected Course Outcomes:

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

1	Identify data mining tools and techniques in building intelligent machines understand	**K1-K2**
2	Analyze various data mining algorithms in applying in real time applications.	**K2-K4**
3	Demonstrate the data mining algorithms to combinatorial optimization problems	**K2-K3**
4	Illustrate the mining techniques like association, classification and clustering on transactional databases.	**K2-K3**
5	Perform exploratory analysis of the data to be used for mining.	**K3-K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**BASIC DATA MINING TASKS**	**15 hours**

Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

Unit:2	**DATA MINING TECHNIQUES**	**12 hours**

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – DecisionTrees – Neural Networks – Genetic Algorithms.

Unit:3	**CLASSIFICATION**	**15 hours**

Classification: Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques.		
Unit:4	**CLUSTERING**	**15 hours**
Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms.Partitional Algorithms.		
Unit:5	**ASSOCIATION RULES**	**15 hours**
Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel & Distributed		
Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rules Techniques – Measuring the Quality of Rules.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**75 hours**

Text Book(s)

1	Margaret H.Dunbam, Data Mining Introductory and Advanced Topics, Pearson Education – 2003.
2	Arun K.Pujari, “Data Mining Techniques”, Universities Press, 2010.

Reference Books

1	Jiawei Han & Micheline Kamber, Data Mining Concepts & Techniques, 2001 Academic Press.
2	K.P.Soman, Shyam Diwakar, V.Ajay, “Insight into Data Mining – Theory and Practice”, Prentice Hall of India, 2009.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

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Course Designed By:

Course code		Open Source Software	L	T	P	C
Core/Elective/ Supportive		Elective: III	5	0	0	4
Pre-requisite		Basic understanding in scripting language andSQL	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To expose students to free open source software environment and introduce them to useopen source packages.
2. Demonstrate different open source technology like Linux, PHP & MySQL with differentpackages.
3. To understand open source software practices and tools.
4. To use the open source software in operating systems, Programming and web framework inapproaching real time applications.

Expected Course Outcomes:

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

1	Understand the significance of open source practices and guidelines.	**K2**
2	Manipulate open source databases based on user requirements	**K3**
3	Implement web programming with PHP	**K3**
4	Integrate open source web frameworks in an application	**K4**
5	Write desktop and web applications with Python	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION TO OPEN SOURCE	15 hours

Introduction to open sources – Need of open sources – advantages of open sources – application of open sources. Open source operating systems: LINUX: Introduction – general overview –Kernel mode and user mode –process – advanced concepts – scheduling – personalities – cloning – signals – development with Linux.

Unit:2	MYSQL	12 hours

MySQL: Introduction – setting up account – starting, terminating and writing your own SQL programs-record selection Technology – working with strings – Date and Time – sorting Query results – generating summary –working with meta data –using sequences – MySQL and Web.

Unit:3	PHP	15 hours

PHP: Introduction –programming in web environment –variables- constants – data types – operators – statements – functions – arrays – OOP – string manipulations and regular expression – file handling and data storage – PHP and SQL database – PHP and LDAP – PHP connectivity – sending and receiving E-mails – debugging and error handling – security –templates.

Unit:4	PYTHON	15 hours

Syntax and style – Python objects – numbers – sequences – strings – lists and tuples – dictionaries – conditional loops –files – input and output – errors and exceptions – functions – modules –classes and OOP – execution environment.

Unit:5	**PERL**	**15 hours**
Pert backgrounder – pert overview – pearl parsing rules – variables and data – statements and control structures – subroutines -packages and modules – working with files – data manipulation.		
Unit:6	**Contemporary Issues**	**3 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**75 hours**

Text Book(s)	
1	The Linux Kernel Book, Remy Card, Eric and Frank Mevel, Wiley Publications 2003.
2	MySQL Bible, Steve Suchring, John Wiley 2002.
Reference Books	
1	Programming PHP, Rasmus Lerdorf and Levin Tatroe, O_Reilly, 2002
2	Core Python Programming, Wesley J. Chun, Prentice Hall, 200
3	Perl: The Complete Reference, 2nd Edn, Martin C. Brown, TMH , 2009
4	MySQL: The Complete Reference, 2nd Edn, Vikram Vaswani, TMH, 2009
5	PHP: The Complete Reference, 2nd Edn, Steve Holzner, TMH 2009.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Course Designed By:

Course code		Internet of Things (IoT)	L	T	P	C
Core/Elective/ Supportive		Elective: III	5	0	0	4
Pre-requisite		Students should have the basic understanding oflogical circuits and hardware architecture.	Syllabus Version		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To learn the concepts of IoT and its protocols.
2. To learn how to analysis the data in IoT.
3. To develop IoT infrastructure for popular applications.
4. To report about the IoT privacy, security and vulnerabilities solution

Expected Course Outcomes:

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

1	To understand the fundamentals of Internet of Things.	**K1**
2	To know the basics of communication protocols and the designing principles of Web connectivity.	**K2**
3	To gain the knowledge of Internet connectivity principles	**K2-K3**
4	Designing and develop smart city in IoT	**K2-K3**
5	Analyzing and evaluate the data received through sensors in IOT.	**K4-K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	INTRODUCTION	15 hours

Introduction - Definition & characteristics of IoT - physical design of IoT - logical design of IoT - IoT enabling Technologies - IoT levels & Deployment templates. Domain specific Iots : Home Automation - cities - Environment - Energy - retail - logistics - Agriculture - Industry i Health andlife style.

Unit:2	IOT and M2M	12 hours

IoT and M2M - Deference between Iot and M2M - SDN and NFV for Iot - IoT systems management - SNMP - YANG - NETOPEER

Unit:3	IOT SPECIFICATION	15 hours

IoT platforms design Methodology - purpose and specification - process specification - Domain model specification - Information model specification - Service specification - IoT level specification - functional view specification - operational view specification - Device and component Integrators - Application Development.

Unit:4	LOGICAL DESIGN USING PYTHON	15 hours

Logical design using python - Installing python - type conversions - control flow - functions - modules - File handling - classes. IoT physical devices and End points, building blocks of IoT device - Raspberry Pi - Linux on Raspberry Pi - Raspberry Pi interfaces.

Unit:5	IOT AND CLOUD COMPUTING	15 hours

IoT physical servers & cloud computing - WAMP - Xively cloud for IoT - python Web applicationframe work - Amazon web services for IoT.

Unit:6	Contemporary Issues	3 hours

Expert lectures, online seminars – webinars

	Total Lecture hours	**75 hours**
Text Book(s)		
1	Internet of Things - A hands on Approach Authors: Arshdeep Bahga, Vijay MadisettiPublisher: Universities press.	
Reference Books		
1	Internet of Things - Srinivasa K.G., Siddesh G.M. Hanumantha Raju R. Publisher: CengageLearning India pvt. Ltd (2018)	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1		
2		
3		
Course Designed By:		

ELECTIVE – III

BHARATHIAR UNIVERSITY

COIMBATORE-641 046

B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2020-2021 onwards)

SCHEME OF EXAMINATION - CBCS PATTERN

Course code		**Programming Lab – Software Testing**	**L**	**T**	**P**	**C**
Core/Elective/Supportive		**Skill based Subject Lab : 4**	**0**	**0**	**4**	**3**
Pre-requisite		**Basic knowledge on software projectdevelopment in SDLC**	**Syllabus Version**		2020-21 Onwards	

Course Objectives:

The main objectives of this course are to:

1. To gain knowledge about recording the test case in different modes.
2. To design and construct the test cases using Test Script Language.
3. To learn about GUI objects and bitmap objects

Expected Course Outcomes:

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

1	Understand the importance of software quality/software testing and apply software testing techniques for information systems development.	**K1**
2	Generate test cases from software requirements using various test processes forcontinuous quality improvement.	**K2**
3	Understand flow graphs and apply path testing.	**K3**
4	Apply software testing techniques in commercial environments and assess the adequacy of test suites using control flow, data flow and program mutation.	**K4**
5	Identify the inputs and deliverables of the testing process and work together as ateam in preparing a report	**K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Programs	**36 hours**

Write at least 10 TEST CASES for the following programs. Test cases can be for Input data, Conditional expressions, control transfer, output, etc. Run-Test-Debug- until all the test casesare in success status. Marks distribution as follows:

1. List of Test Descriptions (at least 10) for the Program. (20%)
2. Test Cases (40%)
3. Program with all test case results success (30%)
4. Record (10%)

TEST CASE EXAMPLE:

Test -Id	Test Description	Test Steps	Expected Output	Actual Output	Status
TC-01	Acceptance of 10 digit input data	Input 10 Digit Number	Accepting 10 digit number	Accepted 10 digit number	Success
TC-02	Non- acceptance of character data	Input a character data X	Character X should not be accepted	Accepting Character data	Failure

Modify PIC X(10) into PIC 9(10) and then run program for Test-id TC-02 again

Test -Id	Test Description	Test Steps	Expected Output	Actual Output	Status
TC-02	Non- acceptance of character data	Input a character data X	Character X should not be accepted	Character data not accepted	Success
TC-03	Digit sum of 10 digit is in single	Output data	Single digit sum digit	Single digit Sum	Success

1. Test the C program: Finding the sum of individual digits of a 10-digit number until a single digit is produced.	
2. Test the C Program: Accept the inputs student name, marks in five subjects and declare the result as PASS if the student gets minimum 40 in each subject; otherwise declare the result asFAIL.	
3. Test the C program: Program for generating n prime numbers	
4. Test the C program: Sort and store the elements of two arrays of integers into the third list.	
5. Test the C program: Experiment the operations of a stack using array implementation.	
6. Test the C program: Menu-driven option for queue operations like add, remove and display.	
7. Test the C++ program: Palindrome string checking program (using pointers)	
	Total Lecture hours **36 hours**

Text Book(s)	
1	
Reference Books	
1	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
2	
3	

Course Designed By:

Annexure

B. Sc. Computer Science

Syllabus

(With effect from 2020 -2021)

Program Code : 22K

DEPARTMENT OF COMPUTER SCIENCE

Bharathiar University

(A State University, Accredited with "A" Grade by NAAC and13th Rank among Indian Universities by MHRD-NIRF)
Coimbatore 641 046, INDIA

BHARATHIAR UNIVERSITY : : COIMBATORE 641046

DEPARTMENT OF COMPUTER SCIENCE

MISSION

- ✓ To develop IT professionals with ethical and human values.
- ✓ To organize, connect, create and communicate mathematical ideas effectively,through industry 4.0.
- ✓ To provide a learning environment to enhance innovations, problem solving abilities,leadership potentials, team-spirit and moral tasks.
- ✓ To nurture the research values in the developing areas of Computer Science andinterdisciplinary fields.
- ✓ Promote inter-disciplinary research among the faculty and the students to create stateof art research facilities.
- ✓ To promote quality and ethics among the students. Motivate the students to acquire entreprener