

B. Sc. Information Technology

Syllabus

AFFILIATED COLLEGES

Program Code: 26J

2020 – 2021 onwards

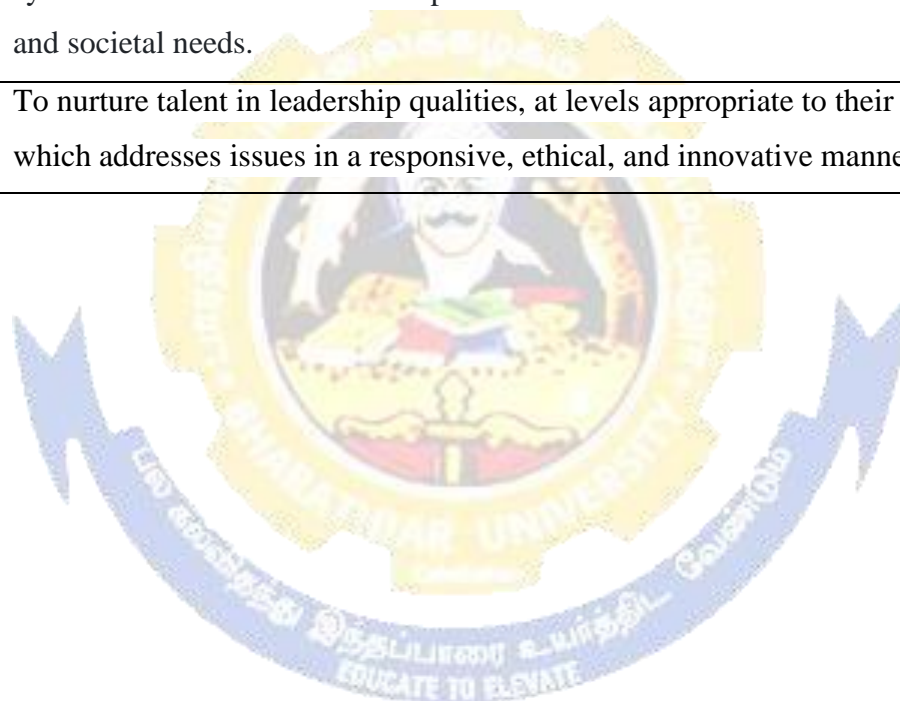


BHARATHIAR UNIVERSITY

(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. Information Technology program describe accomplishments that graduates are expected to attain within five to seven years after graduation	
PEO1	To obtain in-depth knowledge of software and hardware techniques, which provide a compact foundation to pursue continuing education and nurture the talent for innovation and research.
PEO2	To Engage in the Information Technology related Profession locally and globally by contributing ethically to the competent and professional practices.
PEO3	To enable Graduates will be skilled in the use of modern tools for critical problem solving and analyzing industrial and societal requirements
PEO4	To train the graduates in diversified and applied areas with analysis, design and synthesis of data to create novel products and solutions to meet current industrial and societal needs.
PEO5	To nurture talent in leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner.



Program Specific Outcomes (PSOs)	
After the successful completion of <u>B.Sc. Information Technology</u> program, the students are expected to	
PSO1	Develop an ability to communicate effectively with a range of audiences. Develop written and oral presentations of information technology solutions appropriate for a wide range of audiences.
PSO2	Develop and analyze quality computer applications by applying knowledge of software engineering, algorithms, programming, databases and networking.
PSO3	The graduates of the Program will be prepared to achieve their career goals in the software industry or pursue higher studies and enhance their professional knowledge.
PSO4	To identify and utilize the state-of-the-art tools and techniques in the design and development of software products and solutions.
PSO5	Practical experience in shipping real world software, using recent industry standard tools and collaboration techniques will equip to secure and succeed in IT industry



Program Outcomes (POs)	
On successful completion of the B.Sc. Information Technology 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, societal and environmental considerations.
PO4	Environment and sustainability: Understand the impact of software solutions in environmental and societal context and strive for sustainable development.
PO5	Modern tool usage: Use contemporary techniques, skills and tools necessary for integrated 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 on multidisciplinary teams to accomplish a common objective.
PO8	Communication Skills: An ability to communicate effectively with diverse types 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 for self-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. Information Technology 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
	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
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
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: Microprocessor & ALP	4	6		25	75	100
	Skill based Subject 1 : Introduction to web design & Applications	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 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) : HTML, XML and JavaScript 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 Soft Computing/ Animation Techniques / Business Intelligence	4	6		25	75	100
	Skill based Subject 3: Dot Net Programming	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 Administration/ Mobile Computing / Python programming	4	5		25	75	100
	Elective-III : Internet of Things (IoT)/ Component Technology/ E-Commerce	4	5		25	75	100
	Skill based Subject 4 (lab) : Dot Net 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

Course code	11T	TITLE OF THE COURSE	L	T	P	C
Core/Elective/Supportive		PART - I TAMIL – PAPER -1	3			3
Pre-requisite			Syllabus Version		2020-21	
Course Objectives:						
The main objectives of this course are to:						
ஆளுமை மேம்பாடு மற்றும் மொழித்திறனை வளர்த்தல் தன்னம்பிக்கையைத் தாண்டுதல்						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	புதுக்கவிதையின் மூலம் வாழ்வியல் விழுமியங்களை உணர்ந்து கொள்ளுதல்.					K1, K2
2	சிறந்த மற்றும் வாழும் கவிஞர்களை அறிந்து கொள்ளுதல்.					K2, K3
3	சிறந்த படைப்பாளர்களின் சிறுகதையில் வெளிப்படும் சமூகச்சிந்தனைகளை அறிந்து விழிப்புணர்வைப் பெறுதல்					K3
4	தற்கால இலக்கியங்களான புதுக்கவிதை> சிறுகதை தோன்றி வளர்ந்த பின்புலத்தையறிதல். மொழியைப் பிழையின்றி பேச எழுத கற்கத்தேவையான தமிழ் இலக்கணத்தின் இன்றியமையாமையை உணர்தல்					K1, K3
5	நடைமுறை வாழ்வியலுக்குத் தேவைப்படும், ஆங்கிலக் கடிதத்தை தமிழாக்கம் செய்தலுக்கான பயிற்சி அடைதல்.					K2, K3
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1	செய்யுள்				20 -- hours	
1. பாரதியார் : எங்கள் தாய் 2. பாரதிதாசன் : தமிழின் இனிமை 3. கண்ணதாசன் : ஒரு கந்தல் துணியின் கதை 4. சிற்பி பாலசுப்பிரமணியம் : ஓடு.ஓடு.சங்கிலி 5. தமிழ்ஒளி : வருங்கால மனிதன் வருக! 6. வைரமுத்து : இது வித்தியமான தாலாட்டு						
Unit:2	செய்யுள்				20 -- hours	
1. பச்சியப்பன் : காலம் பிரசவித்த மற்றொரு காலம் 2. பழநி பாரதி : காடு 3. தேவயாணி : இயற்கைக்குத் திரும்புவோம் 4.. செல்வகுமாரி : இலக்கியத்தில் பெண்கள்						

5. அறிவுமதி : ஹைக்கூக் கவிதைகள்		
6. நாட்டுப்புறப்பாடல்கள் : தாலாட்டு, தொழிற் பாடல்கள்		
Unit:3	சிறுகதை	20-- hours
தேர்ந்தெடுக்கப்பட்ட சிறுகதைகள்- நியூ செஞ்சரி புக் ஹவுஸ் வெளியீடு, சென்னை. அலைபேசி எண்.9047571857		
Unit:4	இலக்கிய வரலாறு	10 - hours
1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2. ஹைக்கூக் கவிதைகள் 3. பாரதி, பாரதிதாசன் இலக்கியப் பணி 4. சிறுகதையின் தோற்றமும் வளர்ச்சியும்		
Unit:5	இலக்கணம்	20 -- hours
1. வல்லினம் மிகுமிடம் 2. வல்லினம் மிகாவிடம் 3. தொடரில் வழுவச் சொற்களை நீக்கி எழுதுதல் 4. ஒருமை பன்மை மயக்கம் நீக்கி எழுதுதல் 5. மொழிபெயர்ப்புப் பகுதி - ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல் பொதுப்பகுதி , அலுவலகப்பகுதி		
Course Designed By: முனைவர் ஆர்.நிர்மலா தேவி		

French 2020-21 onwards - Affiliated Colleges - Annexure No. 11A
SCAA DATED: 23.09.2020

First Semester – Paper I

Course: French 1

Course Code:

Credits: 4

Hours: 90

Course Objectives:

To understand, speak, read and write simple, standard speech which is very slow and is carefully articulated and can recognize familiar words and very basic phrases concerning themselves, their family and immediate concrete surroundings when people speak slowly and clearly

Course Outcomes:

S.No	Course Outcome	Blooms Level
CO1	Comprehend basic vocabulary	K1
CO2	Understand basic syntax and grammar patterns	K2
CO3	Converse slowly in known situations	K3
CO4	Translate small basic sentences	K4

Syllabus:

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	
Page 5 of 17	

French 2020-21 onwards - Affiliated Colleges - Annexure No. 11A
SCAA DATED: 23.09.2020

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

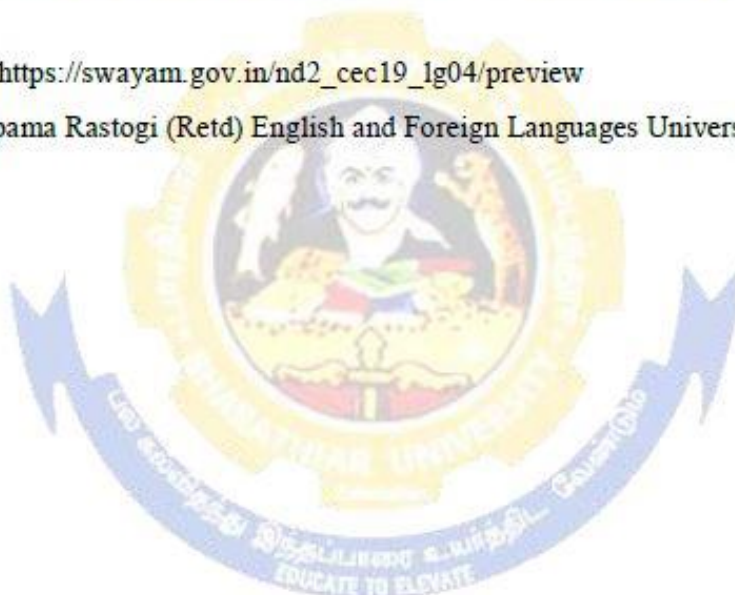
Author: Yves Loiseau, Régine Merieux

Publisher: French and European Publications Inc

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

SWAYAM : https://swayam.gov.in/nd2_cec19_1g04/preview

by Prof. Nirupama Rastogi (Retd) English and Foreign Languages University, Hyderabad



Part II English 2020-21 onwards - Affiliated Colleges - Annexure No.6(b)
SCAA DATED: 23.09.2020

Course code	12E]	PART II – ENGLISH-I	L	T	P	C
PART II ENGLISH		COMMUNICATIVE ENGLISH	4	-	-	4
Pre-requisite		Basic knowledge of English language	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						

Part II English 2020-21 onwards - Affiliated Colleges - Annexure No.6(b)
SCAA DATED: 23.09.2020

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 and pie charts - Writing short essays using the language of comparison and contrast 3. Grammar in Context: Voice (showing the relationship between Tense and Voice)		

Part II English 2020-21 onwards - Affiliated Colleges - Annexure No.6(b)
SCAA DATED: 23.09.2020

Unit:6	Contemporary Issues	2 hours
	Total Lecture hours	75hours
Text Book(s)		
COMMUNICATIVE ENGLISH –TANSCHÉ		
Reference Books		
1		
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	https://onlinecourses.nptel.ac.in/noc20_hs14/preview	
Course Designed By:		

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 are available for iteration in C					K3
4	Demonstrate the concept of User defined functions , Recursions , Scope and Lifetime 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 Functions- Nesting of Functions - Recursion – Passing Arrays and Strings to Functions - The						

Scope, Visibility and Lifetime of Variables- Multi file Programs. Structures and Unions		
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, Second Reprint 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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	S	M	S	L
CO3	S	M	S	M	M	L	S	L	S	L
CO3	S	S	S	M	M	M	S	M	S	M
CO4	S	S	S	M	S	M	S	M	S	M
CO5	S	S	S	M	M	M	S	M	S	M

*S-Strong; M-Medium; L-Low

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 computer knowledge		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 unit operations.					K2
4	Compare the functions of the memory organization					K4
5	Analyze architectures and computational designs concepts related to architecture organization 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 – Output Processor: 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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	M	M	L
CO3	S	M	S	M	M	S	M	M	M	L
CO3	S	S	S	M	S	S	S	M	M	M
CO4	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	S	M	S	S

*S-Strong; M-Medium; L-Low

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 C programming						
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 Prime numbers & Fibonacci Series (Program-1,2,3)					K1, K2
2	Apply the concepts to print the Magic square, Sorting the data , Strings, Recursive functions 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 university pattern.						
10. Write a function using pointers to add two matrices and to return the resultant matrix to the calling function.						
11. Write a C program which receives two filenames as arguments and check whether the file contents 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. At the 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, Second Reprint 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:	

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	L	M	S	S	S	L
CO3	S	S	S	M	L	M	S	S	S	M
CO3	S	S	S	L	L	M	S	S	S	L
CO4	S	S	S	M	L	M	S	S	S	M

*S-Strong; M-Medium; L-Low



BHARATHIAR UNIVERSITY: COIMBATORE-641

046B.Sc. CS/IT/CT/SS/MM/CSA &BCA

(For the students admitted from the academic year 2011-2012 and onwards)

CBCS PATTERN

ALLIED SUBJECTS

Course	BSc CS, IT, CT, SS, CSA, MM & B.C.A (Regular)
Effective from	2011-2012 and Onwards
Semester	I
Subject	Allied 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 :

- Understanding the concepts of mathematics
- Learning 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 Jordan, Gauss Seidal methods. The solution of Numerical Algebraic & Transcendental equation – Bisection method – Newton – Rapson method – false position method.

UNIT – III: Numerical Differentiations – Newton's forward Difference - Backward Difference – Startling formula Numerical Integration – Trapezoidal Rule & Simpson's rule Numerical solutions of ordering differential Equations – Taylor series & Runge kutta method

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

UNIT – V: Regression and Correlation – Types of relationship – Linear regression – Correlation – Coefficient of correlation – Regression equation of variables – Discrete Probability distribution – Uniform, Binomial & poisson Distribution

TEXT BOOKS:

1. Engineering Mathematics Volume II – Dr M.K. Venkataraman – NPC (Unit I)
2. Numerical Methods in science & Engineering - M.K. Venkataraman – NPC ,Revised Edition -2005 (Unit II & III)
3. Business Statistics - S.P. Gupta & M.P. Gupta Sultan Chand and Sons (Unit IV & V)

REFERENCE BOOKS:

1. Numerical methods – E. Balagurusamy Tata MC Graw Hill.
2. Fundamental of Mathematical statistics S C Gupta, V. K. Kapoor Sultan Chand and Sons

ENVIRONMENTAL STUDIES
FOR UNDER GRADUATE COURSES OF ALL
BRANCHES
OF HIGHER EDUCATION

SYLLABUS

Unit 1 : Multidisciplinary nature of environmental studies

Definition, scope and importance

(2 lectures)

Need for public awareness.

Unit 2 : Natural Resources :

Renewable and non-renewable resources :

Natural resources and associated problems.

a) Forest resources : Use and over-exploitation, deforestation, case studies.

Timber extraction, mining, dams and their effects on forest and tribal people.

b) Water resources : Use and over-utilization of surface and ground water,

floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources : Use and exploitation, environmental effects of extracting

and using mineral resources, case studies.

d) Food resources : World food problems, changes caused by agriculture and

overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water

logging, salinity, case studies.

e) Energy resources : Growing energy needs, renewable and non renewable

energy sources, use of alternate energy sources. Case studies.

f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

• Role of an individual in conservation of natural resources.

• Equitable use of resources for sustainable lifestyles.

Unit 3 : Ecosystems

- *Concept of an ecosystem.*

Structure and function of an ecosystem.

- *Producers, consumers and decomposers.*
- *Energy flow in the ecosystem.*
- *Ecological succession.*
- *Food chains, food webs and ecological pyramids.*
- *Introduction, types, characteristic features, structure and function of the*

following ecosystem :-

- a. Forest ecosystem*
- b. Grassland ecosystem*
- c. Desert ecosystem*
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)*

Unit 4 : Biodiversity and its conservation

- *Introduction – Definition : genetic, species and ecosystem diversity.*
- *Biogeographical classification of India*
- *Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values*
- *Biodiversity at global, National and local levels.*
- *India as a mega-diversity nation*
- *Hot-spots of biodiversity.*
- *Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.*
- *Endangered and endemic species of India*
- *Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.*

Unit 5 : Environmental Pollution

Definition

- *Cause, effects and control measures of :-*
- a. Air pollution*
 - b. Water pollution*
 - c. Soil pollution*
 - d. Marine pollution*
 - e. Noise pollution*

f. Thermal pollution

g. Nuclear hazards

- *Solid waste Management : Causes, effects and control measures of urban and*

industrial wastes.

- *Role of an individual in prevention of pollution.*

- *Pollution case studies.*

- *Disaster management : floods, earthquake, cyclone and landslides.*

Unit 6 : Social Issues and the Environment

- *From Unsustainable to Sustainable development*

- *Urban problems related to energy*

- *Water conservation, rain water harvesting, watershed management*

- *Resettlement and rehabilitation of people; its problems and concerns.*

Case

Studies

- *Environmental ethics : Issues and possible solutions.*

- *Climate change, global warming, acid rain, ozone layer depletion, nuclear*

accidents and holocaust. Case Studies.

- *Wasteland reclamation.*

- *Consumerism and waste products.*

- *Environment Protection Act.*

- *Air (Prevention and Control of Pollution) Act.*

- *Water (Prevention and control of Pollution) Act*

- *Wildlife Protection Act*

- *Forest Conservation Act*

- *Issues involved in enforcement of environmental legislation.*

- *Public awareness.*

Unit 7 : Human Population and the Environment

- *Population growth, variation among nations.*

- *Population explosion – Family Welfare Programme.*

- *Environment and human health.*

- *Human Rights.*

- *Value Education.*

- *HIV/AIDS.*

- *Women and Child Welfare.*
- *Role of Information Technology in Environment and human health.*
- *Case Studies.*

Unit 8 : Field work

- *Visit to a local area to document environmental assetsriver/
forest/grassland/hill/mountain*
- *Visit to a local polluted site-Urban/Rural/Industrial/Agricultural*
- *Study of common plants, insects, birds.*
- *Study of simple ecosystems-pond, river, hill slopes, etc. (Field work
Equal to 5
lecture hours)*



Second Semester

Course code	21T	TITLE OF THE COURSE	L	T	P	C
Core/Elective/Supportive		PART - I TAMIL – PAPER - II	3	-	-	3
Pre-requisite			Syllabus Version	2020 - 21		
Course Objectives:						
The main objectives of this course are to:						
மாணுட விழுமியங்களைப் போற்றி ஆன்மிகச் சிந்தனையை வளர்த்தல்						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	அற இலக்கியங்கள் வழி ஒழுக்கங்களைக் கற்றுத் தருதல்					K1,K2
2	பக்தியிலக்கியங்கள் வழி பக்திநெறிகளை உணர்த்துதல்.					K2
3	தமிழில் உரைநடை இலக்கியப் படைப்பாளர்களின் சிந்தனைகளை எடுத்துரைத்தல்.					K3
4	பிழையின்றி எழுத இலக்கணங்களைக் கற்றுத் தருதல்					K1,K3
5	தமிழ் இலக்கிய வரலாற்றில் அற இலக்கியம் மற்றும் உரைநடையின் தமிழ்ப்பணியை அறிதல்					K2,K3
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1	செய்யுள்					20 -- hours
1. திருக்குறள் – <ul style="list-style-type: none"> 1. இனியவை கூறல் 2. உழவு 3. குறிப்பறிதல் (காமத்துப்பால்) 2. நாலடியார் – சுற்றந்தழால் 3. நான்மணிக்கடிகை - 10 பாடல்கள் (11, 13, 29, 48, 66, 83, 85, 94, 100, 105)						
Unit:2	செய்யுள்					20 -- hours
1. தமிழ் விடு தூது : முதல் 25 கண்ணிகள் 2. நாச்சியார் திருமொழி : வாரணமாயிரம் எனத் தொடங்கும் 11 பாடல்கள் 3. மாணிக்கவாசகர் : திருவம்மாளை 4. சித்தர் பாடல்கள் 5. காளமேகப்பூலவர் பாடல்கள்						
Unit:3	உரைநடை					20 -- hours
1. கலைகள் : உ.வே. சாமிநாத ஐயர் 2. தமிழர் பண்பாடு : டாக்டர் சோ.நா.கந்தசாமி						

3. இணையத்தமிழ் வளர்ச்சி : முனைவர் ப.அர.தக்கீரன்		
4. திருக்குறள் நெறியில் அறிவாண்மை : திருப்பெருந்திரு சாந்தலிங்க இராமசாமி அடிகளார்		
5. கொங்கு நாட்டார் தமிழ்ப்பணி: காப்பியப் புலவர்கள் : முனைவர் இரா.கா. மாணிக்கம்.		
Unit:4	இலக்கணம்	15 -- hours
1. வினா விடை வகைகள் (அறு வகை வினா, எண் வகை விடை)		
2. ஆகுபெயர் விளக்கம் • பயன்பாடு வகைகள் 10		
Unit:5	இலக்கிய வரலாறு	15 -- hours
1. பதினெண் கீழ்க்கணக்கு நூல்கள்		
2. உரைநடையின் தோற்றமும் வளர்ச்சியும்		
பயிற்சிக்குரியன: விண்ணப்பங்கள் • மடல்கள் எழுதச் செய்தல்		
Course Designed By: முனைவர் ஆர்.நிர்மலா தேவி		

Second Semester – Paper 2

Course: French 2

Course Code:

Credits: 4

Hours: 90

Course Objectives:

To understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type

Course Outcomes:

S.No	Course Outcome	Blooms Level
CO1	Comprehend day to day conversations	K1
CO2	Understand basic culture and literature of France	K2
CO3	Converse confidently in known situations	K3
CO4	Translate small paragraphs of known context	K4

Syllabus:

Part 1 - French 2	
Unit No.	Topics
1	Etape 5 (Leçons 1 - 3)
2	Etape 6 (Leçons 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	

French 2020-21 onwards - Affiliated Colleges - Annexure No. 11A
SCAA DATED: 23.09.2020

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

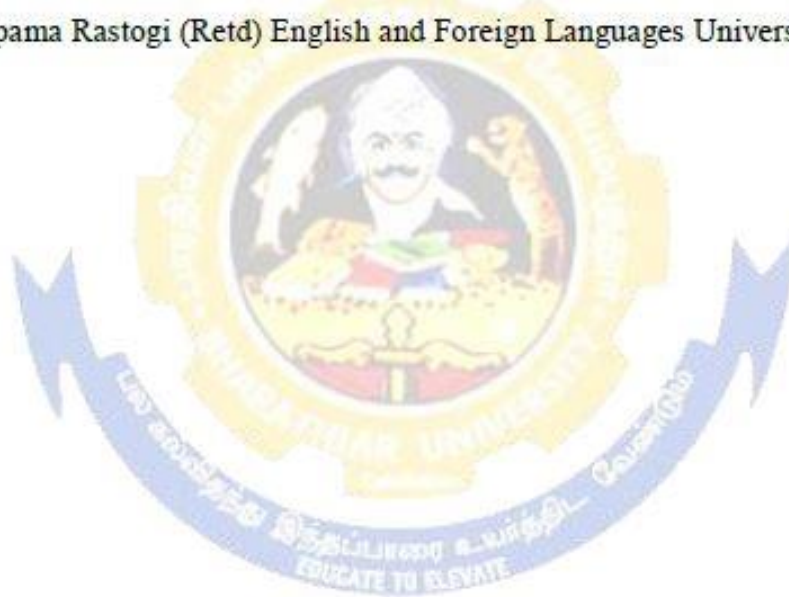
Author: Yves Loiseau, Régine Merieux

Publisher: French and European Publications Inc

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

SWAYAM : https://swayam.gov.in/nd2_cec19_1g04/preview

by Prof. Nirupama Rastogi (Retd) English and Foreign Languages University, Hyderabad



Part II English 2020-21 onwards - Affiliated Colleges - Annexure No.6(b)
SCAA DATED: 23.09.2020

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 communications and 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/motivational idea. 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 of thanks. 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 of speech - simile, metaphor, personification etc. 3. Word Power a. Idioms & Phrases						

Part II English 2020-21 onwards - Affiliated Colleges - Annexure No.6(b)
SCAA DATED: 23.09.2020

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 presentation of 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 giving opinions 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 a formal 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 –TANSCHÉ	
Reference Books		

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 of inheritance.						
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 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 exception Handling					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 Initializing string 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++, Pearson Education, 2003.	
2		
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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	M	M	M	L
CO2	S	S	S	S	S	S	S	M	M	M
CO3	S	S	S	S	S	S	S	M	M	M
CO4	S	S	S	S	S	S	S	M	M	S
CO5	S	S	S	S	S	S	S	M	M	S

*S-Strong; M-Medium; L-Low

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 and computer 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 of inheritance.						
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 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 exception Handling					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..						
2. Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD (), SUB(), MUL(), DIV() to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.						
3. Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to 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 all the 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++, Pearson Education, 2003
2	
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:	

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	M	M	M	L
CO2	S	S	S	S	S	S	S	M	M	M
CO3	S	S	S	S	S	S	S	M	M	M
CO4	S	S	S	S	S	S	S	M	M	S
CO5	S	S	S	S	S	S	S	M	M	S

*S-Strong; M-Medium; L-Low

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 from other 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 for a 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 Google Docs.						
9. Create a registration form for your Department Seminar or Conference using Google Forms.						
10. Create a question paper with multiple choice types of questions for a subject of your choice, 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, 2 nd 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:	

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	S	S	S	M	M	S	L
CO2	S	M	S	S	S	S	S	S	S	M
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course	BSc CS, IT, CT, SS, CSA, MM & B.C.A (Regular)
Effective from	2016-2017 and Onwards
Semester	II
Subject	Allied 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 of sets-minsets- Algebra of sets and Duality-Inclusion and Exclusion principle

UNIT II: Mathematical logic – Introduction- propositional calculus –Basic logical operations- Tautologies-Contradiction-Argument-Method of 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

BHARATHIAR UNIVERSITY : COIMBATORE 641 046.

Value Education – Human Rights

(2 hours per week)

(FOR THE UNDER GRADUATE STUDENTS OF AFFILIATED COLLEGES

WITH EFFECT FROM 2008-2009)

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, neighbours, co-workers.

Character Formation Towards Positive Personality:

Truthfulness, Constructivity, 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, Asanas
- d. Activities:
 - (i) Moralisation of Desires
 - (ii) Neutralisation 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 Foeticide 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 Redressal
 - a. Violation by State
 - b. Violation by Individuals
 - c. Nuclear Weapons and terrorism
 - d. Safeguards.



Third Semester

Course code		Data Structures	L	T	P	C
Core/Elective/Supportive		Core: 4	6	0	0	4
Pre-requisite		Basic understanding of Data storage, retrieval and 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 efficient algorithms.						
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 algorithms for 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, Galgotia Publication.	
3	S.Lovelyn Rose, R.Venkatesan, Data Structures, Wiley India Private Limited,2015, 1 st Edition	
Reference Books		
1	Jean-Paul,Tremblay & Paul G.Sorenson , An Introduction to Data structures with Applications Tata McGraw Hill Company 2008, 2ndEdition.	
2	Samanta.D , Classic Data Structure Prentice Hall of India Pvt Ltd 2007, 9 th 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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	S	M	M	M
CO2	S	S	S	M	M	M	M	M	M	M
CO3	S	S	S	M	S	M	M	M	S	S
CO4	S	S	S	M	S	S	S	S	M	M
CO5	S	S	S	M	M	S	S	M	M	S

*S-Strong; M-Medium; L-Low

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 students to 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 oriented programming.						
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 and methods and their interaction with one another to attain a solution.						
4. Simultaneously it provides the syntax of programming language Java for solving the real world 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 and events					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 Classes together – 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, 5 th Edition, TMH.	
2	Herbert Schildt , Java: The Complete Reference, McGraw Hill Education, Oracle Press 10 th Edition, 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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	L	S	M	M	M
CO2	S	S	S	M	S	L	S	M	M	M
CO3	S	S	S	M	S	M	S	S	M	M
CO4	S	S	S	M	S	M	M	S	M	M
CO5	S	S	S	M	S	M	S	S	M	M

*S-Strong; M-Medium; L-Low

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 concept and 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 foundation on programming concepts and its applications through hands-on training.						
4. To practice the Basic concepts, Branching and Looping Statements and Strings in C programming						
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 and principles of professional coding					K1, K2
2	Demonstrate the creation of objects, classes and methods and the concepts of constructor, methods overloading, Arrays, branching and 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 and Exception 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 extracted string.						
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 three multiplication 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 qualification and 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, 5 th Edition, TMH.	
2	Herbert Schildt , Java: The Complete Reference, McGraw Hill Education, Oracle Press 10 th Edition, 2018	
3	Programming with Java – A Primer – E. Balagurusamy, 3 rd Edition, TMH.	
Reference Books		
1	The Complete Reference Java 2 – Patrick Naughton & Hebert Schildt, 3 rd Edition, TMH	
2	Programming with Java – John R. Hubbard, 2 nd 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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	S	S	S	M	M	L
CO3	S	S	S	L	S	M	S	M	M	L
CO3	S	S	S	M	S	M	S	M	M	L
CO4	S	S	S	M	S	M	S	S	M	S
CO5	S	S	S	M	S	S	S	S	M	S

*S-Strong; M-Medium; L-Low

Course code		INTRODUCTION TO WEB DESIGN AND APPLICATIONS	L	T	P	C
Core/Elective/Supportive		Skill based Subject : 1	5	0	0	3
Pre-requisite		Basics of web pages, server and browser	Syllabus Version	2020-21 Onwards		
Course Objectives:						
The main objectives of this course are to:						
1. To enable the students to learn about web page design using HTML and other necessary components.						
2. To learn in news groups, mailing lists, chat rooms and MUDs for having forum discussion on any topics,						
3. To study the World Wide Web, Telnet and FTP.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the fundamentals of Electronic mail, web page installation and set up.					K2
2	Understand the basics of internet, internet congestion, culture and WWW.					K2-K3
3	Understand the world wide web, searching in WWW, telnet and FTP.					K4
4	Knowledge on basics of HTML, HTML tags, tables, frames, CSS and next generation HTML.					K3
5	Knowledge on news groups, mailing list, chat rooms and MUDs.					K1-K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1	FUNDAMENTALS OF ELECTRONIC MAIL				15 hours	
Introduction - Email: Advantages and Disadvantages - Userids, Passwords and Email addresses - Message Components – Message Composition - Mailer Features - E mail Inner Workings - Email Management - MIME Types. Browsing and Publishing: Introduction – Browser bare bones – Coast – to – Coast surfing – Hyper Text Markup Languages – Web page installation – Web page set up – HTML formatting and hyper link creation						
Unit:2	THE INTERNET				12 hours	
The internet: Introduction – internet defined – internet history – the way the internet works – internet congestion – Internet culture – Business culture and the internet – collaborative computing and the internet. World Wide Web: introduction the web defined – web browser details – web writing styles – web presentation outline, design, and management – registering web pages.						
Unit:3	SEARCHING THE WORLD WIDE WEB				15 hours	
Searching the world wide web: introduction – directories, search engines and metasearch engines – search fundamentals – search strategies – how does a search engine works. Telnet and FTP: introduction – telnet and remote login – File transfer – Computer Viruses.						
Unit:4	BASIC HTML				15 hours	
Basic HTML: introduction – semantic versus syntactic – based style types – headers and footers – lists – tables – debugging. Advanced HTML: introduction – frames – html forms – CGI scripts – dynamic documents – html tools – next generation html – cascading style sheets						

Unit:5	NEWS GROUPS, MAILING LISTS, CHAT ROOMS AND MUDs	15 hours
News groups, Mailing Lists, Chat rooms and MUDs: introduction – news groups and mailing lists history – mailing list fundamentals – newsgroups and mailing lists availability – chat-rooms – MUDs. Electronic Publishing: introduction – electronic publishing advantages and disadvantages – copy right issues – project Gutenberg and on-line books – electronic journals , magazines and news papers – miscellaneous publishing issues.		
	Total Lecture hours	75 hours
Text Book(s)		
1	Raymond Greenlaw, Ellen Hepp, Fundamentals of the INTERNET and the World Wide Web, Second Edition , Tata McGraw Hill, 2005	
2	Guy W. Lecky-Thompson, “Web Programming”, Cengage Learning, 2008.	
Reference Books		
1	Chris Bates, “Web Programming: Building Internet Applications”, Third Edition, Wiley India Edition, 2007	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1		
2		
3		
Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	M	S	S	S	S	M
CO2	S	S	S	S	S	S	S	S	L	S
CO3	S	S	M	S	S	M	S	M	S	S
CO4	S	S	S	S	S	M	S	S	S	M
CO5	S	S	S	M	S	S	L	S	S	S

*S-Strong; M-Medium; L-Low

Allied Paper 3 – IT/CT: MICROPROCESSOR AND ALP

UNIT I	<p>Introduction to microprocessors : Evolution of microprocessors – Single-chip Microcomputer – Embedded Microprocessors – Bit- Slice processors – Microprogramming – RISC and CISC Processors – Scalar and Superscalar Processors – Vector Processors – Array Processors – Symbolic Processors – Digital Signal Processors</p> <p>Intel 8086 – Pin Description of Intel 8086 – Operating modes of 8086 – Register organization of 8086 – BIU and EU – Interrupts – 8086 based computer system – Addressing Modes of 8086</p>
UNIT II	<p>8086 Instruction Set – Instruction Groups – Addressing Mode Byte – Segment Register Selection – Segment Override – 8086 Instructions Assembly Language Programs for 8086: Largest Number, Smallest Number in a Data Array – Numbers in Ascending and Descending order – Block Move or Relocation – Block Move using REP instruction – Sum of a series – Multibyte Addition</p>
UNIT III	<p>Intel 386 and 486 Microprocessors: Intel 386 and 486 Microprocessor – 486DX Architecture – Register Organization of 486 Microprocessor – Memory Organization – Operating Modes of Intel 486 – Virtual Memory – Memory Managment Unit – Gates – Interrupts and Exceptions – Addressing Modes of 80486 – Pin Configuration</p>
UNIT IV	<p>Input devices – Output devices – Memory and I/O addressing – 8086 Addressing and Address Decoding – Programmable I/O Ports – DMA Data Transfer. Other Microprocessors – PowerPC Microprocessors – Pentium Microprocessors – Pentium Pro microprocessor – Alpha Microprocessor – Cyrix Microprocessor – MIPS Microprocessor – AMD Microprocessor</p>
UNIT V	<p>MOTOROLA 68000, MOTOROLA 68020, MOTOROLA 68030, MOTOROLA 68040</p> <p>Interfacing of A/D Converter and Applications: Introduction – Interfacing of ADC 0808 or ADC 0809 to Intel 8086 – Bipolar to Unipolar Converter – Sample and Hold Circuit, LF 398 – Microprocessor-based Measurement and Control of Physical Quantities</p>
Text Book(s)	<p>Badri Ram, — Advanced Microprocessors and InterfacingI, Tata McGraw-Hill Publishing Company Limited, Fourteenth reprint, 2007</p>
Ref. Book(s)	<p>A.K. Ray, K.M. Bhurchandi, — Advanced Microprocessors and PeripheralsI, Tata McGraw-Hill Publishing Company Limited, Second Edition, 2007</p>

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

பாரதியார் பல்கலைக்கழகம் : கோயமுத்தூர்

பகுதி - IV : சிறப்புத் தமிழ் தாள் - 1

முன்றாம் பருவம்

**இளங்கலை 2010-11 கல்வி ஆண்டு முதல் சேர்வோர்க்குரியது
(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு)**

- கூறு - 1 : பாரதியார் கவிதைகள்
கண்ணன் என் சேவகன்
பாரதிதாசன் - அழகின் சிரிப்பு (முயுவதம்)
மீரா (கவிஞர்) - குக்கூ (புதுக்கவிதை)
- கூறு - 2 : மொழித் திறன்
பிழைநீக்கி எழுதுதல் - றன ர வேறுபாடு அறிதல்
ளன, ழன, லன வேறுபாடு அறிதல்
ன, ண, ந வேறுபாடு அறிதல்
குறில் நெடில் வேறுபாடு அறிதல்
- கூறு - 3 : கடிதங்கள் எழுதுதல் - பாராட்டுக் கடிதம், நன்றிக்கடிதம்
அழைப்புக்கடிதம், அலுவலக விண்ணப்பம்.
- கூறு - 4 : சொற்களைத் தந்து தொடர்களை அமைக்கும் பயிற்சி அளித்தல்
வல்லினம் மிகும் திடங்கள்.
- கூறு - 5 : பாடந்தயூவிய வரலாறு.

**2010-2011 கல்வியாண்டு முதல் பயில்பவர்களுக்கு பின்வரும் வினாத்தாள்
அமைப்பு பின்பற்றப்பட வேண்டும்.**

Maximum 50 Marks – wherever applicable			
Section A	Multiple choice questions with four options	10*1=10	10 questions – 2 each from every unit
Section B	Short answer questions of either / or type (like 1.a (or) b)	5*3=15	5 questions – 1 each from every unit
Section C	Essay-type questions of either / or type (like 1.a (or) b)	5*5=25	5 questions – 1 each from every unit
NOTE: In Section “C” one of the questions shall be application oriented or a problem or a case study.			



Fourth Semester

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 in computer.		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 implementation of language processor.						
2. To enhance the ability of program generation through expansion and gain knowledge about Code 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 file management					K2
5	Analyze the need for scheduling algorithms and implement different algorithms used for representation, scheduling, and allocation in DOS and UNIX operating system.					K1-K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1						
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						
Unit:2		MACHINE AND COMPILER	15 hours			
Machine dependent compiler features - Intermediate form of the program - Machine dependent code optimization - Machine independent compiler features - Compiler design options - Division into passes – Interpreters – p-code compilers - Compiler-compilers.						
Unit:3						
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						
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, Third Edition.	
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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	S	M	M	M	M	L
CO2	S	S	S	S	S	M	M	M	S	L
CO3	S	M	M	M	S	M	S	S	S	L
CO4	S	S	S	M	S	S	S	M	M	M
CO5	S	S	S	M	S	S	S	M	M	M

*S-Strong; M-Medium; L-Low

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 an operating 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 interact with 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 it from 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 Unix commands.					K3
5	Build Regular expression to perform pattern matching using utilities and implement 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 Commands in LINUX.						
Unit:3						
VI EDITOR			15 hours			
Creating files using the vi editor: Text editors – The vi editor. Managing Documents: Locating files 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, 1 st Edition	
Reference Books		
1	Richard Petersen, Linux: The Complete Reference, Sixth Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, Edition 2008.	
2		
3		
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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	S	M	M	M	M	L
CO2	S	S	S	M	S	M	M	M	M	L
CO3	S	S	S	M	S	M	S	S	S	M
CO4	S	S	S	M	S	M	S	S	S	M
CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

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 knowledge in 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 own shell 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 User Management					K1, K2
2	Understand and develop shell scripts using pipes, redirection, filters, Pipes and display system configuration					K2-K3
3	Develop simple shell scripts applicable to file access permission network administration					K3
4	Apply and change the ownership and file permissions using advance Unix commands.					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 , current working 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 by getting 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 line arguments.						
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, 1 st 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:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	M	M	M
CO3	S	S	S	M	S	M	S	S	M	M
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code		Lab – HTML, XML, JAVASCRIPT	L	T	P	C
Core/Elective/Supportive		Skill Based Subject 2 (Lab) : 1	0	0	4	3
Pre-requisite		Students should have basic knowledge in XML, XML and Java script	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to:						
1. To enable the students to develop web pages using HTML, java script and other necessary components.						
2. To study the XML, CSS and DTD to create XML based web applications.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of java script, HTML and XML, programming statements and design web pages.					K2-K6
2	Understand and apply the XML programming constructs, DTD and develop applications.					K2-K6
3	Understand the world wide web, searching in WWW, telnet and FTP.					K4
4	Knowledge on basics of HTML, HTML tags, tables, frames, CSS and next generation HTML.					K2-K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Programs			36 hours			
1. Design Simple Web Pages using standard HTML tags like, HEAD, TITLE, BODY.						
2. Design HTML web pages, which make use of INPUT, META, SCRIPT, FORM, APPLET, BGSOUND, MAP						
3. Working with various attributes of standard HTML elements						
4. Using JavaScript's Window and document objects and their properties and various methods like alert(), eval(), ParseInt () etc. methods to give the dynamic functionality to HTML web pages						
5. Writing JavaScript snippet which makes use of JavaScript's in-bulit as well as user defined objects like navigator, Date Array, Event, Number etc.						
6. Write code which does the form validation in various INPUT elements like TextFiled, Text Area, Password, Selection list etc.						
7. Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Declaration						
8. Usage of Internal DTD, External DTD, Entity Declaration.						
			Total Lecture hours		36 hours	
Text Book(s)						
1	Raymond Greenlaw, Ellen Hepp, Fundamentals of the INTERNET and the World Wide Web, Second Edition , Tata McGraw Hill, 2005					
Reference Books						
1	Brett McLaughlin, Java and XML, 2 nd edition, O'REILLY, 2006.					
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]						

1	
2	
3	
Course Designed By:	

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	M	S	M	M	M
CO3	S	S	M	S	S	M	S	S	M	M
CO3	S	M	S	M	S	M	S	S	M	M
CO4	S	S	M	M	S	S	M	M	M	M

*S-Strong; M-Medium; L-Low



MASTERING LAN AND TROUBLESHOOTING

Subject Description This Course presents the details of Local Area Networks.

Goals To enable the students to learn about the internal organization of a PC

Objective On successful completion of the course the students should have understood types of faults and how to solve the problems

UNIT I: PC- Hardware overview Introduction to computer organization-Memory-PC family-PC hardware- interconnections between Boxes- Inside the boxes:-motherboard, daughterboards, floppy disk drive, HDD, speaker, mode switch, front panel indicators & Control-mother board logic-memory space-I/O port address-wait state-interrupts -I/O data transfer-DMA channels-POST sequence.

UNIT II: PERIPHERAL DEVICES Floppy drive controller-Overview-Disk format-FDC system interface-FDD interface Hard Disk controller-overview-Disk Drives and interface-controller post description Hard disk card-Hard disk format. **Display Adapter:-**CRT display-CRT controller principle-CRT controller 6845 **Printer controller:-**Centronics interface-programming sequence -Hardware overview-printer-sub assemblers.

UNIT III: MOTHERBOARD CIRCUITS Mother board functions-functional units and intercommunications:-Reset logic -CPU nucleus logic-DMA logic-Wait state logic-NM logic-speaker logic-keyboard interface-SMPS.

UNIT IV: INSTALLATION AND MAINTENANCE Introduction-pre installation planning - installation practice-routine checks-special configuration memory upgradation-HD upgradation-DOS command (Internal and external). Preventive maintenance-system usage.

UNIT V: TROUBLESHOOTING Computer faults-nature of faults-types of faults-diagnostic programs and tools-fault elimination-systematic troubleshooting procedure mother board problem-serial port problems-FDC, HDC, display problems- display adapter-printer problem -monitor problems, HDC, FDC problems.

REFERENCE BOOKS:

1. B.Govindarajulu, "IBM PC and Clones", Tata McGraw Hill Co. 1995.
2. Robert C Brenner, "IBM PC Troubleshooting and Repair Guide", BPB publications.
3. Winn & Rosch, "Hardware Bible", Tech Media.
4. Ray Duncan, "DOS Programming".
5. Zacker, Upgrading & Troubleshooting Networks-The Complete Reference, Tata McGraw Hill edition.
6. Meyers, Introduction to PC Hardware and Troubleshooting, Tata McGraw Hill edition.

BHARATHIAR UNIVERSITY : COIMBATORE 641 046
PART-IV GENERAL AWARENESS
FOR B.A.,B.Sc., B.C.A., B.S.W., B.Com., B.B.M. and B.B.A. DEGREE EXAMINATIONS

CONTENTS

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

பாரதியாரர் பல்கலைக்கழகம் : கோயமுத்தூர்
பகுதி - IV: சிறப்புத் தமிழ் தாள் - 2
நான்காம் பருவம்
இளங்கலை 2010-11 கல்வி ஆண்டு முதல் சேர்வோர்க்குரியது
(12-ம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு)

- கூறு - 1 திருக்குறள் - ஒழிபியலில் முதல் 5 அதிகாரங்கள் மட்டும்
- கூறு - 2 எழுத்துப்பிழை நீக்க வழிகள் - பிழையும் திருத்தமும்
சொற்களைச் சரியாகப் பயன்படுத்தும் பாங்கு - வினைச் சொற்கள்
துணை வினைகள் (எழுத்துகாட்டுகளுடன் விளக்குதல்).
- கூறு - 3 வழக்கறிதல் : மரபு வழக்கு - இயல்பு வழக்கு - தகுதி வழக்கு அறிதல்
- கூறு - 4 படைப்பாற்றல் பயிற்சி
கட்டுரைகள் எழுதுதல்
- கூறு - 5 : தமிழ்ச்செம்மொழி வரலாறு

மொழி - விளக்கம் - மொழிக்குடும்பங்கள் - உலகச் செம்மொழிகள் - இந்தியச் செம்மொழிகள் - செம்மொழித் தகுதிகள் - வரையறைகள் - வாயும் தமிழ்ச்செம்மொழி - தமிழின் தொன்மை - தமிழின் சிறப்புகள் - தமிழ்ச் செம்மொழி நூல்கள்.
தமிழ்ச் செம்மொழி அறிந்தேற்பு - பரிதியாற் கலைஞர் அவர்கள் முதல் கலைஞர் திரு. மு. கருணாநிதி அவர்கள் வரை (அறிஞர்கள் - அமைப்புகள் - நிறுவனங்கள் - இயக்கங்கள் தொடர் முயற்சிகள் - அறப்போராட்டங்கள் - உலகத் தமிழ்ச் செம்மொழி மாநாடு, கோவை-2010).

பார்வை நூல்கள் (அலகு -5)

1. கலைஞர் மு. கருணாநிதி, செம்மொழி வரலாற்றில் சில செப்பேடுகள்.
2. ஆய்வரங்கர் சிறப்புமலர், உலகத் தமிழ்ச் செம்மொழி மாநாடு, கோவை-2010.
3. உலகத் தமிழ்ச் செம்மொழி மாநாட்டுச் சிறப்பு மலர், கோவை-2010.
4. சாலினி இளந்திரையன், தமிழ்ச் செம்மொழி ஆவணம், மணிவாசகர் பதிப்பகம், சென்னை, 2005.
5. கால்நெல், "திராவிட மொழிகளின் ஒப்பிலக்கணம்", கழக வெளியீடு, சென்னை.

குறிப்பு: கூறு-5க்கு உரிய பாடங்கள் பாடத்திட்டக்குவினால் உருவாக்கப்பட்டுள்ளது. அவை இத்துடன் இணைக்கப்பட்டுள்ளன.



Fifth Semester

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 suitable application development. 5. Provide strong foundation of database concepts and to introduce students to application development 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 of handling multiple tables					K1-K3
5	Attain a good practical skill of managing and retrieving of data using Data 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	
Oracle9i: 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 - iSQL *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., 6 th 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	
3		
Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	M	M	M	L
CO2	S	S	S	M	S	M	M	M	M	L
CO3	S	S	S	S	S	S	S	S	M	M
CO4	S	S	S	S	S	M	S	S	M	L
CO5	S	S	S	S	S	M	S	S	M	L

*S-Strong; M-Medium; L-Low

Course code		Visual Basic	L	T	P	C
Core/Elective/Supportive	Core : 9		6	0	0	4
Pre-requisite	Knowledge in programming language and oops concept.		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 modern software 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 MS Access.						
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. Working with 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 ActiveX DLL 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 I to Unit IV)	
2	Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publishing House, Fourth Reprint, 2006. (Unit V)	
3		
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.	
3		
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
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Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	M	M	M	M	M	L
CO2	S	S	S	M	M	M	S	S	M	L
CO3	S	S	S	S	S	M	S	S	S	M
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

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 knowledge in 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 connectivity program.		
	Total Lecture hours	36 hours
Text Book(s)		
1	Visual Basic 6.0 Programming, Content Development Group, TMH, 8 th reprint, 2007. (Unit I to Unit IV)	
2	Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publishing House, Fourth Reprint, 2006. (Unit V)	
3	E-Book : Bill Pribyl, Steven Feuerstein, “Oracle PL/SQL Programming”, O’Reilly Media, Inc., 6 th Edition, February 2014.	
Reference Books		
1	Gray Cornell (2003), ”Visual Basic 6 from ground up” TMH, New Delhi, 1 st 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:		

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	M	L	S	M	M	L
CO3	S	S	S	L	M	M	S	M	S	L
CO3	S	S	S	M	S	M	S	S	S	M
CO4	S	S	S	M	S	M	S	S	M	M
CO5	S	S	S	S	S	S	S	S	S	M

*S-Strong; M-Medium; L-Low

Course code		SOFT COMPUTING	L	T	P	C
Core/Elective/Supportive		Elective : I	6	0	0	4
Pre-requisite		Basic knowledge in computing fundamentals	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to: 1. To enable the students to learn soft computing techniques neural networks, fuzzy logics and genetic algorithms. 2. To learn about hybrid models by integrating neural networks, fuzzy logic and genetic algorithms.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the fundamentals of neural networks, architecture, types of neural networks and its applications.					K2
2	Knowledge in associative memory and adaptive resonance theory.					K2,K3
3	Understand the fuzzy set theory and fuzzy systems, and applications of fuzzy systems.					K3
4	Knowledge in genetic algorithms, genetic modeling, convergence of genetic algorithms.					K3
5	Knowledge in the integration of neural networks, fuzzy logic and genetic algorithms to develop hybrid models.					K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1 FUNDAMENTALS OF NEURAL NETWORKS 10 hours						
Fundamentals of Neural Networks: Basic Concepts of Neural Networks, Human Brain, Model of an Artificial Neuron, Neural Network Architectures, Characteristics of Neural Networks, Learning Methods, Taxonomy of Neural Network Architectures, History of Neural Network Research, Early Neural Network Architectures, Some Application Domains. Back Propagation Networks: Architecture of a Back Propagation Network, Back Propagation Learning, Illustration, Applications.						
Unit:2 ASSOCIATIVE MEMORY 10 hours						
Associative Memory: Autocorrelators, Heterocorrelators, Exponential BAM, Associative Memory for Real-Coded Pattern Pairs, Applications, Recent Trends. Adaptive Resonance Theory: Introduction, ART1, ART2, Applications, Sensitives of Ordering of Data.						
Unit:3 FUZZY SET THEORY 10 hours						
Fuzzy Set Theory: Fuzzy Versus Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations. Fuzzy Systems: Crisp Logic, Predicate Logic, Fuzzy Logic, Fuzzy Rule Based Systems, Defuzzification Methods, and Applications.						
Unit:4 FUNDAMENTALS OF GENETIC ALGORITHMS 12 hours						
Fundamentals of Genetic Algorithms: Genetic Algorithms: History, Basic Concepts, Creation of Offsprings, Working Principle, Encoding, Fitness Function, Reproduction. Genetic Modeling: Inheritance Operators, Cross Over, Inversion, And Deletion, Mutation Operator, Bit-Wise Operators, Bit-Wise Operators used in GA, Generational Cycle, Convergence of Genetic						

Algorithms.		
Unit:5	INTEGRATION OF NEURAL NETWORKS, FUZZY LOGIC AND GENETIC ALGORITHMS	12 hours
Integration of Neural Networks, Fuzzy Logic and Genetic Algorithms: Hybrid Systems, Neural Networks, Fuzzy Logic, and Genetic Algorithms Hybrids, Preview of Hybrid Systems.		
	Total Lecture hours	55 hours
Text Book(s)		
1	S.Rajasekaran, G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic, and Genetic Algorithms, PHI Learning, 2010.	
Reference Books		
1	Klir.G, Yuan B.B. Fuzzy Sets and Fuzzy Logic, Prentice Hall of India, 1997.	
2	Laurance Fausett, Fundamentals of Neural Networks, Prentice Hall, 1992.	
3	Gen, M. and R. Cheng, Genetic Algorithm and Engineering Design, John Wiley, 1997.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
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Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	M	M	M
CO2	S	S	S	S	S	M	M	M	M	M
CO3	S	S	S	M	S	M	M	M	M	M
CO4	S	S	S	M	S	L	M	M	L	L
CO5	S	S	S	M	S	L	M	M	L	L

*S-Strong; M-Medium; L-Low

Course code		ANIMATION TECHNIQUES	L	T	P	C
Core/Elective/Supportive		Elective : I	6	0	0	4
Pre-requisite		Basic knowledge in 2D and 3D animations	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to: 1. To learn the animation and its uses, types and techniques of animation. 2. To enable the students to learn 3D animation in FLASH. 3. To understand the concept of motion in 3D animation 4. To make the student to create 3D animated movies.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of animation, need of animations, types of animation, techniques of animation and special effects.					K2
2	Understand and apply animations in flash, working with time time-line and frame based animations, tween-based animations and layers.					K3
3	Knowledge on working with time-line, frame-based and tween-based animation.					K3
4	Understanding the motion caption, software to capture the motion.					K4
5	Apply the animation concepts and concept development to develop or create 3D animated movies.					K4-K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create						
Unit:1		BASICS			15 hours	
What is meant by Animation – Why we need Animation – History of Animation – Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects - Creating Animation.						
Unit:2		CREATING ANIMATION IN FLASH			15 hours	
Creating Animation in Flash: Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation - Working with the Timeline and Tween-based Animation – Understanding Layers - Actionscript.						
Unit:3		3D ANIMATION & ITS CONCEPTS			15 hours	
3D Animation & its Concepts – Types of 3D Animation – Skeleton & Kinetic 3D Animation – Texturing & Lighting of 3D Animation – 3D Camera Tracking – Applications & Software of 3D Animation.						
Unit:4		MOTION CAPTION			15 hours	
Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Software_s – Script Animation Usage – Different Language of Script Animation Among the Software.						
Unit:5		CONCEPT DEVELOPMENT			12 hours	
Concept Development –Story Developing –Audio & Video – Color Model – Device Independent Color Model – Gamma and Gamma Correction - Production Budgets - 3D Animated Movies.						

	Total Lecture hours
	75 hours
Text Book(s)	
1	Principles of Multimedia, Ranjan Parekh, 2007, TMH. (Unit I, Unit V)
2	Multimedia Technologies, Ashok Banerji, Ananda Mohan Ghosh, McGraw Hill Publication
Reference Books	
1	Ze-Nian Li and Mark S.Drew, "Fundamentals of Multimedia", First Edition, Pearson Education, 2007
2	Prabhat K Andleigh, Kiran Thakrar, "Multimedia systems design", First Edition, PHI, 2007
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
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Course Designed By:	

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	S	M	L	M	S	S
CO2	S	M	S	L	S	M	L	M	S	S
CO3	S	S	S	L	M	M	L	M	M	S
CO4	S	S	S	M	S	M	L	M	M	S
CO5	S	S	S	L	S	M	L	M	M	S

*S-Strong; M-Medium; L-Low

Course code		BUSINESS INTELLIGENCE	L	T	P	C
Core/Elective/Supportive		Elective : I	6	0	0	4
Pre-requisite		Basic knowledge in data, data base and information	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to:						
3. To enable the students to learn business intelligence concepts, data warehouses, data mining techniques for CRM.						
4. To learn about text mining and web mining and its applications.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of business intelligence, business decisions, data warehouses and its architecture, KDD process.					K2
2	Understand the applications of data mining in business, data mining techniques for CRM, text mining and web mining.					K2,K3
3	Knowledge in business intelligence, application in various domains and best practices.					K3
4	Understand the knowledge management, its architecture, approaches and tools.					K3
5	Knowledge in Web analytics and business intelligence, eCRM and case studies in web analytics.					K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1						
INTRODUCTION TO BUSINESS INTELLIGENCE			15 hours			
Introduction to business intelligence and business decisions – Data warehouses and its role in Business Intelligence – Creating a corporate data warehouse – Data Warehousing architecture – OLAP vs. OLTP - ETL process – Tools for Data Warehousing – Data Mining – KDD Process						
Unit:2						
APPLICATIONS			15 hours			
Applications of Data Mining in Business – Data Mining Techniques for CRM – Text Mining in BI - Web Mining – Mining e-commerce data – Enterprise Information Management - Executive Information Systems						
Unit:3						
BUSINESS INTELLIGENCE			15 hours			
Business Intelligence – Function, Process, Services & Tools - Application in different domains – Operational BI - Customizing BI – Managing BI projects vs. Traditional IS projects – Managing BI projects – Best Practices in BI Strategy						
Unit:4						
KNOWLEDGE MANAGEMENT			15 hours			
Knowledge Management – Definition – Data Vs. Information Vs. Knowledge – The ten key principle of KM – Knowledge Management Architecture – Knowledge Management Vs. Knowledge Processing – KM approaches – KM Tools – KM Infrastructure – KM models - KM Strategies						
Unit:5						
ANALYTICS			12 hours			
Web Analytics and Business Intelligence – eCRM - Case Study: Web Trends – Boeing – EverBank						

– China Eastern		
Unit:6	Contemporary Issues	3 hours
Expert lectures, online seminars - webinars		
	Total Lecture hours	75 hours
Text Book(s)		
1	Business Intelligence in the Digital Economy - Opportunities, Limitations and Risks, M.Raisinghani, Idea Group Publications, 2004	
2	Introduction to Data Mining and its Applications, Sumathy, Sivanandam, Springer Verlag, 2006	
Reference Books		
1	Knowledge Management and Business Innovation, Yogesh Malhotra, Idea Group, 2001	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
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Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	L	M	M	S	L	S	S	S	M	M
CO2	M	L	L	M	M	M	S	S	S	S
CO3	L	M	S	L	S	S	L	M	M	M
CO4	M	S	M	M	M	S	M	M	M	M
CO5	S	M	S	S	S	S	M	M	S	S

*S-Strong; M-Medium; L-Low

Course code		Dot Net Programming	L	T	P	C
Core/Elective/Supportive		Skill based Subject : 3	6	0	0	3
Pre-requisite	Basic knowledge in web programming and VB programming		Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to:						
1. To understand .NET framework to develop web centric applications.						
2. To enable students to learn the basics of I/O and object oriented programming.						
3. To familiar with VB.NET and ASP.NET IDE						
4. To learn about the ASP.NET controls and ADO.NET.						
5. To enable the students to learn how to build and deployment of web services.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of .NET framework and the object oriented programming.					K1
2	Understand the procedures, File I/O, Error handling and Message queues.					K2
3	Understand and remember the components in VB.NET IDE, ADO.NET and also the window forms.					K2
4	Understand the HTML server controls, Web controls, Validation controls and state management and tracing.					K3
5	Knowledge on SOAP, building web services and deploying and publishing web services, Finding and consuming web services.					K2-K4
K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create						
Unit:1						
Introduction to .NET Framework		15 hours				
Introduction to .Net: .NET framework- difference between VB6 and VB .Net-Object-Oriented programming and VB .Net-Data types-Variables-Operators-Arrays-Conditional logic.						
Unit:2						
File I/O, Object Oriented Concepts and Message Queues		15 hours				
Procedures- Dialog boxes- File IO and System objects- Error handling- Namespaces-Classes and Objects- Multithreading-Message Queue- Programming MSMQ.						
Unit:3						
VB.NET IDE and Controls		15 hours				
VB.Net IDE-Compiling and Debugging-Customizing- Data access: ADO.Net- Visual studio .Net and ADO .Net. Windows Forms: Controls-Specific controls- Irregular forms.						
Unit:4						
VB.NET & ASP.NET		15 hours				
VB.Net and web: Introduction to ASP .Net page framework- HTML server controls- Web controls- Validation controls- Events-CSS- State management- Tracing- Security.						
Unit:5						
Web Services		12 hours				
UNIT V: Web Services: Introduction- Infrastructure- SOAP-Building web services- Deploying and publishing web services- Finding and consuming web services						
Unit:6						
Contemporary Issues		3 hours				
Expert lectures, online seminars – webinars						

		Total Lecture hours	75 hours
Text Book(s)			
1	Bill Evjen, Jason Beres, et.al, Visual Basic .Net programming, Wiley Dreamtech India (p) Ltd. ISBN 81-265-0254-1. (Chapters: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50).		
Reference Books			
1	Fergal Grimes, Microsoft .NET for programmers, Shroff Publishers & Distributors (P) Ltd. ISBN 81-7366-540-0.		
2	Thuan Thai & Hoang Q.Lam, .NET Framework Essentials, Shroff Publishers & Distributors (P) Ltd. ISBN 81-7366-654-7		
3			
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]			
1			
2			
3			
Course Designed By:			

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	S	L	M	M	M	M	M	L
CO2	M	S	L	M	M	S	S	M	L	L
CO3	M	M	S	M	S	S	S	L	S	M
CO4	M	M	S	S	S	S	M	S	M	S
CO5	S	L	S	M	M	S	S	M	S	M

*S-Strong; M-Medium; L-Low



Sixth Semester

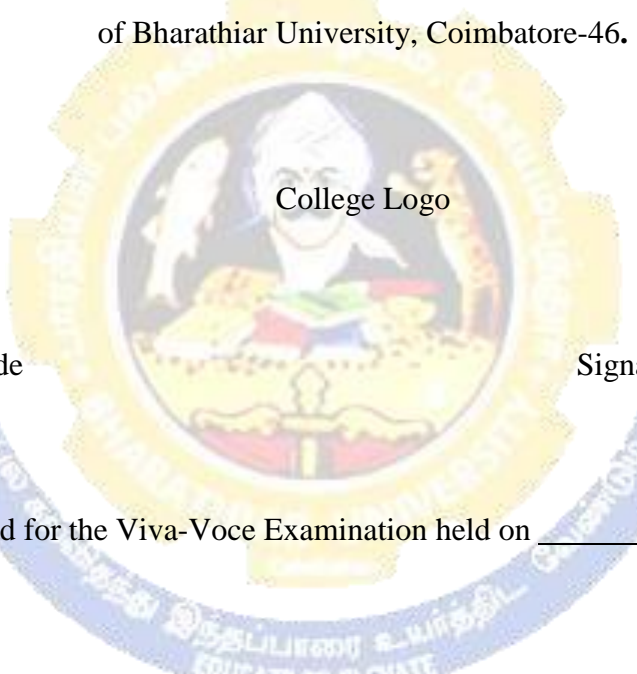
Course code		Graphics & Multimedia	L	T	P	C
Core/Elective/Supportive		Core : 10	5	0	0	4
Pre-requisite		Basic knowledge in 2D, 3D and multimedia file formats	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to: 1. Design and apply two dimensional graphics 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 Output Primitives: 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		
2		
3		
Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	S	S	M
CO2	S	S	S	M	S	M	M	M	S	M
CO3	S	M	M	M	S	M	M	M	S	M
CO4	S	S	S	M	S	M	M	M	S	M
CO5	S	S	S	M	S	M	S	S	S	M

*S-Strong; M-Medium; L-Low

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 any one 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 design solution for a set of requirements.					K3
2	Test and validate the conformance of the developed prototype against the original requirements of the problem.					K5
3	Work as a responsible member and possibly a leader of a team in developing software 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 the department staff concerned.						
Viva Voce						
1. Viva-Voce will be conducted at the end of the year by both Internal (Respective Guides) and External Examiners, after duly verifying the Annexure Report available in the College, for a 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	
<p>PROJECT WORK</p> <p>TITLE OF THE DISSERTATION</p> <p>Bonafide Work Done by</p> <p>STUDENT NAME</p> <p>REG. NO.</p> <p>Dissertation submitted in partial fulfillment of the requirements for the award of</p> <p><Name of the Degree></p> <p>of Bharathiar University, Coimbatore-46.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>College Logo</p> </div> </div> <div style="display: flex; justify-content: space-between;"> <p>Signature of the Guide</p> <p>Signature of the HOD</p> </div> <p>Submitted for the Viva-Voce Examination held on _____</p> <div style="display: flex; justify-content: space-between;"> <p>Internal Examiner</p> <p>External Examiner</p> </div> <p style="text-align: center;">Month – Year</p>	
<p>CONTENTS</p> <p>Acknowledgement</p> <p>Contents</p> <p>Synopsis</p> <p>1. Introduction</p> <p style="padding-left: 20px;">1.1 Organization Profile</p> <p style="padding-left: 20px;">1.2 System Specification</p> <p style="padding-left: 40px;">1.2.1 Hardware Configuration</p> <p style="padding-left: 40px;">1.2.2 Software Specification</p> <p>2. System Study</p> <p style="padding-left: 20px;">2.1 Existing System</p>	

<div style="margin-left: 40px;">2.1.1 Drawbacks</div> <div style="margin-left: 20px;">2.2 Proposed System</div> <div style="margin-left: 40px;">2.2.1 Features</div> <div style="margin-left: 20px;">3. System Design and Development</div> <div style="margin-left: 40px;">3.1 File Design</div> <div style="margin-left: 40px;">3.2 Input Design</div> <div style="margin-left: 40px;">3.3 Output Design</div> <div style="margin-left: 40px;">3.4 Database Design</div> <div style="margin-left: 40px;">3.5 System Development</div> <div style="margin-left: 60px;">3.5.1 Description of Modules (Detailed explanation about the project work)</div> <div style="margin-left: 20px;">4. Testing and Implementation</div> <div style="margin-left: 20px;">5. Conclusion</div> <div style="margin-left: 20px;">Bibliography</div> <div style="margin-left: 20px;">Appendices</div> <div style="margin-left: 40px;">A. Data Flow Diagram</div> <div style="margin-left: 40px;">B. Table Structure</div> <div style="margin-left: 40px;">C. Sample Coding</div> <div style="margin-left: 40px;">D. Sample Input</div> <div style="margin-left: 40px;">E. Sample Output</div>
Course Designed By: _____

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1										
CO2										
CO3										
CO4										
CO5										

*S-Strong; M-Medium; L-Low

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 to transform 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 of computer 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 of objects 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 draw 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	
Reference Books	
1	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	
2	
3	
Course Designed By:	

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	S	M	L	L	M	L
CO3	S	S	S	M	M	M	M	M	M	L
CO3	S	S	S	M	S	M	M	M	M	L
CO4	S	S	S	S	S	M	M	M	M	M
CO5	S	S	S	S	S	M	S	S	S	M

*S-Strong; M-Medium; L-Low



Course code		NETWORK SECURITY & ADMINISTRATION	L	T	P	C
Core/Elective/Supportive		Elective : II	5	0	0	4
Pre-requisite		Basics of Computer networks	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to:						
1. To enable the students to learn attacks on computers and how to handle the security issues.						
2. To study about the digital certificate and public key infrastructure protocols.						
3. To gain knowledge in firewalls in network securities.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of attacks on computers and computer security and cryptography encryption and decryption.					K2
2	Understand cryptography algorithm types and modes: asymmetric and symmetric key algorithms.					K2-K3
3	Understand the concept of digital certificate and public key infrastructure and internet security protocols.					K3
4	Understand the user authentication and keberos, cryptography in java, .NET and operating system.					K4
5	Knowledge in firewalls in network security, VPN and case studies in cryptography and security.					K3-K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1		ATTACKS ON COMPUTERS AND COMPUTER SECURITY	15 hours			
Attacks on computers and computer security: Introduction –Need for security – Security approaches - principles of security –Types of attacks. Cryptography : Concepts and techniques - - introduction – plain text and cipher text –substitution techniques – transposition techniques – encryption and decryption – symmetric and asymmetric key cryptography – steganograpy – key range and key size – possible types of attacks						
Unit:2		SYMMETRIC KEY ALGORITHMS AND AES	12 hours			
Symmetric Key Algorithms and AES : Introduction - Algorithm Types and modes – An overview of symmetric key cryptography – Data encryption Standard (DES) – International Data Encryption Algorithm (IDEA) – RC4 – RC5 – Blowfish – Advanced Encryption Standard (AES) . Asymmetric Key Algorithms: Digital Signature and RSA:. Introduction – brief history of Asymmetric Key cryptography – An Overview of Asymmetric Cryptography - The RSA algorithm – Symmetric and asymmetric cryptography together – digital signatures – Knapsack algorithm – Some other algorithms.						
Unit:3		DIGITAL CERTIFICATE AND PUBLIC KEY INFRASTRUCTURE (PKI)	15 hours			
Digital certificate and Public Key Infrastructure (PKI): Introduction – digital certificates – private key management- the PKIX model – Public key cryptography standards – XML, PKI and Security – Creating digital certificates using JAVA. Internet Security Protocols : Introduction – basic concepts –						

Secure Socket Layer – (SSL) – Transport Layer Security(TLS) – Secure Hyper Text Transfer Protocol (SHTTP) – Time Stamping Protocol (TSP) – Secure Electronic Transaction (SET) – SSL Versus SET – 3-D secure Protocol –Electronic Money - - Email security – Wireless Application Protocol (WIP) Security - Security in GSM –Security in 3G.										
Unit:4	USER AUTHENTICATION AND KERBEROS								15 hours	
User Authentication and Kerberos: Introduction – Authentication basics - Passwords – Authentication Tokens – Certificate based Authentication – biometric authentication – kerberos – Key distribution centre – Security handshake Pitfalls – Single sign on (SSO) Approaches. Cryptography in JAVA, .NET, and Operating System: Introduction – Cryptographic Solution using JAVA – Cryptographic Solutions using Microsoft .NET Framework – Cryptographic Toolkits – Security and Operating Systems – Database Security.										
Unit:5	NETWORK SECURITY FIREWALLS AND VIRTUAL PRIVATE NETWORKS (VPN)								15 hours	
Network Security Firewalls and Virtual Private Networks (VPN) : Introduction – Brief introduction to TCP/IP – Fire walls – IP security – Virtual Private networks (VPN) – Intrusion. Case Studies on Cryptography and Security : Introduction – Cryptographic Solutions a Case Study – SSO – Secure inter branch payment Transactions – DOS Attacks – IP Spoofing Attacks – Cross Site Scripting Vulnerability (CSSV) – Contract signing – secret Splitting - virtual elections – secure multiparty calculations – creating a VPN – Cookies and Privacy.										
Unit:6	Contemporary Issues								3 hours	
Expert lectures, online seminars – webinars										
	Total Lecture hours								75 hours	
Text Book(s)										
1	Atul Kahate, Cryptograpy and Network Security, Second Edition, Tata McGraw-Hill Publishing, 2003									
Reference Books										
1	Computer Networks, Andrew S. Tanenbaum, 4th edition, PHI.									
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]										
1										
2										
3										
Course Designed By:										
Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	M	M	S	S
CO2	S	M	S	M	S	L	S	M	M	M
CO3	S	S	S	M	S	M	M	M	S	M
CO4	S	M	S	M	S	M	M	L	S	S
CO5	S	S	S	M	S	S	S	S	S	M

*S-Strong; M-Medium; L-Low

Course code		Mobile Computing	L	T	P	C
Core/Elective/Supportive		Elective : II	5	0	0	4
Pre-requisite		Basic knowledge on mobile technologies	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to:						
1. To enable the students to study on the emerging technologies in mobile computing.						
2. To learn the basics of mobile computing and IVR application						
3. To make the students to learn about the architecture of mobile computing						
4. To understand the mobile technologies GPRS,CDMA and 3G						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the history of mobile computing, applications, standards and mobile computing architecture.					K1-K2
2	Understand the mobile computing techniques related to telephone, access procedures, IVR applications and Voice XML.					K2
3	Understand and analyse the emerging technologies Bluetooth, RFID, WiMAX, etc. also GSM.					K1-K3
4	Knowledge on GPRS, GPRS network architecture, Data services, applications for GPRS and limitations.					K4
5	Knowledge on CDMA and 3G, CDMA Vs GSM, applications of 3G wireless LAN, Architecture, Adhoc and sensor networks and security features.					K1-K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1	INTRODUCTION				10 hours	
Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services- Developing Mobile computer Applications – security in mobile computing – Standards _ Why is it necessary – Standard bodies. MOBILE COMPUTING ARCHITECTURE: History of computers and Internet – Architecture for mobile computing – Three-tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting applications mobile enabled						
Unit:2	MOBILE COMPUTING THROUGH TELEPHONY				10 hours	
UNIT II: MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application –Voice XML – TAPI						
Unit:3	EMERGING TECHNOLOGIES				10 hours	
EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card. GSM : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security. SMS						
Unit:4	GPRS				12 hours	
GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations						

– Data services in GPRS – Application for GPRS- Limitations – Billing and Charging. WAP : MMS – GPRS Applications		
Unit:5	CDMA and 3G	12 hours
CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G.		
	Total Lecture hours	55 hours
Text Book(s)		
1	MOBILE COMPUTING, Asoke K Talukder , Roopa R Yavagal, TMH, 2005	
Reference Books		
1	Jochen H. Schller, “Mobile Communications”, Second Edition, Pearson Education, New Delhi, 2007.	
2	Dharma Prakash Agarval, Qing and An Zeng, “Introduction to Wireless and Mobile systems”, Thomson Asia Pvt Ltd, 2005.	
3	Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, 2003.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1		
2		
3		
Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	S	M	L	M	S	S
CO2	S	S	S	L	S	M	L	M	S	M
CO3	S	S	S	L	S	L	L	M	M	M
CO4	S	S	S	L	S	L	L	M	M	M
CO5	S	S	S	L	S	M	L	M	S	M

*S-Strong; M-Medium; L-Low

Course code		PYTHON Programming	L	T	P	C
Core/Elective/Supportive		Elective : II	5	0	0	4
Pre-requisite	Knowledge on logic of the programs and oops concept.		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 python with 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 - list parameters. 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 Python Language, 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, First Edition.	
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 for Python 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		
2		
3		
Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	S	M	L	M	S	S
CO2	S	S	S	L	S	M	L	M	S	S
CO3	S	S	S	L	S	M	L	M	S	S
CO4	S	S	S	L	S	M	L	M	S	S
CO5	S	S	S	L	S	M	L	M	S	S

*S-Strong; M-Medium; L-Low

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 of logical 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 and life style.						
Unit:2						
		IOT and M2M	12 hours			
IoT and M2M - Deference between Iot and M2M - SDN and NFV for lot - 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 application frame 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 Madisetti Publisher: Universities press.	
Reference Books		
1	Internet of Things - Srinivasa K.G., Siddesh G.M. Hanumantha Raju R. Publisher: Cengage Learning India pvt. Ltd (2018)	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
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Course Designed By:		

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	S	M	S	L	L	M	S	S
CO2	S	S	S	M	S	M	M	L	S	M
CO3	S	S	S	L	M	L	M	M	S	S
CO4	M	M	S	M	S	M	L	L	S	S
CO5	S	S	S	L	S	L	M	M	S	M

*S-Strong; M-Medium; L-Low

Course code		COMPONENT TECHNOLOGY	L	T	P	C
Core/Elective/Supportive		Elective : III	5	0	0	4
Pre-requisite		Basics of information system and distributed system	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to: 1. To enable the students to learn the concepts of component technologies. 2. To learn the CORBA architecture and services, CCRBA and CORBA migration process.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of information system, overview of CORBA.					K2
2	Understand the language mapping, OLE integration, CCRBA services, information, task, system management and infrastructure services.					K3
3	Knowledge on facilities and domains, OMG process and relationship with other technologies.					K3
4	Understand the CORBA migration process, software architecture and application design using software architect II.					K4
5	Knowledge on problem and objective standard based profile, business objects and process and interface migration.					K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create						
Unit:1		Introduction			15 hours	
Information system - Analyzing the Scenario challenges - CORBA overview - Concepts - Overview of CORBA IDL - IDL Tutorial Conversion of OO design to IDL - IDL Guidelines - Overview of CORBA and Standard Object model - Architecture - Clients & Object Implementation interface and implementation.						
Unit:2		Management Services			15 hours	
Language mapping - Portability and interoperability - OLE integration - CCRBA services - Information Management Services - Task Management- System Management - Infrastructure of Services.						
Unit:3		Facilities, Domains and Relationship with other Technologies			15 hours	
Facilities and domains - horizontal - Vertical facilities - Leveraging the OMG Process - Relationship with other technologies.						
Unit:4		Software Architecture			15 hours	
The CORBA migration process - software Architecture - Applications Design using software Architect ii						
Unit:5		Migration Case Studies			12 hours	

Migration case studies - Problem and Objective standard based Profile - Project context - Business objects and Process - Interface migration.		
Unit:6	Contemporary Issues	3 hours
Expert lectures, online seminars – webinars		
	Total Lecture hours	75 hours
Text Book(s)		
1	Inside CORBA — Distributed Object Standards and Applications Thomas J. owtray, William A. Roh. Addison Wesley 1999.	
2		
Reference Books		
1		
2		
3		
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1		
Course Designed By:		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	S	M	S	S	S	M	M
CO2	S	S	S	M	M	M	S	M	S	S
CO3	S	S	S	M	M	M	M	M	S	S
CO4	S	S	S	M	M	M	M	M	S	S
CO5	S	S	S	M	M	M	M	M	S	S

*S-Strong; M-Medium; L-Low

Course code		E Commerce	L	T	P	C
Core/Elective/Supportive		Elective : III	5	0	0	4
Pre-requisite		Basic understanding in use of internet in commercial applications	Syllabus Version	2020-21 Onwards		
Course Objectives:						
The main objectives of this course are to: 1. To enable the students to learn and understand the E-Commerce strategies. 2. To understand the E-Market and EDI standards and implementations. 3. To study and understand the online payments in E-Commerce applications and other E-Commerce applications used in the internet.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understanding the basics of E-Commerce and its strategies.					K1, K2
2	Knowledge in basics of business strategy, E-Commerce implementation, the credit transaction trade cycle.					K2
3	Understand the E-markets, EDI standards, communication and implementations.					K3
4	Understand the internet, HTML, server side scripting and client side scripting languages, online payments in E-Commerce applications.					K4
5	Knowledge in the internet bookshops, electronic newspapers, virtual auctions gambling on the Net and e-diversity.					K4
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Unit:1	Introduction to E-Commerce				10 hours	
The Scope of E-Commerce – Definition-E-Commerce & the Trade Cycle – Electronic Market – Electronic Data Interchange – The Internet Commerce – The E-Commerce in Perspective. Business Strategy: The Value Chain – Supply Chains – Porter’s Value Chain Model – The Inter Organizational Value Chain						
Unit:2	The Introduction to Business Strategy				10 hours	
The Introduction to Business Strategy – Strategic Implications of IT – Technology – Business Environment – Business Capability – Existing Business Strategy – Strategy Formulation & Implementation Planning – e-Commerce Implementation -Commerce Evaluation. The Inter Organizational Transactions – The Credit Transaction Trade Cycle. A Variety of Transactions – Pens & Things.						
Unit:3	E-Markets				10 hours	
Markets – E-Markets-Usage of E-Markets-Advantages & Disadvantages of E-Markets. EDI: Introduction – Definition - Benefits of EDI – EDI Standards – EDI Communication EDI Implementation – EDI Agreement – EDI Security						
Unit:4	The Internet				12 hours	
The Internet – The Development of the Internet – TCP/IP – Internet Components – Uses of the Internet – A Page on the Web: HTML Basics – Introduction to HTML – Further HTML – Client Side Scripting – Server Side Scripting – HTML Editors & Editing – The Elements of E-Commerce						

: Elements – e-Visibility – The e-Shop – On line Payments - Delivering the Goods – Internet e-Commerce Security .		
Unit:5	E-Business: Introduction	12 hours
- The Internet Bookshops – Grocery Supplies - Software Supplies and Support – Electronic Newspapers – The Internet Banking - The Virtual Auctions – Online Share Dealing – Gambling on the Net – e-Diversity.		
Unit:6	Contemporary Issues	3 hours
Expert lectures, online seminars - webinars		
	Total Lecture hours	55 hours
Text Book(s)		
1	David Whiteley, E-Commerce – Strategy, Technology & Applications, Tata McGrawHill.	
2		
Reference Book(s)		
1	E-Commerce - An Indian Perspective, P.T.Joseph, S.J., Fourth Edition, PHI 2012.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1		
2		
3		
Course Designed By:		

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	M	L	S	M	M	L
CO3	S	S	S	L	M	M	S	M	S	L
CO3	S	S	S	M	S	M	S	S	S	M
CO4	S	S	S	M	S	M	S	S	M	M
CO5	S	M	M	M	M	S	S	S	S	M

*S-Strong; M-Medium; L-Low

Course code		Lab – DOT NET LAB	L	T	P	C
Core/Elective/Supportive		Skill based Subject Lab : 4	0	0	4	3
Pre-requisite		Students should have strong knowledge in Dot NET.	Syllabus Version		2020-21 Onwards	
Course Objectives:						
The main objectives of this course are to: 1. To understand .NET framework to develop web centric applications. 2. To enable students to learn the basics of I/O and object oriented programming. 3. To familiar with VB.NET and ASP.NET IDE 4. To learn about the ASP.NET controls and ADO.NET. 5. To enable the students to learn how to build and deployment of web services.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basics of VB.NET and develop windows applications.			K2, K4, K6		
2	Understand the concept of tree view control and illustrate it the using VB.NET.			K2, K4, K6		
3	Understand and apply exception handling in VB.NET.			K2, K4, K6		
4	Understand menu resource and create application using menus.			K2, K4, K6		
5	Develop database applications in VB.NET.			K2, K4, K6		
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create						
Programs				36 hours		
1. Create a VB .Net program to add a string to Combo box with value of Textbox when user clicks button control.						
2. Create a VB .Net program to display hierarchical representations of items with tree view control using Runtime coding.						
3. Create a VB .Net program to handle user defined Exceptions.						
4. Create a VB .Net program for Employee details to read and display the data using constructors and member functions.						
5. Create an application in VB .Net to demonstrate the following events: i. Click ii. Mouse Down iii. Key Down iv. Form Load						
6. Create an application in VB .Net for File Menu with Menu items New, Open, Save, Print and Exit & Edit Menu with Menu items Cut, Copy, Paste, Find and Undo.						
7. Create an application in VB .Net for student information database and perform the following operations: i. Addition ii. Deletion iii. Updation						
8. Design a website using web form to show the current date and time when a user clicks the button.						
			Total Lecture hours		36 hours	

Text Book(s)	
1	Bill Evjen, Jason Beres, et.al, Visual Basic .Net programming, Wiley Dreamtech India (p) Ltd. ISBN 81-265-0254-1.
Reference Books	
1	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	Fergal Grimes, Microsoft .NET for programmers, Shroff Publishers & Distributors (P) Ltd. ISBN 81-7366-540-0.
2	Thuan Thai & Hoang Q.Lam, .NET Framework Essentials, Shroff Publishers & Distributors (P) Ltd. ISBN 81-7366-654-7
Course Designed By:	

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	M	M	M	M	M	L
CO2	S	S	S	S	M	S	S	M	L	L
CO3	S	S	S	S	S	S	S	L	S	M
CO4	S	S	S	S	S	S	M	S	M	S
CO5	S	S	S	M	M	S	S	M	S	M

*S-Strong; M-Medium; L-Low

Annexure

B. Sc. Information Technology

Syllabus

(With effect from 2020 -2021)

Program Code : 26J



DEPARTMENT OF INFORMATION TECHNOLOGY

Bharathiar University

**(A State University, Accredited with “A” Grade by NAAC and
13th Rank among Indian Universities by MHRD-NIRF)**

Coimbatore 641 046, INDIA

BHARATHIAR UNIVERSITY : : COIMBATORE 641046
DEPARTMENT OF Information Technology

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 and interdisciplinary fields.
- ✓ Promote inter-disciplinary research among the faculty and the students to create state of art research facilities.
- ✓ To promote quality and ethics among the students.
- ✓ Motivate the students to acquire entrepreneurial skills to become global leaders.

