CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK
BCA
(Those who have joined in the Academic year 2023-24 onwards)

PROGRAM OUTCOMES (PO)

PO 1	Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems
PO 2	Ability to demonstrate knowledge of Computer science and its applications in order to enhance basic understanding of various software technologies.
PO 3	Learn to design innovative solutions for solving real life business problems and addressing business development issues with a passion for quality competency and holistic approach.
PO 4	Ability to adapt new technologies for upgrading their skills and contributing to a lifelong learning.
PO 5	Ability to become employable in a variety of IT companies and government sector and also seek entrepreneurship opportunities for the development of an individual and society at large.

PROGRAM SPECIFIC OUTCOME (PSO)

PSO 1	To engage in professional development and to pursue post graduate education in the fields of information technology and Computer Applications.
PSO 2	Analyze and synthesis computing systems through quantitative and qualitative techniques.
PSO 3	Competence to use research, experiment, contemporary issues to solve industrial problems.
PSO 4	Expertise to face the challenges of changing trends and career opportunities as per local and global industry needs.

PO AND PEO MAPPING

	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6	PEO7
PO1	S	M	S	S	M	M	S
PO2	S	M	M	S	M	M	S
PO3	M	S	S	M	S	S	S
PO4	S	S	M	S	S	S	M
PO5	M	M	M	L	S	M	M

CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK

COMPUTER APPLICATIONS

Part	Courses	Subject	Code	Cr.	Hrs
SEMESTER I					
I	Lang. – I	nghJj;jkpo; - I	230103101	3	6
II	Lang. - II	General English	231003101	3	4
III	CC – 1	Object Oriented Programming Concepts Using C++	232703101	4	5
	CC – 2	Practical : C++ Programming	232703102	4	5
	EC – I [Any One]	Multimedia Systems	232703103	3	4
		Biometrics	232703104		
		E-Commerce	232703105		
IV	SEC –I(NME)	Introduction to Computers	234603127	2	2
IV	FC	Structured Programming Language in C	234403127	2	2
	AECC- Soft Skill – 1	Soft Skill - I	236003101	2	2
	Total			**23**	**30**
SEMESTER II					
I	Lang. -I	nghJj;jkpo; - II	230103201	3	6
II	Lang. -II	General English	231003201	3	4
III	CC – 3	Python Programming	232703201	4	5
	CC - 4	Practical : Python Programming	232703202	4	5
	EC – II [Any One]	Information Security	232703203	3	4
		Cyber Forensics	232703204		
		Human Computer Interaction	232703205		
. IV	SEC –II(NME)	Introduction to internet	234603227	2	2
	SEC - III	Practical : Web Designing	234403227	2	2
	AECC –II Soft Skill -2	Soft Skill - II	236003201	2	2
				23	**30**
SEMESTER III					
I	Lang. -I	nghJj;jkpo; - III	230103301	3	6
II	Lang. -II	General English	231003301	3	4
III	CC – 5	Data Structures and Algorithms	232703301	4	5
	CC - 6	Practical : Data Structures and Algorithms	232703302	4	4
	EC –3	Allied: Mathematics – I	232703303	3	4
		Statistical Methods and its Application-I	232703304		
IV	SEC –IV	PHP Programming	234403327	1	2
	SEC – V	Practical: PHP Programming	238203327	2	2
	AECC – III Soft skill – 3	Soft Skill - 3	236003301	2	2
	EVS	Environmental Studies	234103301	1	1
				23	**30**

Part	Courses		Code	Cr.	Hrs
SEMESTER IV					
I	Lang. – I	nghJj;jkpo; - IV	230103101	3	6
II	Lang. - II	General English	231003101	3	4
III	CC – 7	.Net Programming	232703401	4	5
	CC - 8	Practical: .Net Programming	232703402	4	4
	EC – IV	Allied Mathematics : II	232703403	3	4
		Statistical Methods and its Application-II	232703404		
IV	SEC –VII	Software Engineering	234403427	2	2
IV	SEC –VIII	Practical : Linux Programming	238203427	2	2
	AECC	Soft Skill - IV	236003401	2	2
	EVS	Environmental Studies	234103401	1	1
	Total			**24**	**30**
SEMESTER V					
III	CC – 9	Operating System	232703501	4	5
	CC - 10	Java Programming	232703502	4	5
	CC - 11	Database Management System	232703503	4	5
	Core 12	Practical : Java Programming	232703504	4	4
	EC – V	Introduction to Data Science	232703505	3	5
		Artificial Neural Network	232703506		
	EC – VI	Cloud Computing	232703507	3	5
		Agile Project Management	232703508		
IV		Value Education	234303501	1	1
		Internship/Industrial Training(carried out in II year summer vacation)30 hrs	232703509	2	-
				25	**30**
SEMESTER VI					
III	CC – 13	R Programming	232703601	4	5
	CC – 14	Mini Project	232703602	4	5
	CC – 15	Practical: R programming	232703603	4	5
	EC –7	Data Mining and Warehousing	232703604	3	5
		Network Security	232703605		
	EC - 8	Computational Intelligence	232703606	3	5
		Mobile Adhoc Network	232703607		
IV	Processional competency skill enhancement course	Data Communication and Computer Networks	232703608	2	4
		Value Education	234303601	1	1
V		Extension Activity (outside college hrs)		1	-
				22	**30**

Title of the Course		**OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++**					
PART		**III**					
Category	Core - I	**Year**	I	**Credits**	4	**Course Code**	**232703101**
		Semester	I				

Instructional Hours per week	**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
	5	-	--	5	25	75	100

Learning Objectives

- Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
- Understand dynamic memory management techniques using pointers, constructors, destructors, etc
- Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
- Demonstrate the use of various OOPs concepts with the help of programs

UNIT	**Details**	**No. of Periods for the Unit**
I	Introduction to C++ - 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.	**15**
II	Classes and Objects: 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.	**15**
III	Operator Overloading: 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.	**15**
IV	Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes andBase classes – Arrays – Characteristics – array of classes – Memory models – new and deleteoperators – dynamic object – Binding, Polymorphism and Virtual Functions.	**15**
V	Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCIIFiles – Random Access Operation – Templates – Exception Handling – String – Declaring andInitializing string objects – String Attributes – Miscellaneous functions .	**15**

Course Outcomes

Course Outcomes	On completion of this course, students will be able;
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
CO3	Apply the programming principles learnt in real-time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases

Text Books (Latest Editions)	
1	E. Balagurusamy, "Object-Oriented Programming with C++", TMH 2013, 7th Edition.
Reference Books	
1.	Ashok N Kamthane, "Object-Oriented Programming with ANSI and Turbo C++", Pearson Education 2003.
2.	Maria Litvin& Gray Litvin, "C++ for you", Vikas publication 2002.
3.	Object-Oriented Programming Using C++ by Alok Kumar Jagadev , Amiya Kumar Rath , Satchidananda Dehuri , PHI Learning, 2017

Web Resources	
1.	https://alison.com/course/introduction-to-c-plus-plus-programming
2	https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/
3	https://www.w3schools.com/cpp/cpp_oop.asp

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	M					S		
CO 2		M						
CO 3		S		L				
CO 4						S		M
CO 5							M	

S-Strong M-Medium L-Low

Mapping with Programme Specific Outcomes:

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	3	2
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	3	3	3	3	2
CO5	3	3	2	3	3
Weightage	15	15	13	13	13
Weighted percentage of Course Contribution to Pos	69/75=92%				

Title of the Course		**PRACTICAL : C++ PROGRAMMING**						
PART		**III**						
Category	Core - II	**Year**	I	**Credits**	4	**Course Code**	**232703102**	
		Semester	I					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		-	-	5	5	25	75	100

Learning Objectives

- Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
- Understand dynamic memory management techniques using pointers, constructors, destructors, etc
- Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
- Demonstrate the use of various OOPs concepts with the help of programs

UNIT	Details	No. of Periods for the Unit
1	Write a C++ program to demonstrate function overloading, Default Arguments and Inlinefunction.	
2	Write a C++ program to demonstrate Class and Objects	
3	Write a C++ program to demonstrate the concept of Passing Objects to Functions	
4	Write a C++ program to demonstrate the Friend Functions.	
5	Write a C++ program to demonstrate the concept of Passing Objects to Functions	
6	Write a C++ program to demonstrate Constructor and Destructor	
7	Write a C++ program to demonstrate Unary Operator Overloading	
8	Write a C++ program to demonstrate Binary Operator Overloading	
9	Write a C++ program to demonstrate: ● Single Inheritance ● Multilevel Inheritance ● Multiple Inheritance ● Hierarchical Inheritance ● Hybrid Inheritance	
10	Write a C++ program to demonstrate Virtual Functions.	
11	Write a C++ program to manipulate a Text File.	
12	Write a C++ program to perform Sequential I/O Operations on a file.	
13	Write a C++ program to find the Biggest Number using Command Line Arguments	
14	Write a C++ program to demonstrate Class Template	
15	Write a C++ program to demonstrate Function Template.	
16	Write a C++ program to demonstrate Exception Handling.	

Course Outcomes	
Course Outcomes	Upon completion of the course the students would be able to:
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
CO3	Apply the programming principles learnt in real-time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases

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3.	Object-Oriented Programming Using C++ by Alok Kumar Jagadev , Amiya Kumar Rath , Satchidananda Dehuri , PHI Learning, 2017

Web Resources	
1.	https://alison.com/course/introduction-to-c-plus-plus-programming
2	https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/
3	https://www.w3schools.com/cpp/cpp_oop.asp

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	M					S		
CO 2		M						
CO 3		S		L				
CO 4						S		M
CO 5							M	

S-Strong M-Medium L-Low

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

CO /PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	3	2
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	3	3	3	3	2
CO5	3	3	2	3	3
Weightage	15	15	13	13	13
Weighted percentage of Course Contribution to PSO	69/75=92%				

Title of the Course		**Multimedia Systems**						
PART		**III**						
Category	Elective - I	**Year**	I	**Credits**	3	**Course Code**	**232703103**	
		Semester	I					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		4	-	--	4	25	75	100

Learning Objectives

- Understand the definition of Multimedia
- To study about the Image File Formats, Sounds Audio File Formats
- Understand the concepts of Animation and Digital Video Containers
- To study about the Stage of Multimedia Project
- Understand the concept of Ownership of Content Created for Project Acquiring Talent

UNIT	**Details**	**No. of Periods for the Unit**
I	Multimedia Definition-Use Of Multimedia-Delivering Multimedia-Text: About Fonts and Faces - Using Text in Multimedia -Computers and Text Font Editing and Design Tools- Hypermedia andHypertext.	**12**
II	Images: Plan Approach - Organize Tools - Configure Computer Workspace -Making Still Images - Color - Image File Formats. Sound: The Power of Sound -DigitalAudio-MidiAudio-Midivs.DigitalAudio-MultimediaSystemSounds Audio File Formats -Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project	**12**
III	Animation: The Power of Motion-Principles of Animation-Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays-Digital Video Containers-Obtaining Video Clips -Shooting and Editing Video	**12**
IV	Making Multimedia: The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs - The Software Needs - An Authoring Systems Needs-Multimedia Production Team.	**12**
V	PlanningandCosting:TheProcessofMakingMultimedia-Scheduling-Estimating - RFPs and Bid Proposals. Designing and Producing - Content and Talent:Acquiring Content Ownership of Content Created for Project-AcquiringTalent	**12**

Course Outcomes

Course Outcomes	**Course Outcomes**
	On completion of this course, students will
CO1	understand the concepts, importance, application and the process of developing multimedia
CO2	to have basic knowledge and understanding about image related processings
CO3	To understand the framework of frames and bit images to animations
CO4	Speaks about the multimedia projects and stages of requirement in phases of project.
CO5	Understanding the concept of cost involved in multimedia planning, designing, and producing

Text Books (Latest Editions)

1	TayVaughan,"Multimedia:MakingItWork",8thEdition,Osborne/McGraw-Hill,2001.
Reference Books	
1.	RalfSteinmetz&KlaraNahrstedt"MultimediaComputing,Communication&Applications",PearsonEducation,2012.
2.	Introduction to Multimedia Systems (Communications, Networking and Multimedia) 1st Edition by Sugata Mitra , Gaurav Bhatnagar
3.	Handbook of Internet and Multimedia Systems and Applications: 6 (Internet and Communications) Hardcover – Import, 29 December 1998, by Borko Furht
Web Resources	
1.	https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/
2	https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
3	https://mu.ac.in/wp-content/uploads/2021/04/Multimedia.pdf

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	2	2	1	1	3	2	2
CO 2	3	3	2	2	1	3	3	2
CO 3	3	3	3	2	1	3	3	3
CO 4	3	3	3	3	1	3	3	3
CO 5	3	3	3	3	3	3	3	3

S-Strong M-Medium L-Low

Mapping with programme specific outcomes:

CO /PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	2	2
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	3	3	3	3	2
CO5	3	3	2	3	3
Weightage	15	15	13	12	13
Weighted percentage of Course Contribution to PSO	68/75=90.6%				

Title of the Course		**Biometrics**						
PART		**III**						
Category	Elective - I	**Year**	I	**Credits**	3	**Course Code**	**232703104**	
		Semester	I					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		4	-	--	4	25	75	100

Learning Objectives

- Identify the various biometric technologies.
- Design of biometric recognition.
- Develop simple applications for privacy
- Understand the need of biometric in the society
- Understand the scope of biometric techniques

UNIT	Details	No. of Periods for the Unit
I	**Introduction**: What is Biometrics, History,Types of biometric Traits, General architecture of biometric systems, Basic working of biometric matching, Biometric system error and performance measures, Design of biometric system, Applications of biometrics, Biometrics versus traditional authentication methods. **Face Biometrics:** Introduction, Background of Face Recognition, Design of Face Recognition System, Neural Network for Face Recognition, Face Detection in Video Sequences, Challenges in Face Biometrics, .7 Face Recognition Methods, Advantages and Disadvantages.	**12**
II	**Retina and Iris Biometrics:** Introduction, Performance of Biometrics, Design of Retina Biometrics, Design of Iris Recognition System, Iris Segmentation Method , Determination of Iris Region, Determination of Iris Region, Applications of Iris Biometrics, Advantages and Disadvantages **Vein and Fingerprint Biometrics:** Introduction, Biometrics Using Vein Pattern of Palm, Fingerprint Biometrics, Fingerprint Recognition System, Minutiae Extraction, Fingerprint Indexing, Experimental Results, Advantages and Disadvantages.	**12**
III	**Privacy Enhancement Using Biometrics:** Introduction, Privacy Concerns Associated with Biometric Deployments, Identity and Privacy, Privacy Concerns, Biometrics with Privacy Enhancement, Comparison of Various Biometrics in Terms of Privacy, Soft Biometrics. **Multimodal Biometrics:** Introduction to Multimodal Biometrics , Basic Architecture of Multimodal Biometrics, Multimodal Biometrics Using Face and Ear, Characteristics and Advantages of Multimodal Biometrics, Characteristics and Advantages of Multimodal Biometrics.	**12**

IV	**WatermarkingTechniques:** Introduction, Data Hiding Methods, Basic Framework of Watermarking, Classification of Watermarking, Applications of Watermarking, Attacks on Watermarks, Performance Evaluation, Characteristics of Watermarks, General Watermarking Process, Image Watermarking Techniques, Watermarking Algorithm, Experimental Results, Effect of Attacks on Watermarking Techniques, Attacks on Spatial Domain Watermarking.	**12**
V	**Scope and Future:** Scope and Future Market of Biometrics, Biometric Technologies, Applications of Biometrics, Biometrics and Information Technology Infrastructure, Role of Biometrics in Enterprise Security, Role of Biometrics in Border Security, Smart Card Technology and Biometrics, Radio Frequency Identification (RFID) Biometrics, DNA Biometrics, Comparative Study of Various Biometric Techniques. **Biometric Standards:** Introduction, Standard Development Organizations, Application Programming Interface (API), Information Security and Biometric Standards, Biometric Template Interoperability.	**12**

Course Outcomes

Course Outcomes	Course Outcomes
	On completion of this course, students will
CO1	To understand the basic concepts and the functionality of the Biometrics, Face Biometrics, Types, Architecture and Applications.
CO2	To know the concepts Retina and Iris Biometrics and Vein and Fingerprint Biometrics.
CO3	To analyse the Privacy Enhancement and Multimodal Biometrics.
CO4	To get analyticalidea on Watrmarking Techniques
CO5	To Gain knowledge on Future scope of Biometrics,and Study of various Biometric Techniques.

Text Books (Latest Editions)

1	Biometrics: Concepts and Applications by G.R Sinha and SandeepB.Patil , Wiley, 2013

Reference Books

1.	Guide to Biometrics by Ruud M. Bolle , SharathPankanti, Nalinik.Ratha, Andrew W.Senior, Jonathan H. Connell , Springer 2009
2.	Introduction to Biometrics by Anil k. Jain, Arun A. Ross, KarthikNandakumar
3.	Hand book of Biometrics by Anil K. Jain, Patrick Flynn, ArunA.Ross.

Web Resources	
1.	https://www.tutorialspoint.com/biometrics/index.htm
2	https://www.javatpoint.com/biometrics-tutorial
3	https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/inspired/biometrics

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	S		M			L		M
CO 2	S	M	L			M		
CO 3			S		M			
CO 4	S	M	M				L	
CO 5		M				L	M	

S-Strong M-Medium L-Low

Title of the Course		**E-Commerce**						
PART		**III**						
Category	Elective - I	**Year**	I	**Credits**	3	**Course Code**	**232703105**	
		Semester	I					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		4	-	--	4	25	75	100

Learning Objectives

- To Describe E-Commerce Framework.
- To understand use World Wide Web , e-commerce advertising and marketing
- To understand about E-Security and Ethical issues in E-Commerce
- Understand the need of Electronic system of payment.
- Understand the scope of Information Systems and portals for E-Business.

UNIT	**Details**	**No. of Periods for the Unit**
I	**History of E-commerce and Indian Business Context**: E-Commerce –Emergence of the Internet –Emergence of the WWW – Advantages of E-Commerce – Transition to E-Commerce in India – The Internet and India – E-transition Challenges for Indian Corporate. **Business Models for E-commerce:** Business Model – E-business Models Based on the Relationship of Transaction Parties -E-business Models Based on the Relationship of Transaction Types.	**12**
II	**Enabling Technologies of the World Wide Web:** World Wide Web – Internet Client-Server Applications–Networks and Internets– Software Agents–Internet Standards and Specifications–ISP. **e-Marketing:**TraditionalMarketing–IdentifyingWebPresenceGoals–OnlineMarketing–E-advertising–E-branding	**12**
III	**E-Security:**InformationsystemSecurity–SecurityontheInternet–E-businessRiskManagement Issues – Information Security Environment in India. **Legal and Ethical Issues :**Cybers talking – Privacy is at Risk in the Internet Age– Phishing –Application Fraud –Skimming–Copyright–Internet Gambling–Threats to Children	**12**

IV	**e-Payment Systems:** Main Concerns in Internet Banking – Digital Payment Requirements –Digital Token-based e-payment Systems – Classification of New Payment Systems – Propertiesof Electronic Cash – Cheque Payment Systems on the Internet – Risk and e-Payment Systems –Designing e-payment Systems – Digital Signature – Online Financial Services in India - OnlineStockTrading..	**12**
V	.**InformationsystemsforMobileCommerce:**WhatisMobileCommerce ?–WirelessApplications –Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce –Wireless Technologies – Different Generations in Wireless Communication – Security IssuesPertainingtoCellularTechnology. **PortalsforE-Business:**Portals–HumanResourceManagement– VariousHRISModules	**12**

Course Outcomes

Course Outcomes	Course Outcomes
	On completion of this course, students will
CO1	Understanding the basic electronic business management
CO2	Analyze the technologies and marketing trends in Ecommerce
CO3	Knowledge gain in E security, Legal and Ethical issues
CO4	A clear evaluation of the e payment systems
CO5	Improve the expertise in mobile commerce and apply knowledge in development of E-Business portals

Text Books (Latest Editions)

1	P.T.Joseph, S.J.,"E-Commerce-AnIndianPerspective", PHI 2012, 4thEdition.

Reference Books

1.	DavidWhiteley,"E-CommerceStrategy,Technologies and Applications",Tata McGrawHill,2001.
2.	RaviKalakota,AndrewBWhinston,"Frontiers of Electronic Commerce", Pearson 2006, 12th Impression.
3.	The complete E-commerce book design, build and maintain a successful web-based business, by Janice Reynolds, 2nd edition, CRC Press, Taylor & Francis Group,2017

Web Resources	
1.	https://www.tutorialspoint.com/e_commerce/index.htm
2	https://www.javatpoint.com/online-marketing
3	https://www.geeksforgeeks.org/e-commerce/

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	S		M			L		M
CO 2	S	M	L			M		
CO 3			S		M			
CO 4	S	M	M				L	
CO 5		M				L	M	

S-Strong M-Medium L-Low

Title of the Course		**INTRODUCTION TO COMPUTERS**						
PART		**IV**						
Category	SEC – I NME	**Year**	I	**Credits**	2	**Course Code**	**234603127**	
		Semester	I					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		2	-	--	2	25	75	100

Learning Objectives

✍ To inculcate the knowledge about the computer and its characteristics and its generation
✍ To disseminate the classification , Anatomy of digital computer and its architecture
✍ To reveal the knowledge about the CPU and Memory
✍ To illustrate about the secondary storage devices and its organization
✍ To demonstrate about the general software features and trends

UNIT	**Details**	**No. of Periods for the Unit**
I	Introduction to computers: Introduction - Importance of computers - Characteristics of Computers – Classification of Computers – Ability and disability of Computers – Five Generations of Modern Computers.	**6**
II	Classification of Digital Computer Systems: Anatomy of a Digital Computer: Introduction – Parts of a Computer Indepth Study – CPU – Memory – Input Devices. Computer Architecture: First Electronic Computers – Inside the Memory -Inside the Processor – Peripheral Devices.	**6**
III	Central Processing Unit & Memory:Control Unit – Arithmetic Logic Unit, Memory -Memory Organization – RAM – Types of RAM – ROM – Factors affecting Processor Speed.	**6**
IV	Secondary(Auxiliary) Storage devices : Classification of Secondary Storage devices – Magnetic Tapes – Quarter Inch Catridge (QIC) Tapes – 8 MM Helical Scan Tapes – DAT Cartridge - Magnetic Disks and Hard Disks – Removable Pack Disk Systems – Optical Disk – CD ROM	**6**
V	General Software Features and Trends: Introduction – Graphical User Interface – Open Source Software(OSS) – Distributed Computing – Service Oriented Architecture & Embedded Systems – Cloud Computing & Network Computing – Software As A Service(SAAS) and Mobile Computing.	**6**

Course Outcomes

Course Outcomes	On completion of this course, the students will be able
CO1	To lecture on definition of computer and its characteristics, classification and generation.
CO2	To demonstrate about Classification and Anatomy of digital computer and its architecture.
CO3	To lecture on CPU and Memory.
CO4	To summarize the organization of secondary storage devices and its functionalities.
CO5	To demonstrate about the General Software Features and Trends.

Text Books (Latest Editions)	
1	Alexis Leon and Mathews Leon , Fundamentals of Information Technology , 2nd Edition, L and L Consultancy Services Pvt Ltd., India.

UNIT	CHAPTER
I	1, 2
II	3,4,5
III	7
IV	8
V	15

Reference Books	
1.	V.Rajaraman, Fundamentals of computers, 4th edition, Prentice Hall of India, New Delhi, 1999.
2.	R.S.Salaria, A gate way to Computer Literacy, Computer Fundamentals, Khanna Publishing.
3.	Thareja Reema, Fundamentals of Computers, 2nd Edition, Oxford Higher Education, 2020
Web Resources	
1.	https://www.tutorialspoint.com
2.	https://www.w3schools.com
3.	https://www.codecademy.com
4.	https://www.geeksforgeeks.org
5.	**https://wikipedia.org**

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**
CO 1	3	3	3	3	1
CO 2	2	2	2	3	3
CO 3	3	1	2	2	3
CO 4	1	3	3	3	2
CO 5	2	3	1	2	3

S-Strong M-Medium L-Low

Mapping with programme specific outcomes:

CO/PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	3	3	3
CO2	2	2	1	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	2
CO5	2	3	3	2	3
Weightage	13	14	13	14	14
Weighted percentage of Course Contribution to PSOs	**68/75 =90.6%**				

Title of the Course		**STRUCTURED PROGRAMMING LANGUAGE IN C**					
PART		**IV**					
Category	FC	**Year**	I	**Credits**	2		**234403127**

		Semester	I			**Course Code**	

Instructional Hours per week	**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
	2	-	--	2	25	75	100

Learning Objectives

- To familiarize the students with the Programming basics and the fundamentals of C, Datatypes in C, Mathematical and logical operations.
- To understand the concept using if statements and loops
- This unit covers the concept of Arrays
- This unit covers the concept of Functions
- To understand the concept of implementing pointers.

UNIT	**Details**	**No. of Periods for the Unit**
I	**Overview of C**: Importance of C-Sample C program-C program structure-executing C program - Constants- Variables and Data Types: Character set - C tokens - keywords and identifiers – constants-variables- data types- declaration of variables-Assigning values to variables-Assignment statement- Declaring a variable as constant- as volatile - Operators and Expression.	**6**
II	**Decision Making and Branching**: Decision making with If- simple IF- IF ELSE- nested IF ELSE - ELSE IF ladder- Switch- GOTO statement. **Decision Making and Looping**: While- Do-While- For-Jumps in loops.	**6**
III	**Arrays**: Declaration and accessing of one & two-dimensional arrays-initializing two-dimensional arrays- multidimensional arrays.	**6**
IV	**Functions**: The form of C functions- Return values and types- calling a function- categories of functions- Nested functions- Recursion-functions with arrays- call by value- call by reference- storage classes-character arrays and string functions	**6**
V	**Pointers:** definition- declaring and initializing pointers- accessing a variable through address and through pointer- pointer expressions-pointer increments and scale factor- pointers and arrays- pointers and functions- pointers and structures.	**6**

Course Outcomes

Course Outcomes	On completion of this course, the students will be able
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
CO3	Apply the programming principles learnt in real-time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases

Text Books (Latest Editions)	
1	E. Balagurusamy, Programming in ANSI C, Fifth Edition, Tata McGraw-Hill, 2010.

Reference Books	
1.	Byron Gottfried, Schaum's Outline Programming with C, Fourth Edition, Tata McGraw-Hill, 2018.
2.	Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998
3.	YashavantKanetkar, Let Us C, Eighteenth Edition, BPB Publications,2021
Web Resources	
1.	https://codeforwin.org/
2.	https://www.geeksforgeeks.org/c-programming-language/
3.	http://en.cppreference.com/w/c
4.	http://learn-c.org/
5.	https://www.cprogramming.com/

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**
CO 1	3	3	3	3	1
CO 2	2	2	2	3	3
CO 3	3	1	2	2	3
CO 4	1	3	3	3	2
CO 5	2	3	1	2	3

S-Strong M-Medium L-Low

Mapping with Programme Specific Outcomes:

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	2	3	2	2
CO2	2	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	2
Weightage	14	14	14	14	13
Weighted percentage of Course Contribution to Pos	69/75=92%				

Title of the Course		**PYTHON PROGRAMMING**						
PART		**III**						
Category	Core	**Year**	I	**Credits**	4	**Course Code**	**232703201**	
		Semester	II					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		5	-	--	5	25	75	100

Learning Objectives

- Describe the core syntax and semantics of Python programming language.
- Describe the control structures of Python
- Discover the need for working with the strings and functions.
- Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.
- Understand the usage of packages and Dictionaries.

UNIT	Details	No. of Periods for the Unit
I	Introduction: The essence of computational problem solving – Limits of computational problem solving-Computer algorithms-Computer Hardware-Computer Software-The process of computational problem solving-Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types, Input / output.	**15**
II	Control Structures: Boolean Expressions - Selection Control - If Statement- Indentation in Python- Multi-Way Selection -- Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flag. String, List and Dictionary, Manipulations Building blocks of python programs,Understandig and using ranges.	**15**
III	Functions: Program Routines- Defining Functions- More on Functions: Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python - Default Arguments in Python-Variable Scope. Recursion: Recursive Functions	**15**
IV	Objects and their use: Software Objects - Turtle Graphics – Turtle attributes-Modular Design: Modules - Top-Down Design - Python Modules - Text Files: Opening, reading and writing text files – Database Programming: Connecting to a database, Creating Tables, INSERT, UPDATE, DELETE and READ operations, Transaction Control, Disconnecting from a database, String Processing - Exception Handling	**15**
V	Dictionaries and Sets: Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism. Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc.	**15**

Course Outcomes	
Course Outcomes	**Course Outcomes**
CO1	On completion of this course, students will
CO2	Develop and execute simple Python programs
CO3	Write simple Python programs using conditionals and looping for solving problems
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries etc.
	Read and write data from/to files in Python programs.

Text Books (Latest Editions)	
1	Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem solving Focus", Wiley India Edition, 2015.
2	Wesley J. Chun, "Core Python Applications Programming", 3rd Edition , Pearson Education, 2016
Reference Books	
1.	Mark Lutz, "Learning Python Powerful Object Oriented Programming", O'reilly Media 2018, 5th Edition.
2.	Timothy A. Budd, "Exploring Python", Tata MCGraw Hill Education Private Limited 2011, 1 st Edition.
3.	John Zelle, "Python Programming: An Introduction to Computer Science", Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1590282410
4.	Michel Dawson, "Python Programming for Absolute Beginers" , Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009
Web Resources	
1.	http://interactivepython.org/courselib/static/pythonds2
2.	http://www.ibiblio.org/g2swap/byteofpython/read/
3.	http://www.diveintopython3.net/http://greenteapress.com/wp/think-python-2e/

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	**S**	L	M	L	M	L	L	L
CO 2	M	**S**	M	M	M	L	L	L
CO 3	M	M	M	**S**	L	M	M	M
CO 4	M	M	M	M	M	**S**	M	M
CO 5	M	M	M	M	M	M	**S**	M

S-Strong M-Medium L-Low

Mapping with Programme Specific Outcomes:

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	3	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	2	2
CO5	3	3	2	3	3
Weightage	15	15	13	13	14
Weighted percentage of Course Contribution to Pos	70/75=93.3%				

Title of the Course		**Practical: Python Programming**						
PART		**III**						
Category	Core	**Year**	I	**Credits**	4	**Course Code**	**232703202**	
		Semester	II					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		-	1	4	5	25	75	100

Learning Objectives

- To implement the python programming features in practical applications.
- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries , turtles, Files and modules.

UNIT	Details	No. of Periods for the Unit
1	Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice	
2	Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria: ● Grade A: Percentage >=80 Grade B: Percentage >=70 and <80 ● Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60 Grade E: Percentage <40	
3	Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.	
4	Program to display the first n terms of Fibonacci series.	
5	Program to find factorial of the given number using recursive function.	
6	Write a Python program to count the number of even and odd numbers from array of N numbers.	
7	Python function that accepts a string and calculate the number of upper case letters and lower case letters.	
8	Python program to reverse a given string and check whether the give string is palindrome or not.	
9	Write a program to find sum of all items in a dictionary.	
10	Write a Python program to construct the following pattern, using a nested loop 1 22 333 4444 55555 666666 7777777 88888888 999999999	
11	Read a file content and copy only the contents at odd lines into a new file.	
12	Create a Turtle graphics window with specific size.	
13	Write a Python program for Towers of Hanoi using recursion	

14	Create a menu driven Python program with a dictionary for words and their meanings.
15	Devise a Python program to implement the Hangman Game**.**

Course Outcomes	**Course Outcomes**
CO1	On completion of this course, students will
CO2	To understand the problem solving approaches
CO3	To learn the basic programming constructs in Python
CO4	To practice various computing strategies for Python-based solutions to real world problems
CO5	To use Python data structures - lists, tuples, dictionaries.
	To do input/output with files in Python.

Text Books (Latest Editions)	
1	Charles Dierbach, "Introduction to Computer Science using Python - A computational Problem solving Focus", Wiley India Edition, 2015.
2	Wesley J. Chun, "Core Python Applications Programming", 3rd Edition , Pearson Education, 2016
Reference Books	
1.	Mark Lutz, "Learning Python Powerful Object Oriented Programming", O'reilly Media 2018, 5th Edition.
2.	Timothy A. Budd, "Exploring Python", Tata MCGraw Hill Education Private Limited 2011, 1 st Edition.
3.	John Zelle, "Python Programming: An Introduction to Computer Science", Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1590282410
4.	Michel Dawson, "Python Programming for Absolute Beginers" , Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009
Web Resources	
1.	http://interactivepython.org/courselib/static/pythonds2
2.	http://www.ibiblio.org/g2swap/byteofpython/read/
3.	http://www.diveintopython3.net/http://greenteapress.com/wp/think-python-2e/

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	**S**	L	M	L	M	L	L	L
CO 2	M	**S**	M	M	M	L	L	L
CO 3	M	M	M	**S**	L	M	M	M
CO 4	M	M	M	M	M	**S**	M	M
CO 5	M	M	M	M	M	M	**S**	M

S-Strong M-Medium L-Low

Mapping with Programme Specific Outcomes:

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	3	3
CO2	3	3	3	2	3
CO3	3	2	3	3	3
CO4	3	3	2	2	2
CO5	3	3	3	3	2
Weightage	15	14	13	13	13
Weighted percentage of Course Contribution to Pos	68/75=90.6%				

Title of the Course		**Information Security**						
PART		**III**						
Category	Elective II	**Year**	I	**Credits**	3	**Course Code**	**232703203**	
		Semester	II					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		4	-	-	4	25	75	100

Learning Objectives

- To know the objectives of information security
- Understand the importance and application of each of confidentiality, integrity, authentication and availability
- Understand various cryptographic algorithms
- Understand the basic categories of threats to computers and networks
- To study about the concepts of security in networks, web security

UNIT	**Details**	**No. of Periods for the Unit**
I	Introduction to Information Security : Security mindset, Computer Security Concepts (CIA), Attacks, Vulnerabilities and protections, Security Goals, Security Services, Threats, Attacks, Assets, malware, program analysis and mechanisms	**12**
II	The Security Problem in Computing: The meaning of computer Security, Computer Criminals, Methods of Defense. Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption	**12**
III	Symmetric and Asymmetric Cryptographic Techniques : DES, AES, RSA algorithms .Authentication and Digital Signatures : Use of Cryptography for authentication, Secure Hash function, Key management – Kerberos	**12**
IV	Program Security : Non-malicious Program errors – Buffer overflow, Incomplete mediation, Time-of-check to Time-of- use Errors, Viruses, Trapdoors, Salami attack, Man-in-the- middle attacks, Covert channels. File protection Mechanisms, User Authentication Designing Trusted O.S: Security polices, models of security, trusted O.S design, Assurance in trusted O.S. Implementation examples	**12**
V	Security in Networks : Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security. Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction.	**12**

Course Outcomes	
Course Outcomes	On completion of this course, students will;
CO1	Understand network security threats, security services, and countermeasures
CO2	Understand vulnerability analysis of network security
CO3	Acquire background on hash functions; authentication; firewalls; intrusion detection techniques
CO4	Gain hands-on experience with programming and simulation techniques for security protocols.
CO5	Apply methods for authentication, access control, intrusion detection and prevention

Text Books (Latest Editions)	
1	Security in Computing, Fourth Edition, by Charles P. Pfleeger, Pearson Education
2	Cryptography And Network Security Principles And Practice, Fourth or Fifth Edition, William Stallings, Pearson

Reference Books	
1.	Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, lst Edition
2.	Cryptography and Network Security : ForouzanMukhopadhyay, McGraw Hill, 2"d Edition
3.	Information Security, Principles and Practice: Mark Stamp, Wiley India
4.	Principles of Computer Sceurity: WM.Arthur Conklin, Greg White, TMH
Web Resources	
1.	https://www.geeksforgeeks.org/what-is-information-security/
2.	https://www.tutorialspoint.com/what-is-information-security#:~:text=Information%20security%20is%20designed%20and,destruction%2C%20alteration%2C%20and%20disruption.
3.	https://www.w3schools.com/cybersecurity/

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	S							
CO 2	M	S						
CO 3				S		S		
CO 4				S	S	M		
CO 5			S					S

S-Strong M-Medium L-Low

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	3	2
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	2
CO5	3	3	3	3	3
Weightage					
Weighted percentage of Course Contribution to Pos	71/75=94..6%				

Title of the Course		**Cyber Forensics**					
PART		**III**					
Category	EC - II	**Year**	I	**Credits**	3	**Course Code**	**232703204**
		Semester	II				

Instructional Hours per week	**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
	4	-	-	4	25	75	100

Learning Objectives

- Understand the definition of computer forensics fundamentals.
- To study about the Types of Computer Forensics Evidence
- Understand and apply the concepts of Duplication and Preservation of Digital Evidence
- Understand the concepts of Electronic Evidence and Identification of Data
- To study about the Digital Detective, Network Forensics Scenario, Damaging Computer Evidence.

UNIT	**Details**	**No. of Periods for the Unit**
I	***Overview of Computer Forensics Technology:*** *Computer Forensics Fundamentals: What is Computer Forensics? Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of professional Forensics Methodology, Steps taken by Computer Forensics Specialists. Types of Computer. Forensics Technology: Types of Business Computer Forensic, Technology–Types of Military Computer Forensic Technology–Types of Law Enforcement–Computer Forensic. Technology–Types of Business Computer Forensic Technology.*	**6**
II	**Computer Forensics Evidence and capture:** Data Recovery: Data Recovery Defined, Data Back–up and Recovery, The Role of Back – up in Data Recovery, The Data –Recovery Solution. Evidence Collection and Data Seizure: Collection Options, Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collections, Artefacts, Collection Steps, Controlling Contamination: The chain of custody.	**6**
III	**Duplication and Preservation of Digital Evidence:** Processing steps, Legal Aspects of collecting and Preserving Computer forensic Evidence. Computer image Verification and Authentication: Special needs of Evidential Authentication, Practical Consideration, Practical Implementation.	**6**
IV	**Computer Forensics Analysis:** Discovery of Electronic Evidence: Electronic Document Discovery: A Powerful New Litigation Tool. Identification of Data: Time Travel, Forensic Identification and Analysis of Technical Surveillance Devices.	**6**
V	**Reconstructing Past Events:** How to Become a Digital Detective, Useable File Formats, Unusable File Formats, Converting Files. Networks: Network Forensics Scenario, a technical approach, Destruction Of E–Mail, Damaging Computer Evidence, Documenting The Intrusion on Destruction of Data, System Testing.	**6**

Course Outcomes	
Course Outcomes	On completion of this course, the students will be able
CO1	Understand the definition of computer forensics fundamentals.
CO2	Evaluate the different types of computer forensics technology.
CO3	Analyze various computer forensics systems.
CO4	Apply the methods for data recovery, evidence collection and data seizure.
CO5	Gain your knowledge of duplication and preservation of digital evidence.

Text Books (Latest Editions)	
1	John R. Vacca, "Computer Forensics: Computer Crime Investigation", 3/E ,Firewall Media, New Delhi, 2002.
Reference Books	
1.	Nelson, Phillips Enfinger, Steuart,"Computer Forensics and Investigations" Enfinger, Steuart, CENGAGE Learning, 2004.
2.	Anthony Sammes and Brian Jenkinson,"Forensic Computing: A Practitioner's Guide", Second Edition, Springer–Verlag London Limited, 2007.
3.	.Robert M.Slade," Software Forensics Collecting Evidence from the Scene of a Digital Crime", TMH 2005.
Web Resources	
1.	https://www.vskills.in
2.	https://www.hackingarticles.in/best-of-computer-forensics-tutorials/
3.	https://www.softwaretestinghelp.com/digital-forensics/
4.	https://www.tutorialspoint.com/python_digital_forensics/index.htm

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	S							
CO 2	M	S						
CO 3				S		S		
CO 4				S	S	M		
CO 5			S					S

S-Strong M-Medium L-Low

Title of the Course		**Human Computer Interaction**					
PART		**III**					
Category	EC - II	**Year**	I	**Credits**	3	**Course Code**	**232703205**
		Semester	II				

Instructional Hours per week	**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
	4	-	-	4	25	75	100

Learning Objectives

- To learn about the foundations of Human Computer Interaction.
- To learn the design and software process technologies.
- To learn HCI models and theories.
- To learn Mobile Ecosystem.
- To learn the various types of Web Interface Design.

UNIT	**Details**	**No. of Periods for the Unit**
I	**FOUNDATIONS OF HCI :** ● The Human: I/O channels – Memory ● Reasoning and problem solving; The Computer: Devices – Memory – processing and networks; ● Interaction: Models – frameworks – Ergonomics – styles – elements – interactivity- Paradigms. - Case Studies	**6**
II	**DESIGN & SOFTWARE PROCESS:** ● Interactive Design: ● Basics – process – scenarios ● Navigation: screen design Iteration and prototyping. ● HCI in software process: ● Software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules: principles, standards, guidelines, rules. Evaluation Techniques – Universal Design	**6**
III	**MODELS AND THEORIES:** HCI Models : Cognitive models:- Socio-Organizational issues and stakeholder requirements Communication and collaboration models-Hypertext, Multimedia and WWW.	**6**
IV	**Mobile HCI:** ● Mobile Ecosystem: Platforms, Application frameworks ● Types of Mobile Applications: Widgets, Applications, Games ● Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools. - Case Studies	**6**
V	**WEB INTERFACE DESIGN:** Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow - Case Studies	**6**

Course Outcomes	
Course Outcomes	On completion of this course, the students will be able
CO1	Understand the fundementals of HCI.
CO2	Understand the design and software process technologies.
CO3	Understand HCI models and theories.
CO4	Understand Mobile Ecosystem, types of Mobile Applications, mobile Architecture and design.
CO5	Understand the various types of Web Interface Design.

Text Books (Latest Editions)	
1	Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, ”Human -Computer Interaction‖”, III Edition, Pearson Education, 2004 (UNIT I, II & III)
2	Brian Fling, —”Mobile Design and Development”, I Edition, O‘Reilly Media Inc., 2009(UNIT–IV)
3	Bill Scott and Theresa Neil, —Designing Web Interfaces‖, First Edition, O‘Reilly, 2009. (UNIT-V)
Reference Books	
1.	Shneiderman, “Designing the User Interface: Strategies for Effective Human-Computer Interaction”, V Edition, Pearson Education. The Human-Computer Interaction Handbook Fundamentals, Evolving Technologies and Emerging Applications, Second Edition, Andrew Sears, Julie A. Jacko, Julie A. Jacko, by Andrew Sears , Julie A. Jacko
Web Resources	
1.	https://www.interaction-design.org/literature/topics/human-computer-interaction
2.	https://link.springer.com/10.1007/978-0-387-39940-9_192
3.	https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction
4.	https://www.tutorialspoint.com/human_computer_interface/index.htm

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	**S**							
CO 2	**S**	**S**						
CO 3				**S**		**S**		
CO 4				**S**	**S**	**S**		
CO 5			**S**					**S**

S-Strong M-Medium L-Low

Title of the Course		**Introduction to Internet**						
PART		**III**						
Category	SEC – I NME	**Year**	I	**Credits**	2	**Course Code**	**234603227**	
		Semester	II					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		2	-	-	2	25	75	100

Learning Objectives

- To emphasize the importance of Networks, Topology and it s architecture.
- To specify the importance of Distributed Data Processing and its Pros and Cons and to give the brief introduction on Internet and World Wide Web.
- To reveal the ideas about the Email and its advantages and disadvantages.
- To give the definition of intranet and its differences from internet.
- To demonstrate about the HTML , XML and CSS.

UNIT	**Details**	**No. of Periods for the Unit**
I	Computer Networks: Introduction – Overview of a Network – Telecommunication Processors – Telecommunication Media – Telecommunications Software – Functions of Telecommunications Software – Types of Network – LAN, MAN,WAN. Network Topology – Star, Ring,Linear bus, Tree Topology. Network Protocols – Network Architecture.	**6**
II	Distributed Data Processing: Introduction – Distributing the Processing and Storage functions – Advantages of Distributed Systems – Disadvantages of Distributed Systems. Internet and World Wide Web: Introduction – Internet Access – Dial up connection , Direct Connection – Internet Protocols – TCP/IP. FTP, HTTP, Telnet , Gopher, WAIS.	**6**
III	Overview of Email: Introduction – How Email works? -Why Email? – Mailing Basics – Address book – File Attachments – Signature – Setting Priority – Email Ethics – Advantages and Disadvantages of Email - Emoticons.	**6**
IV	Introduction to Intranets: Introduction – Characteristics and Advantages of intranet – Basic benefits and drawbacks of intranet – Intranet vs Groupware – Intranet vs Email – Intranet vs client/server systems - Extranet.Introduction to E-Commerce and E-Business: Introduction – Ecommerce – ECommerce and EBusiness	**6**
V	Overview of Web Technologies: Introduction – HTML & HTML Tags – XHTML and Why XHTML – XML – CSS and uses of CSS – Java Script and PHP- Data Bases on the Web.	**6**

Course Outcomes

Course Outcomes	On completion of this course, the students will be able
CO1	To give the brief Introduction on Networks, Network Protocols and Topology.
CO2	To demonstrate about the distributed Data Processing , Internet and World Wide Web.
CO3	To lecture on Email and how to attach any documents along with it .
CO4	To summarize the important points on Intranets, Ecommerce and EBusiness.
CO5	To give the brief introduction about PHP, XML and CSS.

Text Books (Latest Editions)	
1	Alexis Leon and Mathews Leon , Fundamentals of Information Technology , 2nd Edition, L and L Consultancy Services Pvt Ltd., India.

UNIT	CHAPTER
I	21
II	23,24
III	25
IV	26,27
V	29

Reference Books	
1.	V.Rajaraman, Fundamentals of computers, 4th edition, Prentice Hall of India, New Delhi, 1999.
2.	R.S.Salaria, A gate way to Computer Literacy, Computer Fundamentals, Khanna Publishing.
3.	Thareja Reema, Fundamentals of Computers, 2nd Edition, Oxford Higher Education, 2020
Web Resources	
1.	https://www.tutorialspoint.com
2.	https://www.w3schools.com
3.	https://www.codecademy.com
4.	https://www.geeksforgeeks.org
5.	https://wikipedia.org

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**
CO 1	3	3	3	3	1
CO 2	2	2	2	3	3
CO 3	3	1	2	2	3
CO 4	1	3	3	3	2
CO 5	2	3	1	2	3

S-Strong M-Medium L-Low

Mapping with Programme Specific Outcomes:

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	3	3	3
CO2	2	2	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	2
CO5	2	3	3	1	3
Weightage	13	14	15	14	14
Weighted percentage of Course Contribution to Pos	70/75 = 94%				

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Title of the Course		**Practical: Web Designing**						
PART		**IV**						
Category	SEC - III	**Year**	I	**Credits**	2	**Course Code**	**234403227**	
		Semester	II					
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**	**CIA**	**External**	**Total**
		-	-	2	2	25	75	100

Learning Objectives

- To design the web page with different Tags and Tables
- To Develop the web site with hyper links and images.
- To reveal the ideas about how to develop the web pages with frames.
- To demonstrate about how to develop the web pages using if else , else if ladder in java script
- To use for loops and while loops in java script for the development of web pages.

UNIT	**Details**
1	Develop the web page for the creation of ID card with different color letters.
2	Develop the web page for the creation of class time table.
3	Develop the web page for displaying the newspaper information.
4	Develop the web site for the creation of your profile.
5	Develop the web page for the usage of the frame tag.
6	Develop the web page for the usage of IMG tag.
7	Develop the web page for the usage of MARQUEE tag.
8	Develop the web page for the displaying Alert message using Java Script.
9	Develop the web page for doing arithmetic operations using Java Script.
10	Develop the web page for displaying the newspaper information.
11	Develop the web page for String operations using Java Script.
12	Develop the web page for checking whether the given number is odd or even using Java Script.
13	Develop the web page for finding the larger between 2 numbers using if else statement in Java Script.
14	Develop the web page for finding the largest among 3 numbers using nested if else statement in Java Script.
15	Develop the web page for displaying the color code using switch case statement in Java Script.
16	Develop the web page for prime number checking using Java Script.

Text Books (Latest Editions)	
1	Eric Ladd and Jim O'Donnell, Using HTML 4, XML and JAVA 1.2, Platinum Edition, et al., Prentice Hall of India Private Limited, New Delhi – 110001,2003.
Reference Books	
1.	Bob Breelov etal., Web Programming Unleashed, Ist Edition, etal., Sams Net Publishing, .
2.	Laura Lemay, Rafe Colbum, Jennifer Kymin , Mastering HTML, CSS & Java Script , BPB Publications
3.	William Battle, Web Development for Beginners: Learn HTML/CSS/Java Script, White Belt Mastery.

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**
CO 1	3	3	3	3	1
CO 2	2	2	2	3	3
CO 3	3	1	2	2	3
CO 4	1	3	3	3	2
CO 5	2	3	1	2	3

S-Strong M-Medium L-Low

Mapping with Programme Specific Outcomes:

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	3	3
CO2	2	2	3	3	3
CO3	3	3	3	2	1
CO4	3	3	3	3	2
CO5	2	3	3	1	3
Weightage	13	14	14	12	13
Weighted percentage of Course Contribution to Pos	66/75 =88%				