DEPARTMENT OF COMPUTER SCIENCE

PREAMBLE

MASTER OF PHILOSOPHY [M. PHIL.]

CORE PAPERS

- Core paper for which syllabus has been modified is Research Methodology and Cloud Computing
- Core paper for which syllabus has been reduced is Security in Computing

MASTER OF COMPUTER APPLICATIONS

CORE COURSES

- New Syllabus framed for the courses Object Oriented Programming in Java and Advanced Java
- Syllabus modified for the courses Data Structures and Algorithms and Computer Networks
- Syllabus expanded for the course Computer Organization
- Syllabus reorganized for the course Programming in C
- The course Optimization Techniques and Fuzzy Sets converted into Optimization Techniques and new syllabus framed
- Lab list modified for the courses PC Package Lab and Software Development Framework Lab

ELECTIVE COURSES

- New Syllabus framed for the course Cloud Computing
- The courses Compiler Design and Customer Relationship Management have changed positions in II and III semesters respectively

EXTRA CREDIT COURSES

- Village Placement Programme has been reduced to 3 days instead of 5 days

M Sc INFORMATION TECHNOLOGY

CORE COURSES

- New Syllabus framed for the courses Object Oriented Programming in Java and Advanced Java
- Syllabus modified for the course Computer Networks and shifted from III semester to I semester
- The course Optimization Techniques and Fuzzy Sets is converted into Optimization Techniques and new syllabus framed and shifted from I semester to IV semester
- Lab list modified for the courses Advanced Java Lab and Software Development Framework Lab
- The Mobile Communications has been shifted from II semester to III semester

ELECTIVE COURSES

- New Syllabus framed for Mobile Application Development
- New Syllabus framed for the course Cloud Computing and shifted from II semester to IV semester and made as Core paper
- The course Open Technologies has been shifted from III semester to II semester and made as Core paper
- The course Soft Computing has been introduced

EXTRA CREDIT COURSES

- The course RDBMS Lab has been introduced

OTHERS

- Programme Structure modified
- Programme Specific Outcomes included
- Course outcomes included for all the courses

B Sc INFORMATION TECHNOLOGY

CORE PAPERS

- New syllabus has been framed for Data Structure using C Language
- Multimedia Lab I (Photoshop) and Multimedia Lab II (Macromedia Flash) has been combined and shifted to I Semester
- RDBMS Lab has been shifted from V Semester to IV Semester and converted as CORE paper
- RDBMS has been shifted from V Semester to IV Semester
- Operating system has been shifted from IV Semester to V Semester
- Java I has renamed as Programming in Java
- Computer Graphics has been shifted from V Semester to VI Semester and converted as Core paper

ALLIED

- Microprocessor lab list has been modified

ELECTIVE

- Data Communication has been removed and Complier design has been introduced
- E-Commerce has been shifted from VI Semester to V Semester and converted as Elective paper
- Java II has been removed and Ethical Hacking has been newly introduced

SKILL BASED ELECTIVE

- Core Paper Office Automation Lab has been converted to Skill Based Elective paper
- Linux and Shell Programming Lab has been shifted from I Semester to II Semester
- PHP Lab has been shifted from IV Semester to III Semester
- Software Development Framework Lab (ASP.NET) has been shifted from VI Semester to V Semester
- Visual Programming Lab has been shifted from IV Semester to V Semester and converted to Skill Based Elective
- Open Technology Lab (Python) has been newly introduced

EXTRA CREDIT PAPERS

- Visual Programming has been shifted from IV Semester to V Semester
- Multimedia has been shifted from V Semester to IV Semester

B Sc COMPUTER SCIENCE

CORE COURSES

- Introduction to Computers & Office Automation has been removed from I Semester and Fundamentals of Computers newly introduced
- Modification of syllabus for Programming in C
- Data Structures and Algorithms syllabus has been modified
- Python renamed as Open Technology

ALLIED COURSE

- Microprocessor lab list has been modified

SKILL BASED ELECTIVE COURSE

- Python Lab renamed as Open Technology Lab

EXTRA CREDIT COURSES

- Data Structures Lab newly introduced

OTHERS

- Programme Specific Outcomes included
- Course outcomes included for all the courses

B.COM WITH COMPUTER APPLICATIONS

CORE PAPERS

- The syllabus for Computer Fundamentals and Web Designing has been modified

ALLIED PAPERS

- In fourth semester Graphics and Animation, Graphics and Animation Lab(Flash) has been introduced

SKILL BASED ELECTIVE

- In sixth semester Designing Lab (Corel Draw) has been introduced

ALLIED PAPERS FOR OTHER UG PROGRAMME

- New Syllabus has been framed for Programming in C

DEGREE OF MASTER OF PHILOSOPHY [M. PHIL.]

(One Year Regular Programme)
(For those who joined since 2018-19)

PROGRAMME SPECIFIC OUTCOMES:

PSO1: Explore the various research areas in Computer Science and Application

PSO2: Develop scholars into researchers, able to make scientific contributions that have both practical significance and strengthen the various areas of Computer Science and Information Technology

PSO3: Attain theoretical, technical and research aspects that enable the students to grow into competent, seasoned professionals

PROGRAMME STRUCTURE

Sem	Subject code	Course	Subject Title	Hrs/ wk	Credit	CIA Marks	ESE Marks	Total Marks
I	GPCSC11	Core I	Research Methodology	6	6	25	75	100
	GPCSC12	Core II	Security in Computing	6	6	25	75	100
	GPCSC13	Core III	Professional Competency in Computer Science	6	6	100	-	100
		Library		6	-	-	-	-
		Dissertation Discussion		6	-	-	-	-
			Total	**30**	**18**	**150**	**150**	**300**
II	GPCSE2A / GPCSE2B	Elective I	a) Digital Image Processing / b) Cloud Computing	6	6	25	75	100
	GPCSC2PW	Core IV	Dissertation	16	12	100	100	200
		Library		8	-	-	-	-
			Total	**30**	**18**	**125**	**175**	**300**
			Grand Total	**60**	**36**	**275**	**325**	**600**

CORE I - RESEARCH METHODOLOGY

(For those who joined since 2018-19)

Semester : I **Hours / Week : 6**
Subject code : GPCSC11 **Credit : 6**

Course Outcomes:

CO1: Understand some basic concepts of research and its methodologies identify appropriate research topics

CO2: Understand the reliability and accuracy of the document to be presented by using the appropriate data gathering resources and the formulas or statistical tools that will be employed.

CO3: Search for knowledge, or as any systematic investigation, with an open mind, to establish novel facts, solve new or existing problems, prove new ideas, or develop new theories, usually using a scientific method.

CO4: Understand the methods of data collection and sampling design

CO5: Acquire knowledge about Fuzzy Logic, Graph Theory and Mathematical Logic

CO6: Able to understand Genetic Algorithms and Genetic Modeling.

UNIT I **[18 Hours]**

Research Methodology: An Introduction:- Meaning of Research – Objectives of Research – Motivation of Research- Types of Research – Research approaches – Significance of Research – Research methods versus Methodology – Research and scientific method – Importance of Knowing How Research is done – Research process – Criteria of Good Research – Problems encountered by Researchers in India

Defining the Research problem: Define Research Problem -Selecting the problem – Necessity of Defining the problem – Technique involved in defining a problem

Research Design: Meaning of Research Design – Need for Research Design – Features of a Good design – Important concepts relating to Research design – Different Research Designs – Basic Principles of experimental designs.

UNIT II **[18 Hours]**

Sampling Design: Census and Sample Survey- Implications of a Sample Design- Steps in Sampling Design-Criteria of selecting sampling procedure – Characteristics of a good sample design – Different types of sample designs –Selection of a Random Sample- Random Sample from an Infinite Universe – Complex Random Sampling Design

Methods of Data Collection: Collection of Primary data – Observation method – Interview method – Collection of data through questionnaires – Collection of data through schedules – Difference between questionnaires and schedules – some other methods of data collection – collection of secondary data- Selection of Appropriate Method for Data Collection

Interpretation and Report Writing: Meaning of Interpretation – Need of Interpretation- Technique of Interpretation – Precaution in Interpretation - Significance of Report Writing – Different steps in Writing report – Layout of the Research report – Types of Reports- Oral Presentation - Mechanics of Writing a Research Report – Precautions for Writing a Research Report

UNIT III **[18 Hours]**

MFC

Mathematical Logic: Introduction - Statements and Notations- Connectives- Normal Forms- The theory of Inference for the Statement Calculus- The predicate Calculus- Inference theory of the predicate Calculus

Graph Theory: Introduction- Basic Concepts of graph theory- Storage representation and Manipulation of graphs- Simple precedence grammars- Fault detection in combinational switching circuits- PERT and related techniques

UNIT IV **[18 Hours]**

The Weka machine learning workbench: Introduction to Weka

Learning algorithms Bayesian classifiers -Trees –Rules- Functions -Lazy classifiers -Miscellaneous classifiers

Clustering algorithms - Association-rule learners

Attribute selection Attribute subset evaluators -Single-attribute evaluators -Search methods

UNIT V **[18 Hours]**

Fuzzy Logic: Fuzzy set theory- fuzzy set Theory-Crisp sets-Fuzzy sets-Crisp Relations-fuzzy Relations

Genetic Algorithms: Fundamentals of Genetic Algorithms –Basic concepts-creation of off spring-working principle-Encoding-fitness function-Reproduction.

Text Books

1. C R Kothari, **Research Methodology: Methods and techniques,** New Age International Publications, second revised edition, 2004

2. J P Temblay and R Manohar, **Discrete Mathematical Structures with applications to computer science**, Tata -McGraw Hill Edition, Reprint 2009

3. Ian H. Witten, Eibe FrankData Mining, **Data Mining-Practical Machine Learning Tools and Techniques,** Elsevier Inc, **Second Edition,2005**
4. S. Rajasekaran and G.A. Vijayalakshmi Pai, **Neural Networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications**,Prentice hall of India,New delhi,2007

References

5. Dr. Jonathan Lazar, Dr. Jinjuan Heidi Feng and Dr. Harry Hochheiser, **Research Methods in Human Computer Interaction** , John Wiley and sons Ltd, New Delhi,2010
6. George J. Klir Bo Yoan, **Fuzzy sets and fuzzy logic theory and Applications**, First Edition, Prentice Hall of India Private LTD, New Delhi,1995
7. David E. Gold Berg, **Genetic Algorithms in search optimization and machine learning**, sixth edition, Pearson Education Pvt Ltd,1999
8. Michael D. Vose, **The simple genetic algorithm**, Prentice Hall of India private Ltd, New Delhi,2004.

CORE II - SECURITY IN COMPUTING

(For those who joined since 2018-19)

Semester : I **Hours / Week : 6**
Subject code : GPCSC12 **Credit : 6**

Course Outcomes:

CO1: Define the terms vulnerability, threat and attack

CO2: Understand the way in which computer memory is protected in the design of operating system

CO3: Understand the way in which trusted operating systems and data base systems are designed

CO4: Understand the prevention mechanisms of threats in a network

CO5: Know the legal, privacy and ethical issues and the security policies

CO6: Compare and contrast symmetric and asymmetric encryption systems

UNIT I **[18 Hours]**

Program Security: Secure Programs – Non malicious Program Errors – Viruses and other malicious code -Controls against program threats

Protection in General Purpose Operating System: Memory and address protection – Control of access to general objects – File protection mechanisms

UNIT II **[18 Hours]**

Designing Trusted Operating Systems: Define trusted Systems – Security policies – Models of security – Trusted operating system design

Data base Security: Introduction to Data bases – Security requirements – Reliability and integrity – Sensitive data – Inference

UNIT III **[18 Hours]**

Security in Networks: Threats in networks – Network security controls – Firewalls – Intrusion Detection system – Secure E- Mail.

UNIT IV **[18 Hours]**

Administering Security: Security planning – Risk Analysis – Physical Security

Legal, Privacy and Ethical Issues in Computer Security: Protecting programs and data – Information and the law – Software failures - Privacy – Ethical issues in computer security.

UNIT V **[18 Hours]**

Cryptography Explained: Mathematics for cryptography – Symmetric encryption – Public key encryption systems- Quantum cryptography.

Text Book

1. Charles P. Pfleeger and Sari Lawrence Pfleeger, **Security in computing**, Pearson Education, New Delhi,Third edition, 2003

References

77790736. Behrouz A Forouzan, **Cryptography and Netwotk Securit**, Tata McGraw Hills, Special Indian Edition, New Delhi,2007
77790737. Jaydip Sen **, Cryptography and Security in Computing**, InTech , First Edition, 2012
77790738. Jaydip Sen , **Applied Cryptography and Network Security**, InTech , 2012

CORE III - PROFESSIONAL COMPETENCY IN COMPUTER SCIENCE

(For those who joined since 2018-19)

Semester : I **Hours / Week : 6**
Subject code : FPCSC13/GPCSC13 **Credit : 6**

Course Outcomes:

CO1: Acquire a knowledge of open source software, BSD and GNU

CO2: Enhance the knowledge of complete understanding of open source software and various Statistical tools

CO3: Become familiar with Research Tools such as R tool and Scilab

CO4: Able to communicate with both technical and non-technical people from multiple domains and to help students become effective communicators and critical consumers of messages thus preparing them for life as an educated citizen and as a productive professional.

CO5: Able to understand the main features and significance of report

CO6: Able to Write the letter properly and write the Technical Report precisely

UNIT I **[18 Hours]**

Introduction: The concept of software freedom-motivations-consequences of the freedom of software.
A bit of History: Free software before free software-beginning BSD, GNU- everything in its way.
Legal aspects: Brief introduction to intellectual property-free software licenses. Case studies: Linux-Mozilla-Red Hat Linux.

UNIT II **[18 Hours]**

Social Networks: Google Docs- Blog –LinkedIn- Xing-Twitter- Google+ - Instagram- MySpace

UNIT III **[18 Hours]**

Research Tools
Fundamentals of R: Everything Varies- Significance- p values- Interpretation- Statistical Modeling
Data Frames: Selecting parts of Data frame Subscripts- sorting- Saving your work
Variance: Degree of freedom- Variance – Worked Sample- Variance and sample size- using variance-
Single Samples: Data summary in one sample case- The Normal Distribution - Calculating using z of the Normal Distribution- Plots for Testing Normality of Single Samples- Inference in the One-Sample Case- Student's t -Distribution.
Introduction: About this document- Install Scilab –Mailing list –Complementary resources-
Become familiar with Scilab: The general environment and the console- Simple numerical calculations- The menu bar- The editor- The graphics window- Windows management and workspace customization-
Programming: Variables, assignment and display- Loops- Tests -2 and 3D plots- Supplements on matrices and vectors –Calculation accuracy- Solving differential equations
Useful Scilab functions: In analysis- In probability and statistics- To display and plot- Utilities

UNIT IV **[18 Hours]**

Process of Communication: Objective- Introduction- Communication defined- The Process of Communication- Effective Communication-
Speaking Skills and Sub Skills: Objective- Features of good speech- Features of good speaker- Speaking skills and sub skills- Developing Speaking Skills

Features of Spoken English: Objective- Introduction- Features of Spoken English- Word Formation

UNIT V **[18 Hours]**

Precise Writing: Objective- Introduction- Steps of Precise Writing

Correspondence Letter Writing: Objective- Introduction- Types of Letter- Purpose of Writing Letter- C's of Communication- Structure of a Letter

Report Writing: Objective- Definitions- Main Features of a Report- Significance of a Report – Classification/ Types of Report – Routine/Periodic Report- Technical Report- How to write a Technical Report – Sample Reports

Text Books

1. Jesus M Gonzalez, Barahona, Joaquin Seoane Pascual, Gregories Robles , **Introduction to free software**, Free Technology Academy, 2009
2. Michael J Crawley, *Statistics:* **An Introduction using R**, John Wiley & Sons Ltd,New Delhi, 2005
3. **Scilab for very Beginners**,Scilab Enterprises, 2013
4. Dr. Seema Miglani, **Communication Skills-I,**Vayu Education of India,New Delhi, First Edition 2009
5. Dr. Seema Miglani, Shikha Goyal, Rohit Phutela, **Communication Skills- II**, Vayu Education of India,New Delhi, First Edition 2009

References

6. Harry Chambers, **Communication skills for Scientific and Technical Professional**, Perseus publishing, 2011
7. Alan Barkar, **Improve your Communication Skills,** Kokan Page, London, 2007

ELECTIVE I- a) DIGITAL IMAGE PROCESSING

(For those who joined since 2018-19)

Semester : II **Hours / Week : 6**
Subject code : FPCSE2A/GPCSE2A **Credit : 6**

Course Outcomes:

CO1: Understand the fundamental steps in digital image processing

CO2: Define the terms sampling and quantization

CO3: Use the mathematical principles of digital image enhancement (contrast, gradients, noise)

CO4: Know the steps in color image processing

CO5: Define and know about water marking techniques

CO6: Know about edge detection, Morphing and segmentation

UNIT I **[18 Hours]**

Introduction: Define Digital image processing– Origins of Digital image processing– Examples of fields that use digital image processing– fundamental steps in Digital image processing– components of an image processing system.

Digital Image Fundamentals: elements of visual perception – light and the electromagnetic spectrum – image sensing and acquisition – sampling and quantization – Some basic relationships between pixels – Arithmetic operations, set and logical operations.

UNIT II **[18 Hours]**

Intensity Transformations and Spatial Filtering: Background- Some Basic Intensity Transformation Functions-Histogram Processing-Fundamentals of Spatial Filtering-Smoothing Spatial filtering-Sharpening Spatial Filtering

Filtering in the Frequency Domain: Background- Preliminary concepts-Sampling and the Fourier Transform of Sampled Functions- the Discrete Fourier Transform of one variable- Extension of Functions of Two Variable-Some properties of the 2-D Discrete Fourier Transform

UNIT III **[18 Hours]**

Image Restoration and Reconstruction: A model of the image degradation/restoration process- Noise models – restoration in the presence of noise only – spatial filtering – periodic noise reduction by frequency domain filtering- linear, position –Invariant degradations – inverse filtering – minimum mean square error filtering – constrained least square filtering – geometric mean filter

Color Image Processing: Color fundamentals – color models – pseudo color image processing – Basics of full color image processing – color transformations – smoothing and sharpening – Image segmentation based on color– noise in color images – color image compression.

UNIT IV **[18 Hours]**

Wavelets and Multi resolution Processing: Background – Multi resolution expansions – wavelet transformation in one dimension – the fast wavelet transforms - wavelet transformation in two dimensions

Image Compression: Fundamentals – Some Basic compression methods – Digital image watermarking.

UNIT V **[18 Hours]**

Morphological Image Processing: Preliminaries –Erosion and Dilation– opening and closing – the hit-or-miss transformation – basic morphological algorithms –gray-scale morphology

Image Segmentation: Fundamentals- Point, Line and Edge detection-Thresholding – region-based segmentation – segmentation using morphological watersheds – the use of motion in segmentation.

Text Book

1. Rafael C.Gonzalez , Richard E. Woods, **Digital Image Processing**, Third edition, Pearson Education Pvt. Ltd, New Delhi,2012.

References

2. Anil K Jain **, Fundamental of Digital Image Processing,** Prentice Hall of India Pvt Ltd, New Delhi,2007
3. B. Chanda & D. Dutta Majimder , **Digital Image Processing and Analysis,** Prentice Hall of India Pvt Ltd, New Delhi,2006

ELECTIVE I- b) CLOUD COMPUTING

(For those who joined since 2018-19)

Semester : II **Hours / Week : 6**
Subject cod : GPCSE2B **Credit : 6**

Course Outcomes:

CO1: Articulate the main concepts, key technologies, strength and limitations of Cloud Computing

CO2: Identify the Architecture and Infrastructure of Cloud Computing

CO3: Able to choose the appropriate technologies, algorithms and approaches for the related issues in Cloud Computing

CO4: Understand the basic features of a cloud and determine its challenges, benefits, the infrastructure and the security aspects.

CO5: Understand the concept of Virtualization and Resource Provisioning in Clouds.

CO6: Acquire a broad knowledge on Aneka Cloud Application Platform, recent best practices, management and applications of Cloud Computing.

UNIT I **[18 Hours]**

Introduction to Cloud Computing: Introduction to Cloud Computing-Cloud Computing at a Glance-Historical Developments-Building Cloud Computing-Environments-Computing Platforms and Technologies

UNIT II **[18 Hours]**

Virtualization: Introduction-Characteristics of Virtualized Environments-Taxonomy of Virtualization Techniques-Virtualization and Cloud Computing-Pros and Cons of Virtualization-Technology Examples

UNIT III **[18 Hours]**

Cloud Computing Architecture: Introduction-Cloud Reference Model-Types of Clouds-Economies of the Cloud-Open Challenges

Secure Distributed Data Storage in Cloud Computing: Introduction -Cloud Storage: from LANs TO WANs -Technologies for Data Security in Cloud Computing-Open Questions and Challenges

UNIT IV **[18 Hours]**

Aneka: Cloud Application Platform: Framework Overview- Anatomy of the Aneka Container-Building Aneka Clouds- Aneka Task-Based Programming

UNIT V **[18 Hours]**

Advanced Topics and Cloud Applications: Cloud Applications-Scientific Applications-Business and Commerce Applications –Advanced Topics –Energy Efficiency in Clouds –Market Based Management of Clouds-Federated Clouds-Third Party Cloud Services

Text Books

1. Rajkumar Buyya, Christian Vecchiola and Thamarai Selvi, **Mastering Cloud Computing,** Tata McGraw Hill, New Delhi, 2013
2. Rajkumar Buyya, James Broberg, Andrzej Goscinski, **CLOUD COMPUTING Principles and Paradigms,** John Wiley & Sons, Inc., 2011

References

3. Toby Velte, Anthony Velte and Robert Elsenpeter, **Cloud Computing-A Practical Approach,** Tata McGraw Hill,New Delhi, 2010
4. Jeorge Reese, **Cloud Application Architectures : Building Applications and Infrastructure in the Cloud,** O'Reilly Applications , 2009
5. Michael Miller, **Cloud Computing: Web-Based Applications That Change the way you work and collaborate Online,** QUE publishing, 2009

CORE IV- DISSERTATION

(For those who joined since 2018-19)

Semester	**: I & II**	**Hours / Week**	**: 6 & 16**
Subject code	**: GPCSC2PW**	**Credit**	**: 12**

Project shall be done by individually

Course Outcomes:

CO1: Ability to communicate concepts and results to a technical audience in the form of conference papers, journal papers and/or oral presentations.

CO2: Clearly state and elaborate the objectives, research question/s and proposed outcomes for the dissertation.

CO3: Systematically and competently implement the method identified in the dissertation

CO4: Produce final dissertation outcomes of a high professional standard.

CO5: In-depth understanding of academic theory and the preparation of high-quality research pertinent to the field of study

CO6: Ability to select appropriate research methods and techniques suitable for the their research field

MASTER OF COMPUTER APPLICATIONS
(Three Years Regular Programme – AICTE approved)
(For those who joined since 2018-19)

PROGRAMME SPECIFIC OUTCOMES:

PSO1: Gaining understanding to apply knowledge of computing and technological advances in real life applications

PSO2: An ability to design, implement and evaluate computer-based systems to meet stakeholder needs

PSO3: A sense of professional, ethical, legal, security and social responsibilities

PROGRAMME STRUCTURE

Sem	Subject Code	Course	Subject Title	Hrs/ wk	Credit	CIA Marks	ESE Marks	Total Marks
I	GMCAC11	Core I	Digital Computer Fundamentals	4	4	40	60	100
	GMCAC12	Core II	Programming in C	4	4	40	60	100
	GMCAC13	Core III	Operating System	4	4	40	60	100
	GMCAC14	Core IV	Data Structures and Algorithms	4	4	40	60	100
	GMCAC15	Core V	Mathematical Foundations for Computer Science	4	4	40	60	100
	GMCAC16P	Core VI	PC Package Lab	4	3	40	60	100
	GMCAC17P	Core VII	Programming in C Lab	4	3	40	60	100
			Library/Browsing	1				
			Remedial/Games	1				
			Total	**30**	**26**	**280**	**420**	**700**
II	GMCAC21	Core VIII	Computer Organization	4	4	40	60	100
	GMCAC22	Core IX	Database Systems	4	4	40	60	100
	GMCAC23	Core X	Visual Programming	4	4	40	60	100
	GMCAC24P	Core XI	Visual Programming Lab	4	3	40	60	100
	GMCAC25P	Core XII	RDBMS Lab	4	3	40	60	100
	GMCAE2A / GMCAE2B	Elective I	a. Customer Relationship Management / b. Computer Graphics	4	4	40	60	100
	GMCAE2C / GMCAE2D	Elective II	a. Probability and Statistics / b. Distributed Computing	6	4	40	60	100
	GMCAX2	Extra Credit	Fluency in English		2		100	100
			Total	**30**	**26+2**	**280**	**420+ 100**	**700+ 100**
III	GMCAC31	Core XIII	Object Oriented Programming in Java	4	4	40	60	100
	GMCAC32	Core XIV	Optimization Techniques	4	4	40	60	100
	GMCAC33	Core XV	Computer Networks	4	4	40	60	100
	GMCAC34P	Core XVI	Java Lab	4	3	40	60	100
	GMCAC35P	Core XVII	Linux And Multimedia Lab	4	3	40	60	100

	GMCAE3A / GMCAE3B	Elective III	a. Compiler Design / b. Mobile Application Development	4	4	40	60	100
	GMCAE3C / GMCAE3D	Elective IV	a. Financial Cost and Management Accounting / b. Soft Computing	5	4	40	60	100
			Library/Browsing	1				
	GMCAX3	Extra Credit	Village Placement Programme (3 days during holidays)		2	100	-	100
			Total	**30**	**26+2**	**280 + 100**	**420**	**700+ 100**
IV	GMCAC41	Core XVIII	Advanced Java	4	4	40	60	100
	GMCAC42	Core XIX	Software Engineering	4	4	40	60	100
	GMCAC43	Core XX	Open Technologies	4	4	40	60	100
	GMCAC44	Core XXI	Information Security	4	4	40	60	100
	GMCAC45P	Core XXII	Advanced Java Lab	4	3	40	60	100
	GMCAC46P	Core XXIII	Open Technologies Lab	4	3	40	60	100
	GMCAE4A / GMCAE4B	Elective V	a. Digital Image Processing / b. Cloud Computing	4	4	40	60	100
			Library/Browsing	1				
			Remedial/Games	1				
	GMCAX4P	Extra Credit	Internship		2		100	100
			Total	**30**	**26+2**	**280**	**420 + 100**	**700+ 100**
V	GMCAC51	Core XXIV	Data Mining and Warehousing	4	4	40	60	100
	GMCAC52	Core XXV	Web Technology	4	4	40	60	100
	GMCAC53	Core XXVI	Software Development Framework	4	4	40	60	100
	GMCAC54	Core XXVII	Unified Modeling Language	4	4	40	60	100
	GMCAC55P	Core XXVIII	Web Designing Lab	4	3	40	60	100
	GMCAC56P	Core XXIX	Software Development Framework Lab	4	3	40	60	100
	GMCAE5A / GMCAE5B	Elective VI	a. Organizational Behavior / b. Software Testing	4	4	40	60	100
			Library/Browsing	1				
			Remedial/Games	1				
	GMCAX5O	Extra Credit	*Online Certification		2	-	-	-
			Total	**30**	**26 +2**	**280**	**420**	**700**
VI	GMCAC61PW	Core XXX	Project	18	12	100	100	200
	GMSED6	Extra Credit	Skills for Employability Development		2	100	-	100
			Total		**12 + 2**	**100 + 100**	**100**	**200 + 100**
			Grand Total	**150**	**142 +**	**1500 +**	**2200 +**	**3700+**

					10	**200**	**200**	**400**

***** For Online certification, credit alone will be assigned on submission of certificate obtained through appearing for Online Examination from edX, Swayam, Spoken Tutorial, NPTEL or Coursera, etc approved by the department

CORE I - DIGITAL COMPUTER FUNDAMENTALS

(For those who joined since 2018-19**)**

Semester : I **Hours/week: 4**
Code : FMCAC111 / GMCAC11 **Credit : 4**

Course Outcomes:

CO1: Attain Knowledge on digital and binary systems

CO2: Able to design digital circuits by simplifying the Boolean functions

CO3: Able to understand the design and realize the functionality of the computer hardware with basic gates and other components using combinational and sequential logic

CO4: Acquire knowledge on various Digital Integrated Circuits and construct Digital Circuits using HDL

UNIT I **[12 Hours]**

Binary Systems: Digital systems – Binary Numbers – Number Base Conversions – Octal and Hexadecimal Numbers – Complements – Signed Binary Numbers – Binary Codes – Binary Storage and Registers – Binary Logic.

Boolean algebra and Logic Gates: Basic Definitions – Axiomatic Definition of Boolean Algebra – Basic Theorems and Properties of Boolean Algebra – Boolean Functions – Canonical and Standard Forms – Other Logic Operations – Digital Logic Gates – Integrated Circuits

UNIT II **[12 Hours]**

Gate-Level Minimization: The Map Method – Four Variable Map – Five Variable Map – Product of Sums Simplification – Don't Care Conditions – NAND and NOR Implementation – Other Two-Level Implementations – Exclusive-OR Function – Hardware Description Language(HDL)

Combinational Logic: Combinational Circuits – Analysis Procedure – Design Procedure – Binary Adder-Subtractor – Decimal Adder – Binary Multiplier – Magnitude Comparator – Decoders – Encoders – Multiplexers – HDL for Combinational Circuits.

UNIT III **[12 Hours]**

Synchronous Sequential Logic: Sequential Circuits – Latches – Flip- Flops – Analysis of Clocked Sequential Circuits – HDL for Sequential Circuits – State Reduction and Assignment – Design Procedure.

Registers and Counters: Registers – Shift Registers – Ripple Counters – Synchronous Counters – Other Counters – HDL for Registers and Counters.

UNIT IV **[12 Hours]**

Memory and Programmable Logic: Introduction – Random-Access Memory – Memory Decoding – Error Detection and Correction – Read-Only Memory – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices.

Register Transfer Level: Register Transfer Level (RTL) Notation – Register Transfer Level in HDL – Algorithmic State Machines (ASM) – Design Example – HDL Description of Design Example – Binary Multiplier – Control Logic – HDL Description of Binary Multiplier – Design with Multiplexers.

UNIT V **[12 Hours]**

Asynchronous Sequential Logic: Introduction – Analysis Procedure – Circuits with Latches – Design Procedure – Reduction of State and Flow Tables – Race-Free State Assignment – Hazards – Design Example.

Digital Integrated Circuits: Introduction – Special Characteristics – Bipolar-Transistor Characteristics – RTL and DTL Circuits – Transistor-Transistor Logic (TTL) – Emitter-Coupled Logic(ECL) – Metal-Oxide Semiconductor(MOS) – Complementary MOS(CMOS) – CMOS Transmission Gate Circuits – Switch-Lever Modeling with HDL.

Text Book

1. M.Morris Mano, **Digital Design**, Prentice-Hall of India Private Limited, New Delhi Third Edition, 2005.

References

77791168. S.Salivahanan and S.Arivazhagan, **Digital Circuits and Design** , Vikas Publishing house Pvt.Limited, New Delhi,2000.

78464656. Malvino and Leach, **Digital Principles and Applications**, Tata McGrawHill Publishing Company Ltd, NewDelhi, 1991.

65042208. V.K. Puri, **Digital Electronics**, Tata McGrawHill Publishing Company Ltd, NewDelhi, 1997.

65042209. Morris Mano, **Digital Logic and Computer Design**, Prentice Hall of India,New Delhi,2004

CORE II - PROGRAMMING IN C

(For those who joined since 2018-19**)**

Semester : I **Hours/week : 4**
Code : GMCAC12 **Credit : 4**

Course Outcomes:

CO1: Acquire Knowledge about Operators and Expressions

CO2: Know Types of Branching and Looping Statements

CO3: Understand Character Array, String, Structure and Union

CO4: Know Pointers, File and Preprocessors concepts

UNIT I **[12Hours]**

Introduction: History of C –Importance of C – Basic Structure of C Programs - Constants, Variables and data types – Operators and Expressions – Input and Output Operations.

UNIT II **[12 Hours]**

Decision Making and Branching – Decision Making and Looping.

Arrays: One and Two Dimensional Arrays - Initializing Two Dimensional Arrays – Multidimensional Arrays-Dynamic Arrays.

UNIT III **[12 Hours]**

Character Arrays and Strings: Declaring and Initializing String Variables- Reading Strings from Terminal- Writing Strings to Screen – Arithmetic Operations on Characters - Putting Strings Together – Comparison of Two Strings - String Handling Functions – Table of Strings – Other Features of Strings .

User defined functions: Introduction – Need for User Defined Functions – A Multi-Function Program – Elements of User Defined Functions – Definition of Functions - Return Values and Their Types- Calling a Function – Function Declarations - Categories of Functions – Functions that Return Multiple Values – Nesting of Functions - Recursion - Passing Arrays to Functions - Passing Strings to Functions -The Scope and Lifetime of Variables.

UNIT IV **[12 Hours]**

Structures and Unions : Introduction – Defining and Declaring Structure – Accessing Structure Members –Structure Initialization – Copying and Comparing Structure Variables – Operations on Individual Members - Arrays of Structures – Arrays within Structures - Structures within Structures – Structures and Functions - Unions - Size of Structures – Bit fields.

Pointers : Introduction- Understanding Pointers - Accessing the Address of a Variable -Declaring and Initializing Pointers – Accessing a Variable through It's Pointer – Chain of Pointers - Pointer Expressions - Pointer Increments and Scale Factor – Pointers and Arrays – Pointers and Character Strings – Array of Pointers - Pointers and Functions – Pointers and Structures .

UNIT V **[12 Hours]**

Dynamic Memory Allocation and Linked Lists: Introduction – Dynamic Memory Allocation – Concepts of Linked Lists - Advantages of Linked Lists-Types of Linked Lists-Basic List Operations – Applications of Linked Lists.

File Handling: Defining and Opening a File – Closing a File – I/O operations on Files- Error Handling during I/O Operations-Random Access to Files – Command Line Arguments.

Preprocessor: Introduction - Macro Substitution - File Inclusion - Compiler Control Directives – ANSI Additions.

Text Book:

1. E Balagurusamy, **Programming in ANSI C**, Tata McGraw-Hill Publishing Company Ltd., New Delhi, Sixth Edition,2012.

References:

2. K R Venugopal, Sudeep R Prasad, **Programming with C**, Tata McGrawHill Publishing Company Ltd , New Delhi,1997.
3. Mullish Cooper, **The Spirit of C - An Introduction to Modern Programming**, Jaico Publishing House,Second Edition ,1988
4. Byron S. Gottfried, Jitender Kumar Chhabra, **Programming with C**, Tata McGraw Hill Publishing Company Ltd., New Delhi, Third Edition,2011.

CORE III - OPERATING SYSTEM

(For those who joined since 2018-19**)**

Semester : I **Hours/week: 4**
Code : FMCAC132 / GMCAC13 **Credit : 4**

Course Outcomes:

CO1: Acquire knowledge on functions, structures and history of operating systems

CO2: Able to understand the operating system components and its services

CO3: Able to demonstrate the mapping between the physical memory and virtual memory and memory management

CO4: Be familiar with process protection, security mechanisms, management concepts including scheduling, synchronization and deadlocks

UNIT I **[12 Hours]**

Introduction: Operating System -Mainframe systems- desktop systems- Multiprocessor Systems- Distributed systems- Clustered Systems- Real time systems- Hand held systems.

Operating System Structure: System components- Operating System services- System calls- - System structure- Virtual machines.

UNIT II **[12 Hours]**

Processes: Process concept- process scheduling- operations on processes- cooperating processes- Inter process Communication.

CPU Scheduling: Basic Concepts- Scheduling Criteria- Scheduling algorithms. **Process Synchronization**: Background- The critical system problem- semaphores- Classic problems of synchronization- Monitors.

UNIT III **[12 Hours]**

Deadlock: System Model-Deadlock Characterization- Methods of Handling Deadlock-Deadlock Prevention-Deadlock Avoidance- Deadlock Detection- Recovery from Deadlock.

Memory management: Background- Swapping- Contiguous memory allocation- Paging- Segmentation.

UNIT IV **[12 Hours]**

Virtual memory: Background- Demand paging- process creation- Page replacement

File system interface: File concepts- access methods- Directory structure

Mass storage structure: Disk structure- Disk Scheduling- Disk management- Swap space management- RAID structure.

UNIT V **[12 Hours]**

Distributed system structure: Background- Topology- Network types- communication- communication protocols.

Protection: Goals of protection- domain of protection- Access matrix- Implementation of Access matrix- revocation of access rights.

Security: The security problem- User authentication- Program threats- System threats- securing systems and facilities- Intrusion detection- Cryptography

Text Book

1. Silberschatz, Galvin, Gagne , **Operating System Concepts** , Wiley India Pvt. Ltd, New Delhi,VI edition, 2003

References

2. Milan Milenkovic ,**Operating System Concepts & Design** , Tata McGraw Hill Publishing Limited,New Delhi, II Edition, 1997
3. Dhananjay M. Dhamdhere, **Operating System A Concept-Based Approach**, Tata McGraw Hill Publishing Limited, New Delhi, III Edition,2012

CORE IV - DATA STRUCTURES AND ALGORITHMS

(For those who joined since 2018-19**)**

Semester : I **Hours/week : 4**
Code : GMCAC14 **Credit : 4**

Course Outcomes:

CO 1: Able to know the basics of algorithms and classification
CO 2: Acquire knowledge about linked list and trees
CO 3: Obtain skill about graph and AVL tree
CO 4: Know the various types of searching and sorting techniques

UNIT I **[12 Hours]**

Introduction: History of Algorithm-Data structures and Algorithms-Data structure-Definition and Classification

Stacks: Introduction-stack Operation-Application

Queues: Introduction-Operation-circular Queues-Other Types of Queues-Application

UNIT II **[12 Hours]**

Linked Lists: Introduction-Singly Linked Lists-Circularly Linked List-Doubly Linked List-Multiply Linked List-Application

Linked Stacks and Linked Queues: Introduction-Operation on Linked Stacks and Linked Queues-Dynamic Memory Management and Linked Stacks-Implementation of Linked Representations-Applications

Trees and Binary Tress: Introduction-Trees: Definition and Basic Terminologies-Representation of Trees-Binary Tree Traversals-Threaded Binary Trees-Applications

UNIT III **[12 Hours]**

Graphs: Introduction-Definitions and Basic Terminologies-Representations of Graphs-Graph Traversals-Single-source & All pairs shortest paths problem- Minimum cost spanning trees

Binary Search Trees and AVL Trees: introduction-Binary Search Trees: Definition and Operations-AVL Trees: Definition and Operations-Applications

UNIT IV **[12 Hours]**

B Trees and Tries: Introduction to m-way search Trees: Definition and Operations-B Trees: Definition and Operations-Tries: Definition and Operations-Applications.

Red-Black Trees and Splay Trees: Red-Black Trees-Splay Trees-Applications.

Hash Tables: Introduction-Hash Table Structure-Hash Functions-Linear Open Addressing-Chaining-Applications

UNIT V **[12 Hours]**

Searching: Introduction-Linear Search-Transpose Sequential Search-Interpolation Search-Binary Search-Fibonacci Search-Other Search Techniques.

Internal Sorting: Introduction-Bubble Sort-Insertion Sort-Selection Sort-Merge Sort-Shell Sort-Quick Sort-Heap Sort-Radix Sort.

Algorithms: Algorithm Specification - Performance analysis - Asymptotic notation.

Text Books

1. G A Vijayalakshmi Pai, **Data Structures and Algorithms, Concepts, Techniques and Application**, Tata McGraw Hill Education Private Limited, New Delhi, 2008
2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, **Fundamentals of Computer Algorithms**, Second Edition, Universities Press, 2008

References

3. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, **Data Structures And Algorithms**, Dorling Kindersley(India) Pvt. Ltd, New Delhi, 2013
4. R B Patel, **Expert Data Structures with C**, Khanna Book Publishing Co.(p) LTD, New Delhi, 2000

CORE V - MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE

(For those who joined since 2018-19**)**

Semester : I **Hours/week : 4**
Code : FMCAC151 / GMCAC15 **Credit : 4**

Course Outcomes:

CO 1: Acquire the basic knowledge of statements and connectives
CO 2: Acquire the knowledge of logical operations and predicate calculus needed for computing
CO 3: Get the basic knowledge of set theory, relation concepts and relation matrix needed for designing and solving problems
CO 4: Design and solve Boolean functions for defined problems and Understand the concepts of Graph and trees

UNIT I **[12 Hours]**

Statements and Notations-connectives- Negations-Conjunctions -Disjunctions –Statements Formulations and truth Tables – Conditional and Biconditional – Well-formed Formulas –Tautologies-Equivalence of Formulas –Duality Law- Tautological Implications – Formulas with Distinct Truth Tables Functionally Complete Sets of connectives –Other Connectives

UNIT II **[12 Hours]**

Normal Forms- The Theory of Inference for the Statement-The Predicate Calculus- Inference Theory of Predicate Calculus

UNIT III **[12 Hours]**

Set Theory: Basic concepts – Relations and Ordering:Relations- relation matrix and the graph of a relation – composition of binary relations

UNIT IV **[12 Hours]**

partially ordered set: Representation and associated terminology- Boolean algebra- Boolean Function-representation and minimization of Boolean functions

UNIT V **[12 Hours]**

Basic concept of Graph theory- Paths, Reachability and connectedness- Matrix representation of graphs-Trees- Storage Representation and Manipulation of Graphs

Text Book:

1.Trembley and Manohar R, **Discrete Mathematical Structures with Applications to Computer Science**, Tata McGraw Hill, New Delhi,2009.

References:

2. Narasingh Deo,**Graph Theory with Applications to Engineering and Computer Science**, Prentice Hall of India, New Delhi,2007.
3. Kenneth H.Rusen, **Discreate Mathematics and its Applications**, Tata McGraw Hill,New Delhi, Sixth Edition,2007.
4.Kenneth H Rosen,D**iscrete Mathematics and its Applications with Combinatorics and Graph Theory**,Tata McGrawHill Education Private Ltd,New Delhi,VII Edition,2012

CORE VI - PC PACKAGE LAB

(For those who joined since 2018-19**)**

Semester : I **Hours/week: 4**
Code : GMCAC16P **Credit : 3**

Course Outcomes:

CO1 : Create a document in Microsoft Word with formatting.

CO2 : Write functions in Microsoft Excel to perform basic calculations and to convert number to text and text to number.

CO3 : Create a presentation in Microsoft PowerPoint that is interactive and legible content.

CO4 : Develop a database including tables, queries, forms, and reports and develop database applications.

Word Processing

1. Design the time table given to you at the start of the Semester.
2. Prepare the given advertisement.
3. Prepare a job application form for college admission.
4. Prepare an application form for college admission.
5. Create a document using Macro (Recording and Running a Macro)

Spread Sheet

76783456. Prepare bar chart using chart wizard representing rainfall for the last 5 years. Assume the rainfall indices.

76783457. Prepare students mark list and calculate total, average, result, grade and rank.

76783458. Illustrate the numeric functions.

76783459. Illustrate the character functions.

76783460. Calculate Mean, Median and Mode.

76783461. Prepare employee pay bill and order them according to their salaries.

Presentation

76782928. Do a presentation with minimum of slides on the topic "MY NATION" using POWERPOINT with audio and video effects.

76782929. Do a presentation with minimum of slides on the topic "TOURISM" with pictures.

76782930. Do a presentation with minimum of slides on the topic "MY COLLEGE" using POWERPOINT with hyperlink and animation effects.

Database Management

76782931. Create a table on student marks details and query the table to list students who are getting greater than 90 marks in Mathematics.

76782932. Create a table on Employee details, update the salary using a form.

76782933. Prepare report on EB-Bill Calculation.

Note :- Questions for the external examination will be based on the concepts learnt.

CORE VII - PROGRAMMING IN C LAB

(For those who joined since 2018-19**)**

Semester : I **Hours/week : 4**
Code : GMCAC17P **Credit : 3**

Course Outcomes:

CO 1: Understand the programming approach to solve problems using a procedure oriented language

CO 2: Enhance the problem solving, programming and debugging skills

CO 3: Understand and differentiate decision making and looping structures

CO 4: Implement various data structures in programs

Conditional Statements

1. Program to find the largest and smallest among three numbers

Formula Substitution

2. Program to calculate arithmetic mean, median, variance & standard deviation.

Loop Structures

3. Program for number generation (prime, perfect, fibonacci ,etc.)
4. Program for number checking (prime, perfect, palindrome ,etc.)
5. Program for number conversion (decimal to binary ,decimal to octal ,etc.)

Arrays

6. Program to arrange numbers in ascending & descending order and strings in alphabetical order
7. Program to do linear search and binary search
8. Program to find maximum and minimum in a given set of numbers
9. Program to do matrix addition , subtraction, multiplication & transpose

Strings

10. Program for string manipulation (converting the case, reversing a string and checking whether palindrome)

Data Structures using Arrays

11. Program to implement stack operations using arrays
12. Program to implement queue operations using arrays

Functions

13. Program to simulate a calculator(arithmetic operations) using functions
14. Program to calculate the factorial and binomial coefficient (ncr) using recursion

Structures

15. Program to print employees details in table form using structures

Pointers

16. Program to get a set of integers and print them in reverse order using pointers

Files

17. Program to count the vowels in the file contents
18. Program to create a library file and print details

Linked Lists

19. Program to implement singly linked list (creation , insertion and deletion)
20. Program to concatenate and deconcatenate two linked lists

Note: - Questions for the external examination will be based on the concepts learnt

CORE VIII - COMPUTER ORGANIZATION

(For those who joined since 2018-19**)**

Semester: II **Hours/week : 4**
Code : GMCAC21 **Credit : 4**

Course Outcomes:

CO 1 : Understand the structure of computers and its internal organization
CO 2 : Classify the I/O organization and memory system
CO 3 : Describe the functions of processing unit
CO 4 : Understand the concepts of pipelining and parallel processing

UNIT I **[12 Hours]**

Basic Structure of Computers: Functional units – Basic operational concepts – Bus structures.
Machine Instructions and Programs: Memory locations and addresses – Memory operations – Instructions and instruction sequencing – Addressing modes – Basic Input/Output operations – Stacks and queues- Subroutines

UNIT II **[12 Hours]**

Input / Output Organization: Accessing I/O devices – Interrupts: Enabling and disabling interrupts – Handling multiple devices – Direct Memory Access: Bus Arbitration – Buses – Interface circuits – Standard I/O interfaces: Peripheral Component Interconnect (PCI) Bus – SCSI Bus – Universal Serial Bus (USB).

UNIT III **[12 Hours]**

Memory System: Basic concepts – Semiconductor RAM memories – Read-Only Memories: ROM – PROM – EPROM – EEPROM – Flash Memory – Cache memories: Mapping functions – Replacement algorithms – Virtual memories – Secondary storage: Magnetic Hard Disks – Optical Disks – Magnetic Tape Systems.

UNIT IV **[12 Hours]**

Basic Processing Unit: Some fundamental concepts – Execution of complete instruction: Branch Instructions – Multiple bus organization – Hardwired control: A Complete Processor – Micro programmed control: Microinstructions – Micro program Sequencing – Wide-branch Addressing – Micro instructions with Next-Address field – Prefetching Microinstructions – Emulation.

UNIT V **[12 Hours]**

Pipelining: Basic concepts – Data hazards – Instruction hazards: Unconditional Branches – Conditional Branches and Branch Prediction.
Large Computer Systems: Forms of parallel processing: Classification of Parallel Structures – Array processors – The structure of general purpose multiprocessors – Interconnection networks – Multi computers: Local Area Networks (LAN) – Ethernet (CSMA/CA) Bus – Token ring – Network of Workstations.

Text Book

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky**, Computer Organization**, McGraw Hill Publishing Company Limited , New Delhi, Fifth Edition, 2002

References

2. B. Govindarajalu, **Computer Architecture and Organization – Design Principles and Applications,** Tata McGraw Hill Publishing Company Limited , New Delhi , 2004
3. Linda Null & Julia Lobur, **Computer Organization and Architecture**, Narosa Publishing House , New Delhi , 2003

4. Rajkumar Shrivastav, **Computer System Architecture**, Dominant Publishers and distributors,New Delhi, 2003

CORE IX - DATABASE SYSTEMS

(For those who joined since 2018-19**)**

Semester : II **Hours/week: 4**
Code : FMCAC221 / GMCAC22 **Credit : 4**

Course Outcomes:

CO 1: Able to know the basic concepts of DBMS and RDBMS
CO 2: Know about database design and transaction processing management
CO 3: Acquire the knowledge about security in database, query execution and optimization
CO 4: Understand the concept of distributed and object oriented database

UNIT I **[12 Hours]**

Introduction to Database Systems: Introduction - File Management Systems (FMS) - Database Management Systems (DBMS) - FMS versus DBMS - An Overview of Database Management - Brief introduction to SQL - Embedded SQL - Dynamic SQL - DBMS Models - Database System Architecture.**The Relational Model:** Relational Databases Primer - Relational Database Characteristics - Relational Algebra - Relational Calculus - Database Integrity – Keys - Entity and Referential Integrity - Views.

UNIT II **[12 Hours]**

Database Design: Design Considerations - Functional Dependency - Normalisation and Normal Forms - Entity/Relationship (E/R) Modelling.**Transaction Processing and Management:** Transaction – Recovery - Transaction Models - Two-Phase Commit - Concurrency Problems – Locking - Concurrency Problems Revisited – Deadlocks - Transaction Serialisability - Two-Phase Locking - Isolation Levels.

UNIT III **[12 Hours]**

Database Security: Data Classification - Threats and Risks – Cryptography - Digital Signature - Database Control - Users and Database Privileges - Types of Privileges - Object Privileges - Taking Away Privileges - Filtering Table Privileges - Statistical Databases.**Query Execution and Optimisation:** Query Processing - Using Indexes - Optimiser Functionality - Implementing SELECT -Optimisation Recommendations - Database Statistics.

UNIT IV **[12 Hours]**

Distributed Databases: Distributed Database Concepts - Distributed Database Architectures - Advantages of Distributed Databases - Distributed Database Requirements - Distributed Database Techniques - Distributed Query Processing - Distributed Concurrency Control and Recovery - Distributed Deadlocks - Client/Server Computing and DDBMS - Date's 12 Rules.**Decision Support Systems, Data Warehousing and Data Mining:** Information and Decision Making - Data warehouse - Data Warehousing Concepts - Data Warehousing Approaches - Online Analytical Processing(OLAP).

UNIT V **[12 Hours]**

Object Technology and DBMS: An Introduction to Object Technology – Abstraction – Encapsulation – Inheritance - Object Technology and RDBMS - Object Oriented Database Management Systems(OODBMS)

Advanced Topics in DBMS: Deductive Databases - Internet and DBMS - Multimedia Databases - Digital Libraries - Mobile Databases

.

Text Book

1. Atul Kahate, **Introduction to Database Management Systems**, Pearson Education (Singapore) Pvt Ltd, 2004

References

65043072. Abraham Silberschatz, Henry F. Korth, S.Sudarshan, **Database System Concepts,** Tata McGraw Hill Publishing Limited, New Delhi,5th Edition, 1997

65043073. C.J.Date, **An Introduction to Database System**, Addison Wesley Publishers, Boston, 3rd Edition, 1998

CORE X -VISUAL PROGAMMING

(For those who joined since 2018-19)

Semester : II **Hours/week : 4**
Code : FMCAC431 / GMCAC23 **Credit : 4**

Course Outcomes:

CO1: Acquire knowledge on Database files and Advanced Data Handling

CO2: Able to understand GUI programming using Microsoft Foundation Classes

CO3: Able to understand Procedure-Oriented Window Applications

CO4: Get knowledge on OLE and ActiveX control in Visual C++ and Develop Simple window applications using the MFC

UNIT I **[12 Hours]**

Accessing Database Files: Visual Basic and Database Files-Using the Data control-Viewing a Database File-step-by-step-Navigating the Database in code-Using List boxes nad combo boxes as data-bound controls-Adding a lookup table and navigation-step-by-step-updating a databse file-preventing errors

Advanced Data Handling-Grids,Validation,Selection and SQL: Displaying Data in Grids-Validation and Error trapping-ProgrammingExample showing validation techniques-Recordsets-Reordering a table recordset-working with database fields-creating a new dynaset

UNIT II **[12 Hours]**

Graphics: Graphics environment-colors-graphics methods-layering-more properties for your graphics controls-simple animation-timer control-more graphics techniques-scroll bar controls-scroll bar events

Advanced Topics in Visual Basic: ActiveX-Dynamic Link Libraries-Object Linking and Embedding-Bisual Basic fro Applications-Multiple Document Interface-Defining shortcut menus-The Report Designer

UNIT III **[12 Hours]**

Concepts and tools for windows Applications: Windows Fundamentals-Programming concepts and vocabulary for windows-Visual c++ windows development tools.

Procedure-oriented Windows Applications: An application framework-Using a make or project utility-A complete windows program-Using SWP.C as a template-creating a pie chart application.

UNIT IV **[12 Hours]**

The Microsoft foundation Class library: The need for a foundation class library-MFC design considerations-Key features of the MFC library-It all begins with CObject-Key MFC classes-A simplified MFC application.

Windows Applications using the MFC: A simple application and template-drawing in the client area-a fourier series application with resources-A bar chart with resources

UNIT V **[12 Hours]**

Application and class wizards: The graph application-the word processor application

Getting Started with OLE: OLE features and specifications-creating container application-testing the container application.

Getting started with ActiveX controls: ActiveX controls-containers that can house ActiveX controls-creating a simple ActivX control with MFC-customizing the initial control-testing the TDCtrl ActivX control.

Text Books

1. Chris H.Pappas and William H Murray, **The Complete Reference Visual C++ 6**, Tata McGraw Hill Edition,New Delhi,2009.Chapters:20,21,22,23,24,25,26
2. Julia Case Bradley and Anita C.Millspaugh, **Programming in Visual Basic 6.0**, Tata McGraw Hill Edition,New Delhi,2004.Chapters:11,12,14,15

References

76783552. David J.Kruglinski,George Shepherd and Scot Wingo, **Programming Microsoft Visual C++**, WP publishers and Distributors P Ltd,Bangalore,2006.

76783553. Gary Cornell, **Visual Basic 6 From The Ground Up**, Tata McGraw Hill Edition,New Delhi,2005

76783554. Ramesh Bangia, **Power of Visual Basic 6.0** , Fire wall Media, New Delhi ,2009

CORE XI - VISUAL PROGRAMMING LAB

(For those who joined since 2018-19)

Semester : II **Hours/week: 4**
Code : FMCAC461P / GMCAC24P **Credit : 3**

Course Outcomes:

CO1: Able to Design, Create, Build, and Debug Visual Basic applications

CO2: Able to Use Visual C++ to design and build Window Applications with various tools and menu options

CO3: Demonstrate the use of radio and checkbox using wizard in Visual C++

CO4: Develop GUI programs using Microsoft Foundation Classes

DEVELOP VB APPLICATION FOR THE FOLLOWING

Control Array

1. Creation of Scientific Calculator

File Navigator

2. To perform the following file operations using Driver, Dir and File list box Components.

- Checking the type of files
- Display the content of the text.

Menu Tool

56680976. Creation of Notepad editor with menu option.

Database

56680977. Access the native Database and perform the following operation for a student to Add, Delete, Modify and View records.

65041008. Using third party Database (oracle) perform the following operations for a Employee to Add, Delete, Modify and View records.

DEVELOP VC++ APPLICATION FOR THE FOLLOWING

Window Creation

1. Creation of Simple window with title bar and status bar.
2. Creation of Window with menu to display message and clear the message

Resources

3. Creation of Bit map on the window.

Drawing Controls

4. Demonstrate the drawing controls like ellipse, rectangle, arc etc using menu.
5. Draw different objects using different style of the Pen.
6. Demonstrate the free hand drawing to draw any picture.
7. To demonstrate use of radio button and checkbox using wizards.
8. MFC program to demonstrate the use of dialogue box controls for filling up the student's application form.
9. MFC program to demonstrate the usage of list box by filling up the travel details.
10. Creation of notepad editor with menu options.

Control Array

11. Creation of simple calculator.

Database

12. Demonstration of Database accessing for Student's Information.
13. Demonstration of Database accessing for Employee's Information.

Designing Web Page

14. Demonstrate Enquiry System (about courses offered, fees structure, Hostel facility) of College.
15. Demonstrate Railway Reservation Enquiry System (about train name and timings, no. of seats available in each class, waiting list etc.)

Note:-Questions for the external examination will be based on the concepts learnt

CORE XII - RDBMS LAB

(For those who joined since 2018-19**)**

Semester : II **Hours/week: 4**
Code : FMCAC251P / GMCAC25P **Credit : 3**

Course Outcomes:

CO1: Gain knowledge about how to create and manage own database
CO2: Acquire knowledge to implement the all types of queries and constraints in SQL
CO3: Able to use of various types of operators and clauses in SQL
CO4: Understand and use of PL/SQL block program

DDL

1. Write queries to create your own database and grant and revoke privileges

65041584. Create an address table with fields name , doorno , street & city and implement the following DDL queries

- describe its structure
- alter the table to include pincode
- alter the table to modify street column
- truncate and drop the table

DML

65042064. Create an inventory table with fields itemno, itemname, qnty , priceperitem, and orderlevel and the following DML queries

- insert records
- delete the item with itemname horlicks
- update the price field with price-5 for qnty above 15
- truncate the table
- drop the table

65043504. Create a student table with fields regno, name, English,tamil,maths and total & insert values excluding total

- Update the table by calculating total
- Arrange all records in descending order of name
- Find the student who got first mark in maths
- Find the student who got last mark in tamil
- List out the students whose name starts with 'R'

5. Create an employee table with fields eno , ename , sex ,age & years of experience

- find out the no. of female employees
- find out the employees with age ranging between 30 and 35
- list out the employees who are working more than 5 years
- find out the total no. of employee working

TCL

6. SQL queries to illustrate TCL commands(savepoint, rollback and commit)

Comparison Operators

7. Create an item table with fields itemno, itemname, quantity , price and insert records, to illustrate all comparison operators

Built in Functions

8. Create necessary tables and insert records to perform the all set operations
9. Create queries to illustrate all number functions
10. Create queries to illustrate all string functions
11. Create queries to illustrate date & time functions
12. Create queries to implement all aggregate functions

Constraints

13. Create a vendormaster table with fields vencode, venname, place and phoneno.Create a ordermaster table with fields itemno, itemcode, vencode, qnty, orderdate and Illustrate all constraints

Join

14. Create person table with fields p-id as primary key, firstname, lastname, address,city. Create orders table with fields o-id as primary key,orderno, p-id to illustrate equi join, non-equi join and outer join.

Sequence

65043936. Create a sequence which starts with 1000 , increment value by 1 and insert it as empno in the emp table

Group by clause

65043937. Create a player table with fields name, sports(cricket, hockey, etc.), age & country

- find out the eldest and youngest player
- group players according to sports
- list out the Indian players

PL/SQL

Formula Substitution

65044368. Write PL / SQL block to find out the largest among three numbers

65044369. Write PL/SQL block to print the multiplication table for given multiplier

Procedure

65044370. Create a student table with fields regno, name, maths ,physics &biology and insert records. Write a PL/SQL block to find the total , average & grade using procedure

65147264. Create a client table with the following fields client name, date of voice, amount and insert 10 records using procedure.

65147265. Create an item table with fields itemcode,itemname& qnty.Write a PL/SQL block using procedure to find out whether item can be issued or not by passing itemcode & itemneeded as parameters. If items issued, do the necessary updation in the table .Otherwise print appropriate message

User defined function

65147744. Write a PL/SQL block to find sum of digits of a given number using function

65147745. Write a PL/SQL block to find the factorial of a given number using function

Cursor

65147746. Create an employee table with fields eno, ename, designation & salary

Write a PL/SQL block using function to find out the bonus for the employee using explicit cursor for the following conditions

- if salary < 5000 , no bonus
- if salary >= 5000 & <10000 , bonus 2% of salary
- if salary >= 10000 & < 20000 , bonus 3% of salary
- if salary >= 20000 ,bonus 5% of salary

65148272. Create a library table with fields accno,title author and price & insert records and

Write a PL/SQL block to find searching book is available or not using illustrate implicit cursor

65148704. Create a table with fields eno,ename,salary and years of experience. Write a PL/SQL block using explicit cursor to give an increment of Rs 2000 in the salary for those who are having experience more than 10 years

65150624. Create necessary tables for Railway reservation system and write PL/SQL block to perform the following operations.

a. To show the train between important stations
b. To show the seat availability
c. To show the train type information
d. To reserve the train

Exception

65149280. Create sports table with fields sports_name, sports_name, country_name, age, sex and insert records and Write a PL/SQL block to illustrate the predefined exception DUP_VAL_ON_INDEX

65149760. Create hospital table with fields patient_id, patient_name, patient_complaint, doctor_id, doctor_name, remarks. Write a PL/SQL block to illustrate the following predefined exceptions like too_many_rows and no_data_found

65150192. Create a table with fields itemno,itemname, qntyordered & qntydelivered and Write a PL/SQL block using userdefined exception to indicate when more items have been delivered than ordered

Note :- Questions for the external examination will be based on the concepts learnt

ELECTIVE I (A) – CUSTOMER RELATIONSHIP MANAGEMENT

(For those who joined since 2018-19)

Semester : II **Hours/week: 4**
Code : FMCAE31A / GMCAE2A **Credit : 4**

Course Outcomes:

CO1 : Measure the importance of CRM for business success.

CO2 : Assess your own impact on customers and identify ways to improve it.

CO3 : Understand the characteristics of 'The Likeable Organisation' and apply them.

CO4 : Utilise a 'toolkit' that will enable you to build customer relationships.

UNIT I **[12 Hours]**

Introduction to CRM: Definition and applications – the purpose and benefits of CRM – components of CRM – business constructs related to CRM – users and need of CRM.

History and Development : The origins of CRM – the current need for CRM – Organizations' experiences with CRM – challenges in implementing CRM – developing CRM from a tactical perspective – extending the meaning and application of CRM

UNIT II **[12 Hours]**

Relationship Marketing and CRM: The roots of relationship marketing – relationship marketing and its domain – Relationship marketing as a paradigm shift- applicable situations – relationship marketing and the characteristics of a relationship – relationship marketing and CRM- organizing for CRM.

Organization and CRM : Introduction : the human factor – organization environment – value chain organization – other considerations

UNIT III **[12 Hours]**

Sales strategy and CRM: the new sales challenge – expansion of sales and CRM – CRM and strategy – sales processes and participation in CRM – The R in CRM – CRM and sales organizations – the sales customer relationship cycle

CRM technology and sales : technology and sales – customers and information – sales force communication – sales force automation technology – CRM systems and SFA applications – product information.

Marketing Strategy and CRM : key constructs in the customer-company profit chain – service quality and customer satisfaction – customer satisfaction – customer loyalty – retention – factors between satisfaction and loyalty- relationship between customer loyalty and company profitability – the CRM strategy cycle- customer communication – marketing automation

UNIT IV **[12 Hours]**

CRM and Data Management: Introduction – managing customer interactions – the customer integration problem – customer data integration definition and requirements – householding concepts – customer data integration steps

Technology and Data Platforms : Introduction – technology evolution – marketing technology development path – other emerging technology influencers – best practices.

Database and Customer data development: Introduction- data defined – data capture and allocation – data transformation – data mining – enabling CRM

UNIT V **[12 Hours]**

CRM Program Measurement and tools: Introduction – Areas requiring measurement – service quality, customer satisfaction, retention and loyalty – CRM customer cycle measures – Company 3E measures – determining customer value and customer equity – customer and company worth measures- marketing research and customer knowledge – CRM scorecards and the CRM measurement hierarchy.

Privacy and Ethics considerations: Introduction – consumer privacy concerns – organization privacy concerns – current/pending privacy legislation

Text Book

1. Roger J Baran, Robert J.Galka, Daniel P Strunk, **Customer Relationship Management**, Cengage Learning India Private Limited, New Delhi ,2008.

References

70717584. Kaushik Mukherjee, **Customer Relationship Management – A Strategic Approach To Marketin***g*, Prentice Hall of India Private Limited, New Dehi, 2007.

70717585. Jill Dyche, **The CRM Handbook – A Business Guide to Customer Relationship Management**, Dorling Kindersley(India) Pvt. Ltd, Noida, 2002.

70717586. P P Singh, N. Jinender Kumar, **Customer Relationship Management**, Regal Publications, New Delhi, 2009.

ELECTIVE I (B) - COMPUTER GRAPHICS

(For those who joined since 2018-19**)**

Semester : II **Hours/week : 4**
Code : FMCAE21B / GMCAE2B **Credit : 4**

Course Outcomes:

CO1: Understand Drawing Algorithms

CO2: Types of Clipping Operations

CO3: Differentiate Two and Three Dimensional Viewing Function

CO4: Types of Color Models and Color Transformation in Computer Graphics

UNIT I **[12 Hours]**

A Survey of Computer Graphics: Computer-Aided Design-Presentation Graphics- Computer Art-Entertainment- Education and Training- Visualization- Image Processing- Graphical User Interface.**Overview of Graphics Systems:** Video Display Devices- Raster Scan Systems- Random Scan Systems- Graphics Monitors and Workstations- Input Devices- Hard Copy Devices- Graphics Software

UNIT II **[12 Hours]**

Output Primitives: Points and Lines- Line-Drawing Algorithms- Loading the 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 III **[12 Hours]**

Two Dimensional Transformations: Basic Transformation-Matrix Representation of Homogenous Coordinates-Composite transformation-Other Transformation.**Two Dimensional viewing**: The viewing pipeline- Viewing coordinate Reference Frame –Window to View port coordinate transformation- Two-dimensional viewing functions- Clipping operations- Point clipping – Line clipping- Polygon clipping-curve clipping –Text clipping-Exterior Clipping.

UNIT IV **[12 Hours]**

Three dimensional Concepts:Three dimensional Display methods- Three dimensional Graphics.**Three dimensional Geometric and Modeling Transformation**:Translation-Rotation-Scaling-Other Transformation-Composite Transformation-Modeling and Coordinate.**Three dimensional Viewing**: Viewing pipeline-Viewing coordinates- projections-View volumes and general projection transformations-clipping- Hardware implementations- Three-dimensional Viewing.

UNIT V **[12 Hours]**

Color Models and Color Applications: Properties of light- Standard Primaries and the Chromaticity Diagram- Intuitive Color Concepts- RGB Model- YIQ Color Model- CMY Color Model-HSV Color Model- Conversion between HSV and RGB Models- HLS Color Model- Color selection and Applications.**Computer Animation**: Design of Animation sequences-General Computer Animation Functions- Raster Animations- Computer Animation Languages- Key Frame Systems- Motion Specification.

Text Book

1. Donald hearn, M.Pauline Baker, **Computer Graphics**, Prentice hall of India Pvt.Ltd., New Delhi, II edition, 2001

References

2. Amarendra N Sinha Arun Dudai, **Computer Graphics**, Tata Mc Graw Hill Publishing Company limited, New Delhi, 2008
3. William M.Newman, Robert F.Sproull, **Principles of Interactive Computer Graphics**, Tata McGraw Hill International,II Edition,1997
4. Van Dam, Feiner, Hughen, **Computer Graphics Principles And Practice**, Foley Addision Wesley publishing Company, II Edition, 1990

ELECTIVE II (A) – PROBABILITY AND STATISTICS

(For those who joined since 2018-19)

Semester : II **Hours/week: 6**
Code : GMCAE2C **Credit : 4**

Refer Syllabus by the Board of Studies of the Department of Mathematics

ELECTIVE II (B) – DISTRIBUTED COMPUTING

(For those who joined since 2018-19)

Semester : II **Hours/week: 5**
Code : FMCAE21D/ GMCAE2D **Credit : 4**

Course Outcomes:

CO1 : Differentiate among concurrent, distributed and networked computing.

CO2 : Implement Remote procedure calls, IPC mechanisms in distributed systems.

CO3 : Describe the advantages and approaches used to solve problems in the distributed computing environment skill.

CO4 : Have the ability to implement selected algorithms for distributed computing systems

UNIT I **[15 Hours]**

Introduction: Definition of a Distributed System-Goals-Types of Distributed Systems. **Architectures:** Architectural Styles - System Architectures-Architectures versus Middleware-Self-Management in Distributed Systems.

Processes: Threads-Clients-Servers-Code Migration-Software Agents.

UNIT II **[15 Hours]**

Communication: Fundamentals-Remote procedure Call-Message-Oriented Communication- Stream-Oriented Communication- Multicast Communication.

Naming: Names ,Identifiers and Addresses-Flat Naming- Structured Naming-Attribute based Naming.

UNIT III **[15 Hours]**

Synchronization: Clock Synchronization-Logical Clock- Mutual Exclusion Global Position of Nodes-Election Algorithm.

Consistency and Replication: Introduction-Data Centric consistency Models-Client centric consistency Models-Replica Management-Consistency Protocols.

UNIT IV **[15 Hours]**

Fault Tolerance: Introduction to Fault Tolerance-Process Resilience-Reliable client-server communication-Reliable group communication-distributed Commit-Recovery.

Security: Introduction to Security-Secure Channels-Access Control-Security Management.

UNIT V **[15 Hours]**

Distributed Object-based Systems: Architecture – Processes – Communication – Naming – Synchronization - Consistency and replication - Fault Tolerance - Security.

Distributed File System: Architecture – Processes – Communication – Naming – Synchronization - Consistency and replication - Fault Tolerance - Security

Text Book

1. Andrew S.Tanenbaum and Maarten Van Steen, **Distributed Systems Principles And Paradigms**, Pearson Education,New Delhi,2nd Edition, 2007

Reference

2. George Coulouris, Jean Dellimore and Tim KIndberg, **Distributed Systems Concepts and Design**, Pearson Education,New Delhi, 4th Edition, 2005

CORE XIII - OBJECT ORIENTED PROGRAMMING IN JAVA

(For those who joined since 2018-19)

Semester : III **Hours/week: 4**
Code : GMCAC31 **Credit : 4**

Course Outcomes:

CO1: Able to understand the fundamentals of JAVA

CO2: Able to make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API

CO3: Acquire knowledge about Multithreading and Exception Handling concept

CO4: Obtain knowledge on Applets and Swing concepts

UNIT I **[12 Hours]**

Java Programming Fundamentals: The JAVA Language-The Key Attributes of Object-Oriented Programming- The Java Development Kit-A First Simple Program-Handling Syntax Errors-Create Blocks of Code-The Java Keywords-Identifiers in Java-The Java Libraries

Introducing Data Types and Operators: Why Data Types Are Important-Java's Primitive Types-Literals-A Closer Look at Variables-The Scope and Lifetime of Variables-Operators-Arithmetic Operators-Relational and Logical Operators-Short-Circuit Logical Operators-The Assignment Operator-Shorthand Assignments- Type Conversion in Assignments-using a Cast-Operator Precedence-Expressions

Program Control Statements: Input Character from the Keyword-The if Statement-Nested ifs- The if-else-if Ladder- The switch Statement-Nested switch Statement- The for Loop- Some Variations on the for loop- Declaring Loop Control Variables Inside the for Statement-The Enhanced for Loop- The while Loop-The do-while Loop- Used break to Exit a Loop- Use break as a Form of goto-Use continue-Nested Loops

UNIT II **[12 Hours]**

Introducing Classes, Objects and Methods: Class Fundamentals- How Objects are Created-Reference Variables and Assignment- Methods-Returning from a Method-Returning a Value- Using Parameters-Constructors-Parameterized Constructors- The new Operator Revisited- Garbage Collection and Finalizers-The this Keyword

More Data Types and Operators: Arrays- Multidimensional Arrays- Alternative Array Declaration Syntax-Assigning Array References-Using the length Member-The For-Each Style for Loop- Strings-Using the Command-Line Arguments- The Bitwise Operators-The ? Operator

A Closer Look at Methods and Classes: Controlling Access to Class Members-Pass Objects to Methods-How Arguments are Passed- Returning Objects- Method Overloading- Overloading Constructors-Recursion-understanding static- Introducing Nested and Inner Classes

UNIT III **[12 Hours]**

Inheritance: Inheritance Basics- Member Access and Inheritance- Constructors and Inheritance- Using super to Call Superclass Constructors- Using super to Access Superclass Members-Creating a Multilevel Hierarchy –When are Constructors Executed?- Superclass Reference and Subclass Objects-Method Overriding –Overridden Methods Support Polymorphism-Overridden Methods-Using Abstract Classes-Using final- The Object Class

Interfaces: Interface Fundamentals- Creating an Interface-Implementing an Interface- Using Interface References-Implementing Multiple Interfaces-Constants in Interfaces-Interfaces Can Be Extended-Nested Interfaces- Final Thoughts on Interfaces

Packages: Package Fundamentals-Packages and Member Access- Importing Packages-Static Import

UNIT IV **[12 Hours]**

Exception Handling: The Exception Hierarchy-Exception Handling Fundamentals – The Consequences of an Uncaught Exception-Exceptions Enable You to Handle Errors Gracefully-Using Multiple catch Clauses- Catching Subclass Exceptions –try Blocks Can Be Nested- Throwing and Exception –A Closer Look at Throwable -Using finally-Using throws –Java's Built-in Exceptions-New Exception Features Added by JDK 7-Creating Exception Subclasses

Using I/O: Java's I/O Is Built on Streams-Byte Streams and Character Streams-The Byte Stream Classes-The Character Stream Classes-The Predefined Streams- Using the Byte Steams- Reading and Writing Files Using Byte Streams- Automatically Closing a File- Reading and Writing Binary Data-Random-Access Files- Using Java's Character-Based Streams-File I/O Using Character Streams

UNIT V **[12 Hours]**

Multithreaded Programming: Multithreading Fundamentals-The Thread Class and Runnable Interface-Creating a Thread- Creating Multiple Threads- Determining When a Thread Ends-Thread Priorities-Synchronization-Using Synchronized Methods- The synchronized Statement-Thread Communication Using notify(), wait(), and notifyAll()-Suspending, Resuming and Stopping Threads

Enumeration, Autoboxing and Annotations: Enumerations- Java Enumerations are Class Types- The values() and valueof() Methods- Constructors, Methods, Instance Variables and Enumerations-Enumeration Inherit Enum- Autoboxing – Annotations

Applets and the Remaining Java Keywords: Applet Basics-A Complete Applet Skeleton-Applet Initialization and Termination- A key Aspect of an Applet's Architecture- Requesting Repainting- Using the Status Window- Passing Parameters to Applets-The Remaining Java Keywords

Text Book:

1. Herbert Schildt and Dale Skrien, **Java Fundamentals-A Comprehensive Introduction**, Tata McGraw Hill Education Private Limited, New Delhi, 2013

References:

70718016. Mahesh P. Bhave and Sunil A Patekar, **Programming with JAVA**, Dorling Kindersley Private Limited, 2009

70718017. Paul Deitel and Harvey Deitel, **Java How to Program,** PHI Learning Private Limited, New Delhi, Seventh Edition, 2010

70718018. keyur Shah, **Java 2 Programming,** Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002

CORE XIV - OPTIMIZATION TECHNIQUES

(For those who joined since 2018-19**)**

Semester : III **Hours/week: 4**

Code : GMCAC32 **Credit : 4**

Course Outcomes:

CO 1: Understand the need of using operations research- a quantitative approach for effective decision making and interpret the solution of an LP model

CO 2: Convert an LP problem into its standard form by adding slack, surplus and/or artificial variables

CO 3: Apply the Hungarian method to solve an assignment problem and handle the problem of degenerate and unbalanced transportation problem

CO 4: Differentiate PERT and CPM

UNIT I **[12 Hours]**

Introduction: Operations Research – A quantitative perspective to decision making-History—Definitions-Features-OR approach to problem solving-Models and modelling –Methods for solving OR models-Methodology -Applications-Computer Software for Operations Research

Linear Programing: Structure of LP model-Advantages of using LP-Limitations-Applications-General Mathematical model of LPP-Guidelines on LP model formulation-Examples

Graphical Method: Important definitions-Graphical Solution methods of LP problem-Special cases in LP

UNIT II **[12 Hours]**

Linear Programming: Simplex method-Introduction-standard form of an LP problem-simplex algorithm (maximization case) - simplex algorithm (minimization case)-some complications and their resolution-types of LP solutions

UNIT III **[12 Hours]**

Duality in LP: Introduction- Formulation of Dual LP Problem

Assignment Problem: Introduction-Mathematical model of AP-Solution Methods of AP-Variations of the AP-Travelling Salesman Problem

UNIT IV **[12 Hours]**

Transportation Problem: Introduction-Mathematical model of TP-Transportation Algorithm-Methods of Finding Initial Solution-Test for Optimality-Variations in TP-Maximization TP--Unbalanced TP

UNIT V **[12 Hours]**

Project Management: PERT and CPM: Introduction-Basic Difference Between PERT and CPM-Phases of Project Management-Pert/CPM Network Components and Precedence Relationships-Critical Path Analysis-Project Scheduling with Uncertain Activity Times-Project Time-Cost Trade-Off-Resource Allocation

Text Book

1. J K Sharma, **Operations Research Theory and Applications**, Fifth Edition, MacMillan Publishers India Ltd, New Delhi,2013

References

2. Kanti Swarup , P.K. Gupta and Man Mohan, **Operations Research,** Sultan Chand & Sons publishers, 13th Edition, 2004
3. V.K.Kapoor, **Operations Research**, Sultan Chand & Sons Publishers, New Delhi,4th Edition, 2001
4. Hamdy A.Taha, **Operations Research**, Prentice Hall of India Pvt Ltd, New Delhi,7th edition, 2005

CORE XV - COMPUTER NETWORKS

(For those who joined since 2018-19)

Semester : III **Hours/week: 4**
Code : GMCAC33 **Credit : 4**

Course Outcomes:

CO 1: Understand the basic concept of computer networks, models, types of transmission and transmission media
CO 2: Know the error detecting, correction, types of Ethernet and various types of networks
CO 3: Acquire knowledge about various types of protocols
CO 4: Get the internet concept, types of cryptography techniques and safe guard the internet

UNIT I **[12 Hours]**

Introduction: Data Communications - Networks - The Internet. **Network Models:** Layers in the OSI model - TCP/IP protocol suite - Addressing. **Physical Layer: Transmission media:** Guided Media - Unguided Media. **Telephone and cable networks for data transmission:** Telephone Network.

UNIT II **[12 Hours]**

Data Link Layer: Error Detection and Correction: Introduction - Block coding - Linear block codes - Cyclic codes - Checksum. **Data link Control:** Framing - Flow and error control - Noiseless channels - Noisy channels- Point to point protocol. **Multiple Access:** Random Access - Channelization. **Ethernet:** Standard Ethernet - Fast Ethernet - Gigabit Ethernet - Bluetooth - Connecting Devices - Backbone Networks - Wireless WANs - Cellular Telephony - Satellite Networks.

UNIT III **[12 Hours]**

Network Layer and Transport Layer: IPV4 - IPV6 - Address Mapping - ICMP - IGMP - Delivery - Forwarding - Unicast routing protocols - Multicast Routing Protocols - Transport layer - Process to process delivery - User datagram protocol - TCP - Congestion control - Quality of Service

UNIT IV **[12 Hours]**

Application Layer: Domain Name System: - Name space - Domain Name Space - Distribution of name space - DNS in the Internet - Remote logging Telnet - Email - File Transfer - WWW and HTTP - Architecture - Web documents - HTTP - Multimedia - Digitizing audio and video - Audio and video compression.

UNIT V **[12 Hours]**

Security: Cryptography - Symmetric key cryptography - Asymmetric key cryptography - Network security - Security services - Message confidentiality - Message integrity - Message authentication - Digital signature -Entity authentication - Security in the internet - PGP - Firewalls.

Text Book

1. Behrouz A Forouzan, **Data Communications And Networking**, Tata McGraw Hill companies, New Delhi, Fourth Edition, 2006

References

70718688. Andrew S. Tannenbaum, **Computer Networks** , Pearson Education , New Delhi, Fourth Edition,2003

70718689. Douglas E. Comer, **Computer Networks and Internets**, Pearson Education , New Delhi, Fourth Edition, 2004

70718690. LL Peterson, BS Davie, **Computer Networks: A Systems Approach**, Fifth Edition, Morgan-Kauffman, 2011

70718691. W Stallings, **Cryptography and Network Security**, Principles and Practice Fifth Edition, Prentice-Hall, 2010

CORE XVI - JAVA LAB

(For those who joined since 2018-19)

Semester : III **Hours/week: 4**
Code : GMCAC34P **Credit : 3**

Course Outcomes:

CO1 : Create Java programs that solve simple Mathematical problems.

CO2 : Understand the concepts of String Manipulation, Linear Search and Binary Search.

CO3 : Apply OOPS concepts in Java programming like inheritance.

CO4 : Implement the multi-threaded programs and Exception handling and Use of GUI components.

Formula Substitution

1. Write a program to find the factorial and binomial coefficient
2. Write a program to do calculate mean, variance and standard deviation

Loops

3. Write a program to do number checking
4. Write a program to do number conversion
5. Write a program to do number generation(prime, perfect,etc)

Arrays

6. Write a program to arrange numbers and names in order
7. Write a program to do linear search and binary search
8. Write a program to perform matrix addition, subtraction, multiplication & transpose

Strings

9. Write a program to perform string manipulation (case conversion, reversing, etc)

Inheritance

10. Write a program to illustrate inheritance

Exception Handling

11. Write a program to illustrate exception handling.

GUI

12. Write a program to demonstrate GUI components

Applets

13. Write an applet to handle keyboard events
14. Write an applet to handle mouse events
15. Write an applet to simulate a calculator (arithmetic operations)
16. Write an applet to display an image file
17. Write an applet to draw a picture
18. Write an applet for free hand drawing
19. Write an applet to illustrate multithreading
20. Write an applet to illustrate menus

Note: - Questions for the external examination will be based on the concepts learnt

CORE XVII - LINUX AND MULTIMEDIA LAB

(For those who joined since 2018-19)

Semester : III **Hours/week: 4**
Code : GMCAC35P **Credit : 3**

Course Outcomes:

CO 1: Able to understand the basis of Linux shell scripting
CO 2: Gain knowledge about own shell scripts writing
CO 3: Learn about how to animate objects
CO 4: Knowledge about create own animation objects

LINUX SHELL PROGRAMS

Control Statements

1. Write a shell program to find odd or even number
2. Write a shell program to find largest among three numbers
3. Write a shell program to find the factorial value

Switch

4. Write a shell program to perform arithmetic operations using case

Commands

5. Write a shell program to use who commands
6. Write a shell program to use list commands
7. Write a shell program to use sort commands
8. Write a shell program to use wc commands
9. Write a shell program to use split and cat commands
10. Write a shell program to use the GREP commands
11. Write a shell program to use SED commands

FLASH

Key frame

70719120. Animate a bud blossoming into Flower
70719121. Animation of seed growing into Plant
70719122. Draw a Natural scenery with animation
70719123. Animation of a Ball bouncing
70719124. Picture of melting candle using animation
70719125. Animate a Clock

Motion Tween

70719126. Animation of Solar system
70719127. Movement of Fishes in a tank using animation

Masking

70719128. Animate the picture using mask tool

Symbol and Motion Tween

70719129. Animate a Vehicle in the Road
70719130. Animate a Bird in Sky

Note :- Questions for the external examination will be based on the concepts learnt

ELECTIVE III (A) - COMPILER DESIGN

(For those who joined since 2018-19**)**

Semester : III **Hours/week: 4**
Code : FMCAE21A / GMCAE3A **Credit : 4**

Course Outcomes:

CO 1: Able to understand the fundamental principles in compiler design
CO 2: Know the lexical analysis and basic for parsing technique
CO 3: Acquire skills for building compilers
CO 4: Understand the concept of error detection, recovery and optimization

UNIT I **[12 Hours]**

Introduction to compilers: Compilers and translators – the need for translators - The structure of a compiler - Lexical analysis - Syntax analysis - Intermediate code generation – Optimization - Code generation – Bookkeeping - Error handling – Compiler - Writing tools.

UNIT II **[12 Hours]**

Lexical analysis: The role of the Lexical analyzer - A simple approach to the design of lexical analyzers - Regular expression-Finite Automata - Implementation of a lexical analyzer.
Basic Parsing techniques: Parsers - Shift- reduce parsing - Operator-precedence parsing - Top-down parsing - Predictive parsers.

UNIT III **[12 Hours]**

Automatic construction of efficient parsers: LR parsers - The canonical collection of LR(0) items – Constructing SLR parsing tables – Constructing canonical LR parsing tables – Constructing LALR parsing tables – Using ambiguous grammars – An automatic parser generator – Implementation of LR parsing tables – Constructing LALR sets of items.

UNIT IV **[12 Hours]**

Syntax-Directed Translation: Syntax-directed translation schemes - Implementation of syntax-directed translators - Intermediate code - Postfix notation – Parse trees and syntax trees -Three-address code, quadruples and triples – Postfix translations.
Symbol tables: The contents of symbol table – Data structures for symbol tables – Representing scope information.

UNIT V **[12 Hours]**

Error detection and recovery: Errors - Lexical–phase errors – Syntactic-phase errors – Semantic errors.
Introduction to code optimization: The principal sources of optimization – Loop optimization – The DAG Representation of basic blocks.
Code generation: Object programs – Problems in code generation – A simple code generator – Peephole optimization.

Text Book

1. Alfred V. Aho & Jeffrey D. Ullman, **Principles of Compiler Design**, Narosa Publishing House, New Delhi,Twenty fifth reprint, 2002

References

2. Dick Grune,Henri E Bal,Ceriel J H Jacobs,Koen G Langendoen,**Modern Compiler Design**,Wiley India P Ltd,New Delhi,2012
3. Dr. Kakde O G,**Comprehensive Compiler Design**,Laxmi Publications P Ltd,New Delhi,2005

ELECTIVE III (B) - MOBILE APPLICATION DEVELOPMENT

(For those who joined since 2018-19)

Semester : III **Hours/week : 5**
Code : FMCAE31D / GMCAE3B **Credit : 4**

Course Outcomes:

CO1: Acquire knowledge about Mobile Application Medium Types
CO2: Differentiate Mobile Web Applications and Native Application
CO3: Get an Idea about Tools for Mobile Design
CO4: Get an Idea about Testing for Device,Desktop and Usability

UNIT I **[15 Hours]**

A Brief History of Mobile: In the Beginning -The Evolution of Devices. **The Mobile Ecosystem:**Operators -Networks -Devices -Platforms - Operating Systems -Application Frameworks. **The need for Mobile** : Size and Scope of the Mobile Market- The Addressable Mobile Market- Mobile As a Medium.

UNIT II **[15 Hours]**

Designing for Context: Thinking in Context -Taking the Next Steps . **Developing a Mobile Strategy:** New Rules . **Types of Mobile Applications** :Mobile Application Medium Types.

UNIT III **[15 Hours]**

Mobile Information Architecture : Information Architecture-Mobile Information Architecture -The Design Myth .**Mobile Design** : Interpreting Design-The Mobile Design Tent-Pole-Designing for the Best Possible Experience-The Elements of Mobile Design -Mobile Design Tools -Designing for the Right Device -Designing for Different Screen Sizes. **Mobile Web Apps Versus Native Applications** :The Ubiquity Principle - When to Make a Native Application - When to Make a Mobile Web Application.

UNIT IV **[15 Hours]**

Mobile 2.0 : Introduction to Mobile 2.0 -Mobile 2.0.**Mobile Web Development:**Web Standards - Designing for Multiple Mobile Browsers –Device Plans -Markup - CSS: Cascading Style Sheets-JavaScript.**iPhone Web Apps:** The need for WebKit- Mobile Web App- Markup- CSS- JavaScript-Creating a Mobile Web App- Web Apps As Native Apps -PhoneGap -Tools and Libraries.

UNIT V **[15 Hours]**

Adapting to Devices: Adaptation is a "Necessity"- Strategy #1: Do Nothing- Strategy #2: Progressive Enhancement- Strategy #3: Device Targeting- Strategy #4: Full Adaptation- Domain to Use

Making Money in Mobile: Working with Operators- Working with an App Store- Add Advertising- Invent a New Model.**Supporting Devices** :Having a Device Plan- Device Testing- Desktop Testing- Usability Testing.

Text Book

1. Brain Fling, **Mobile Design and Development**, O'Reilly Media,USA, First Edition,2009.

References

2. James Pearce, **Professional Mobile Web Development With Wordpress, Joomla, And Drupal ,** Wiley India Pvt Ltd,New Delhi, First Edition ,2011
3. Adrian Kosmaczewski , **Mobile Java Script Application Development**, O'Reilly Media ,USA,First Edition, 2012.

ELECTIVE IV (A) - FINANCIAL COST AND MANAGEMENT ACCOUNTING

(For those who joined since 2018-19)

Semester : III **Hours/week: 5**
Code : GMCAE3C **Credit : 4**

Refer Syllabus by the Board of Studies of the Department of Commerce

ELECTIVE IV (B) - SOFT COMPUTING

(For those who joined since 2018-19)

Semester : III **Hours/week: 5**
Code : FMCAE32D / GMCAE3D **Credit : 4**

Course Outcomes:

CO1 : Comprehend the Introduction and different architectures & Applications of neural network
CO2 : Understand the concepts of Fuzzy Logic Controller & applications of Fuzzy logic
CO3 : Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems
CO4 : Apply genetic algorithms to combinatorial optimization problems

UNIT I **[12 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 Back Propagation Network-The Perceptron Model-Single Layer Artificial Neural Network-Model of a Multilayer Perceptron-Back Propagation Learning-Applications-Selection of Various Parameters in BPN-Variations of Standard Back Propagation Algorithm

UNIT II **[12 Hours]**

Associative Memory-Auto Correlators-Hetero Correlators:Koskos Discrete BAM- Wang et al's Multiple Training Encoding Strategy-Exponential BAM-Associative Memory for Real Coded Pattern Pairs-Applications- Adaptive Resonance Theory-Introduction- ART1 –ART2-Applications.

UNIT III **[12 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 System-Defuzzification Methods-Applications.

UNIT IV **[12 Hours]**

Fundamentals of Genetic Algorithms-Genetic Algorithms-History-Basic Concepts-Creation of Offsprings-Working Principle-Encoding-Fitness Function-Reproduction-Inheritance Operators-Cross Over-Inversion

and Deletion-Mutation Operator-Bitwise Operators-Bitwise Operators Used in GA-Generational Cycle-Convergence of Genetic Algorithm-Applications.

UNIT V **[12 Hours]**

Integration of Neural Networks-Fuzzy Logic and Genetic Algorithms-Hybrid Systems-Neural Networks, Fuzzy Logic and Genetic Algorithms Hybrids-Genetic Algorithm Based Back Propagation Networks-GA Based Weight Determination-Applications-Fuzzy Back Propagation Networks

Text Book

1. S Rajasekaran and G A Vijayalakshmi, **Neural Networks, Fuzzy Logic And Genetic Algorithms-Synthesis And Applications**, Prentice Hall of India,New Delhi,2007

References

2. Satish Kumar, **Neural Networks – A Class Room Approach**, Tata McGraw Hill Publishing Company Limited,New Delhi, 2007
3. James A Freeman and David M Skapura, **Neural Netwoks Algorithms,Applications And Programming,** Pearson Education,New Delhi,2004
4. George J Klir, Tina A Folger**, Fuzzy Sets, Uncertainty And Information**, Prentice Hall of India private limited, New Delhi, 2006

CORE XVIII- ADVANCED JAVA

(For those who joined since 2018-19)

Semester : IV **Hours/week : 4**
Code : FMCAC411 / GMCAC41 **Credit : 4**

Course Outcomes:

CO1: Differentiate Swing and Applet Coding
CO2: Acquire Knowledge about Java Beans
CO3: Get Knowledge about Database Connectivity
CO4: Understand RMI and Servlet Programming

UNIT I **[12 Hours]**

JSP- JEEE- JSF- J2ME- Struts .**Networking with Java :** Basics of Networking- Sockets in Java-Client-Server in Networking - Proxy Servers - Internet Addressing - Domain Naming Service(DNS) -Inet4 Addresses and Inet6 Addresses- The URL Class- The URI Class- TCP/IP and Datagram - Java Net APIs – InetAddresses - InetAdress Caching- Creating and Using Sockets- Creating TCP Clients and Servers- A Whois Example- Submitting an HTML Form from Java- Handling URL- Using URLConnection Objects-Working With Datagrams- Datagram Server and Client.

Swing: The Java Foundation Classes- Swing- Heavyweight vs. Lightweight Components- Swing Features-Graphics Programming Using Panes- Model View Controller Architecture- Working With Swing-Preparing to Create a Swing Applet- Understanding Root Panes, Layered Pane and Content Panes-Creating a Swing Applet and Application – Closing JFrame Windows –Selecting Component Borders.

UNIT II **[12 Hours]**

Swing: Labels and Text Fields – Buttons – Toggle Buttons – Check Boxes and Radio Buttons – Using Labels, Image Icons, Images in Labels, Text Fields – Setting Text Field Alignment- Creating Password Field, Text Areas, Editor Panes, Text Panes- Using HTML and RTF files in Editor Panes- Setting Text Pane Text Attributes- Working with Sound in Applets and Application – Using Buttons, Check Boxes, Radio Buttons.

Swing: Combo Boxes, Progress Bars - Creating Combo Boxes- Handling Combo Boxes Selection Events-Creating Editable Combo Boxes - Adding Images to Combo Boxes -Creating a Combo Box Model-Creating a Combo Box Custom Renderer- Creating Progress Bars- Updating Progress Bars- Handling Progress Bar Events.

UNIT III **[12 Hours]**

Swing: Menus and Toolbars - Creating a Menu Bar- Creating a Menu- Creating a Menu Item - Creating a Basic Menu System - Adding Images to Menu- Creating Check Box Menu Items - Creating Radio Button Menus- Creating Sub Menus, Pop- Up menus - Creating Toolbars- Adding Combo Boxes and Other Controls to Tool Bars.

Working with Java Beans: Introduction – Introspection – Customizers - Understanding Java Beans- Designing programs Using Java Beans - Creating Applets that Use Java Beans- Creating a Java Bean- Creating a Bean Manifiest File and JAR File- Using a New Bean- Adding Controls to Beans - Giving a Bean Properties- Design Patterns for Properties- Simple Properties- Design Patterns for Events- Methods and Design Patterns- Creating Bound Properties- Giving a Bean Methods- Giving a Bean an Icon- Creating a BeanInfo class- Persistence- The Java Beans API.

UNIT IV **[12 Hours]**

Talking to Database: JDBC- JDBC Versus ODBC and Other APIs- Two- Tier and Three- Tier Models- Introducing SQL- The JDBC Package - Types of JDBC Drivers- Javasoft Framework-Driver Interface and Driver Manager Class - The Essential JDBC Program- Using a Prepared Statement Object- The Interactive SQL Tool- Using Tables- Defining a Table Model.

JDBC in Action: Data Types and JDBC – Scrollable Result Sets - Batch Updates - Mapping Relational Data into Java Objects - Basic JDBC Types- Advanced JDBC data types.

UNIT V **[12Hours] Understanding RMI**:

Remote Method Invocation (RMI) - Client/Server Architecture- Implementing RMI - Limitation of RMI, A Model RMI Transaction -Writing an RMI Server- Designing a Remote Interface- Implementing a Remote Interface- Passing Object in RMI- Implementing the Server's Main Method- Creating a Client Program- Compiling and Running the Example – Exporting with Unicast Remote Object – Exporting Activatable Objects.

Understanding Servlet Programming: Servlet2.4- Overview of Servlets- Servlet API- Servlet and Environment State- Servlet Lifecycle- Security Features- HTML Aware Servlet - HTTP Specific Servlets - Performance Features- Three Tier Applications- Web Publishing System- Package javax..Servlet Description-Servlet Configuration- How the Application works.

Text Book:

1. Steven Holzner et al , **Java 2(JDK 5 Edition) Programming Black Book** , Dreamtech press, New Delhi, 2006.

References:

70719552. James Gosling, David Holmes, Ken Arnold, **The Java Programming Language**, Addison-Wesley Professional, 4th edition, 2005.

70719984. Dr. Rajkumar Buyya, Dr. S. Thamarai Selvi, Mr. Xingchen Chu, **Object Oriented Programming with Java: Essentials and Applications**, Tata McGraw Hill publishing company Ltd, 2009.

70720416. Troy Bryan Downing, **Java RMI Remote Method Invocation** , IDG Books India,2000.

70720417. Ivan Bayross, **Web enabled Commercial Application Development using Java 2.0**, BPB Publications, 2000.

70720848. Laurence Vanheusuve, **Mastering Java Beans**, BPB Publications, New Delhi,1997.

70720849. James Goodwill, **Developing Java Servlets**, Techmedia, New Delhi, 2000.

CORE XIX - SOFTWARE ENGINEERING

(For those who joined since 2018-19)

Semester : IV **Hours/week: 4**

Code : FMCAC421 / GMCAC42 **Credit : 4**

Course Outcomes:

CO 1 : Classify the varieties of software and models for software development

CO 2 : Know how to gather requirements and design a software

CO 3 : Implement testing strategies to test the software for errors and omissions

CO 4 : Manage the risks and ensure quality of the software developed

UNIT I [**12 Hours]**

Introduction: Software – the changing nature of software – software engineering : a layered technology – a process framework – process models : prescriptive models – the waterfall model – incremental process models – evolutionary process models – specialized process models

Software Engineering practice: communication practices - planning practices – modeling practices – construction practice – deployment

UNIT II [**12 Hours]**

Requirements Engineering: A bridge to design and construction – requirements engineering tasks – initiating the requirements engineering process – eliciting requirements – developing use-cases – building the analysis model – negotiating requirements – validating requirements

Design Engineering: Design within the context of software engineering – design process and design quality – design concepts – the design model –pattern-based s/w design

UNIT III [**12 Hours]**

Testing Strategies: A strategic approach to software testing – strategic issues – test strategies for conventional software – test strategies for object- oriented software – validation testing – system testing – the art of debugging

Testing Tactics: software testing fundamentals – black-box and white-box testing – white-box testing – basis path testing – control structure testing – black-box testing – object-oriented testing methods – testing for specialized environments – testing patterns

UNIT IV [**12 Hours]**

Project Management: the management spectrum – the people – the product – the process – the project

Risk Management: reactive Vs proactive risk strategies – software risks- risk identification – risk projection –risk refinement – risk mitigation, monitoring and management – the RMMM plan

UNIT V [**12 Hours]**

Quality Management: Quality concepts – software quality assurance – s/w reviews – formal technical reviews – statistical software quality assurance – s/w reliability – The ISO 9000 quality standards – the SQA plan

Change Management: software configuration management – the SCM repository – the SCM process

Text Book

1. Roger S. Pressman, **Software Engineering A Practitioner's Approach**, Tata McGraw Hill International edition,New Delhi,Sixth Edition 2005

References

2. Ian Sommerville, **Software Engineering**, Pearson Education ,New Delhi,7th edition, 2004
3. Samarjeet kaur , Sandhir Sharma & P.P Singh, **Software Engineering – Complete Course Book**, Deep & Deep Publications Pvt. Ltd., New Delhi , 2006
4. Waman S Jawadekar, **Software Engineering – Principles and Practice**, Tata McGraw Hill Education Private Limited, New Delhi ,2004

CORE XX - OPEN TECHNOLOGIES

(For those who joined since 2018-19**)**

Semester : IV **Hours/week: 4**

Code : FMCAC231 / GMCAC43 **Credit : 4**

Course Outcomes:

CO 1: Able to know the basic concepts of free software and new generation of web framework – Django

CO 2: Deploy the Django application and understand the concept of static and dynamic pages

CO 3: Know the knowledge of server side web application framework: Ruby on Rails (Rails)

CO 4: Able to fill the custom style sheet

UNIT I **[12 Hours]**

Introduction: The concept of software freedom-motivations-consequences of the freedom of software.
A bit of History:Free software before free software-beginning BSD,GNU-everything in its way.Legal aspects:Brief introduction to intellectual property-free software licenses.
Case studies:Linux-Mozilla-Red Hat Linux.

UNIT II **[12 Hours]**

PYTHON: Introduction to Django-templates-models-forms

UNIT III **[12 Hours]**

PYTHON: Deploying Django-caching-integrating with legacy databases and applications-security

UNIT IV **[12 Hours]**

RUBY: Introduction-Up and running-deploying a demoapp-static and dynamic pages

UNIT V **[12 Hours]**

RUBY:Rails –flavored Ruby-filling in the layout-modeling users

Text Books

1. Jesus M Gonzalez-Barahona,Joaquin Seoane Pascual,Gregories Robles , **Introduction To Free Software,**Free Technology Academy,2009
2. Adrian Holovaty,Jacob Kaplan-Moss,**The Definitive Guide To Django:Web Development Done Right,** Apress,New York,2009
3. Michael Hartl, **Ruby On Rails Tutorial:Learn Web Development With Rails**, Addison – wesley Professional Ruby series,Bostan,2012

References

4. David Beazley,Brian K Jones**, Python Cookbook**, O'Reilly Media,2013
5. David Thomas, Andrew Hunt, **Programming Ruby: The Pragmatic Programmer's Guide,** Addison Wesley , Bostan,2000

CORE XXI – INFORMATION SECURITY

(For those who joined since 2018-19)

Semester : IV **Hours/week: 4**
Code : FMCAC441 / GMCAC44 **Credit : 4**

Course Outcomes:

CO 1 : Understand the importance of Information security and the career opportunities
CO 2 : Know the various principles of information security
CO 3 : Describe the common body of knowledge and it's domains
CO 4 : Know the basics of Cryptography

UNIT I **[12 Hours]**

Introduction-Growing IT security importance and new career Opportunities-Becoming an information Security specialist
Information Security Principles of Success: Introduction - Principle 1: There is no such thing as absolute security- Principle 2: The three security goals are confidentiality, integrity and availability- Principle 3: Defense in Depth as strategy- Principle 4: When left on their own,people tend to make the worst security decisions.Principle 5: Computer Security Depends on two types of requirements-Principle 6: security through obscurity is not an answer.Principle 7:Security -Risk Management - Principle 8: The Three Types of Security Controls Are Preventative,Detective,and Responsive .Principle 9:Complexity is the enemy of security.Principle 10:Fear,uncertainly,and doubt do not work in selling security.Principle

11:People,process,and technology are all needed to adequately secure a system or facility. Principle 12: Open disclosure of vulnerabilities is good for security.

UNIT II **[12 Hours]**

Certification Programs and the Common Body of Knowledge: Introduction –The Information Security Common Body of Knowledge – Other Certificate Programs in the IT Security Industry.**Security Management:**Introduction – Security Policies Set the Stage for Success – Four Types of Policies – Development and Management of Security Policies – Policies Support Documents – Suggested Standards Taxonomy –Responsible for Security

UNIT III **[12 Hours]**

Security Architecture and Models: Introduction – Defining the Trusted Computing Base- Protection Mechanisms in a Trusted Computing Base – System Security Assurance Concepts - Trusted Computer Security Evaluation Criteria – Information Technology Security Evaluation Criteria

Law, Investigations,and Ethics: Introduction-Types of computer crime-How cyber criminals commit crimes-The computer and the law-Intellectual property law-Privacy and the law-computer forensics-The information security professional's code of ethics other ethics standards.

UNIT IV **[12 Hours]**

Physical Security Control: Introduction – Understanding the Physical Security Domain - Physical Security Threats – Providing Physical Security- **Operations Security:**Introduction – Operations Security Principles - Operations Security -Process Controls - Operations Security Process Controls in Action-**Cryptography:**Introduction – Applying Cryptography to Information Systems – Basis Terms and Concepts – Strength of Cryptosystems – Putting the Pieces to Work – Examining Digital Cryptography

UNIT V **[12 Hours]**

Telecommunications, Network, and Internet Security: Introduction – Network Security Context – The Open Systems Interconnection (OSI) Reference Model – Data Network Types – Protection TCP/IP Networks – Basic Security Infrastructures – Firewalls– Virtual Private Networks-**Application Development Security:**The Practice of Software Engineering – Software Development Life Cycles – Distributed Systems – Malware – Antivirus Software – Improving Security across the SDLC-**Security the Future:**Introduction – Continuous Monitoring and Constant Vigilance – Operation Eligible Receiver – Identity Theft and U.S. Regulatory Environment – Growing Threats- Trends in Security Threats

Text Book

1. Mark Merkow , Jim Breithaupt ,**Information Security**,Pearson edition,New Delhi,2013

References

70721280. Ankur shree aggarwal, Anuradha Tyagi, Shaul Goel, Sanjeev Kumar Sharma, **Information Security And Cyber Law***s*, Vayu Education of india, New Delhi,2011

70721281. Michael E.whitman, Herbert J.Mattord, **Principles And Practices of Information Security**, Cengage Learning India Private Limited, New Delhi,2012

CORE XXII - ADVANCED JAVA LAB

(For those who joined since 2018-19)

Semester : IV **Hours/week: 4**
Code : GMCAC45P **Credit : 3**

Course Outcomes:

CO 1: Understand Java network package
CO 2: Differentiate AWT and Swing controls
CO 3: Acquire Knowledge about Java Beans and Database Connectivity
CO 4: Understand RMI and Servlet Programming

Networking

1. Do one and two way communication(s)

Swing

76779712. Display current date & time in different format.
76779713. Set a foreground and background color for label
76779714. Create simple calculator

Bean

76780144. Create button
76780145. Create text box which accepts only characters
76780146. Create text box which accepts only integer value

JDBC

76780624. Prepare a mark list containing Name, Reg no, Marks for Maths, Physics and Chemistry for 5 students are given. A student will be declared as "PASS" when the marks of maths, physics and chemistry are 40 or more otherwise as "FAIL"
76781056. Maintain a telephone directory in a database and use it to find the address of a person. This system should contain two options, one to add new numbers and another to find the address of a person, if the phone number is given. Each record in the telephone directory contains the following details: Name, Phone number and Address
76781488. Prepare a payroll system for a company

RMI

78465232. Display a string message
78465233. Perform arithmetic operations
78465234. Find factorial
78465235. Generate Fibonacci series
78465760. Calculate income tax

Servlet

78466768. Display simple message
78466769. Demonstrate how many times the user has accessed the same Servlet
78466770. Generate random numbers
78466771. Prepare a mark list containing Name, Reg no, Marks for Maths, Physics and Chemistry for 5 students are given. A student will be declared as "PASS" when the marks of maths, physics and chemistry are 40 or more otherwise as "FAIL". Display list of students who are failed in different subject
78466772. Prepare a payroll system for a company. Display employee details who are paying income tax and working more than ten years

Note:- Questions for the external examination will be based on the concepts learnt

CORE XXIII - OPEN TECHNOLOGIES LAB

(For those who joined since 2018-19**)**

Semester : IV **Hours/week: 4**
Code : GMCAC46P **Credit : 3**

Course Outcomes:

CO 1: Demonstrate control structures and date functions in python
CO 2: Implement Operator Overloading in Python
CO 3: Create blog using templates
CO 4: Create blog using Rail

PYTHON

Simple Commands

1. Display the message
2. Convert decimal number into binary number
3. Display fibonacci sequence using recursion
4. Count the number of each vowel
5. Implement the Arithmetic Quiz

70733520. Convert a date read from the user, given in DD/MM/YYYY format into written format. For example, Enter a date in DD/MM/YYYY Format: 16/7/2003 Output: 16 July, 2003
70733521. Print the contents of a file in uppercase using function
70733522. Sort the contents of a file using function

OOPs Concept

76632400. Implement Operator Overloading

Web Development

76632928. Create a button with the text, "Hello World".

76632929. Write a python script that creates a combo box with three elements. When the selection is changed the selected item is to be printed.

76632930. Create a simple application window with menus and submenus

76632931. Create a simple application window with displaying lines

76632932. Create a web site for displaying message

76632933. Create a simple blog using models

76632934. Create a simple blog using templates

76632935. Create a web page for a web magazine

RUBY ON RAIL

76738992. Display a message "Helloworld"

76738993. Create a simple blog

76738994. Send mail to anybody

Note:-Questions for Internal and External examination will be based on concept learnt

ELECTIVE V (A) - DIGITAL IMAGE PROCESSING

(For those who joined since 2018-19)

Semester : IV **Hours/week: 4**

Code : FMCAE41A / GMCAE4A **Credit : 4**

Course Outcomes:

CO1: Know the Fundamental Steps and Basic Components of Image Processing

CO2: Understand Various Filtering Methods, Smoothing and Sharpening to enhance image

CO3: Know Various Color Models and Color Image Processing Methods

CO4: Types of Morphological processing

UNIT I **[12 Hours]**

Digital Image Processing: fields that use digital image processing – fundamental steps – components of an image processing system – elements of visual perception – light and the electromagnetic spectrum – image sensing and acquisition – sampling and quantization – basic relationships between pixels – linear and nonlinear operations.

UNIT II **[12 Hours]**

Image Enhancement: Basic gray level transformations- histogram processing - enhancement using arithmetic / logic operations -spatial filtering - smoothing spatial filters - sharpening spatial filters - combination - Fourier transformation and frequency domain -smoothing frequency - domain filters - sharpening frequency domain filters - Homomorphic filters.

UNIT III **[12 Hours]**

Image Restoration: Noise models – restoration in the presence of noise only – spatial filtering – periodic noise reduction by frequency domain filtering, linear position – invariant degradations – estimating the degradation function – inverse filtering – minimum mean square error filtering – constrained least square filtering – geometric mean filter - geometric transformation. **Color Image Processing**: Color fundamentals – color models – pseudo color image processing – full color image processing – color transformations – smoothing and sharpening – color segmentation – noise in color images – color image compression.

UNIT IV **[12 Hours]**

Wavelets and Multiresolution Processing: Background – Multiresolution expansions – wavelet transformation in one dimension - the fast wavelet transform - wavelet transformation in two dimensions –

wavelet packets.**Image Compression:** Fundamentals - image compression models – elements of information theory – error free compression - lossy compression – Image compression standards.

UNIT V **[12 Hours]**

Morphological Image Processing: Preliminaries - dilation and erosion - opening and closing -the hit-or-miss transformation -basic morphological algorithms - extensions to gray-scale images.**Image Segmentation:** Detection of discontinuities - edge linking and boundary detection – thresholding- region-based segmentation- segmentation by morphological watersheds - the use of motion in segmentation.

Text Book

1. Rafael C. Gonzalez and Richard E. Woods, **Digital Image Processing**, Pearson Education Pte. Ltd,New Delhi, second edition, 2007.

References

2. Anil K Jain, **Fundamental of Digital Image Processing**, Prentice Hall of India Pvt Ltd, New Delhi,2007
3. Wilhelm Burger,Mark J.Burge,**Digital Image Processing An Algorithmic Introduction in Java**,Springer,London,II Edition,2016

ELECTIVE V (B) - CLOUD COMPUTING

(For those who joined since 2018-19)

Semester : IV **Hours/week : 4**
Code : GMCAE4B **Credit : 4**

Course Outcomes:

CO1 : Compare the strengths and limitations of cloud computing
CO2 : Identify the architecture, infrastructure and delivery models of cloud computing
CO3 : Apply suitable virtualization concept
CO4: Analyse various cloud programming models and apply them to solve problems on the cloud

UNIT I **[12 Hours]**

Introduction to Cloud Computing: Cloud Computing in a Nutshell - Roots of Cloud Computing - Layers and Types of Clouds - Desired Features of a Cloud - Cloud Infrastructure Management - Infrastructure as a Service Providers - Platform as a Service Providers.

Migrating into a Cloud: Introduction - Broad Approaches to Migrating into the Cloud - The Seven-Step Model of Migration into a Cloud.

UNIT II **[12 Hours]**

Enriching the 'Integration as a Service' Paradigm for the Cloud Era: An Introduction - The Evolution of SaaS - The Challenges of SaaS Paradigm- Approaching the SaaS Integration Enigma - The Integration Methodologies - SaaS Integration Products and Platforms - SaaS Integration Services - SaaS Integration Appliances.

The Enterprise Cloud Computing Paradigm: Introduction - Issues for Enterprise Applications on the Cloud - Enterprise Cloud Technology and Market Evolution - Business Drivers toward a Marketplace for Enterprise Cloud Computing - The Cloud Supply Chain.

UNIT III **[12 Hours]**

Virtual Machines Provisioning and Migration Services: Introduction and Inspiration - Virtual Machines Provisioning and Manageability - Virtual Machine Migration Services - VM Provisioning and Migration in Action - Provisioning in the Cloud Context.

On the Management of Virtual Machines for Cloud Infrastructures: The Anatomy of Cloud Infrastructures - Distributed Management of Virtual Infrastructures – Scheduling Techniques for Advance Reservation of Capacity - Capacity Management to meet SLA Commitments

UNIT IV **[12 Hours]**

Aneka—Integration of Private and Public Clouds: Introduction - Technologies and Tools for Cloud Computing - Aneka Cloud Platform - Aneka Resource Provisioning Service - Hybrid Cloud Implementation.

Comet Cloud: An Autonomic Cloud Engine: Introduction – Comet Cloud Architecture - Autonomic Behaviour of Comet Cloud - Overview of Comet Cloud-based Applications.

UNIT V **[12 Hours]**

Workflow Engine for Clouds: Introduction - Background - Workflow Management Systems and Clouds - Architecture of Workflow Management Systems - Utilizing Clouds for Workflow Execution.

The Map Reduce Programming Model and Implementations: Introduction - MapReduce Programming Model - Major Map Reduce Implementations for the Cloud - MapReduce Impacts and Research Directions.

Text Book:

2 Rajkumar Buyya, James Broberg, Andrzej M.Goscinski, **"Cloud Computing : Principles And Paradigms"**, Wiley, First Edition, 2011.

References:

2 Nikos Antonopoulos, Lee Gillam, **"Cloud Computing: Principles, Systems and Applications"**, Springer, Second Edition, 2012.

2 Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, "**Mastering Cloud Computing",** Tata McGrawHill, First Edition, 2013.

2 Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, "**Cloud Computing Concepts, Technology & Architecture"**, Prentice Hall, First Edition, 2013.

CORE XXIV - DATA MINING AND WAREHOUSING

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Code : FMCAC511 / GMCAC51 **Credit : 4**

Course Outcomes:

CO1: Get knowledge about Data Preprocessing Steps

CO2: Acquire knowledge about types of classification methods in Data Mining

CO3: Analyse types of Data clusters and methods

CO4: Learn types of Data Mining

UNIT I **[12 Hours]**

Data Mining: Data Mining Functionalities-Classification of Data Mining Systems- Data Mining Task Primitives-Integration of a Data Mining System with a Database or Data Warehouse System-Major Issues in Data Mining.

Data Preprocessing: Data Cleaning-Data Integration and Transformation-Data Reduction – Discretization and Concept Hierarchy Generation.

UNIT II **[12 Hours]**

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse-A Multidimensional Data Model-Data Warehouse Architecture-Data Warehouse Implementation- From Data Warehousing to Data Mining.

Data Cube Computation and Data Generalization: Further Development of Data Cube and OLAP Technology-Attribute-Oriented Induction-An Alternative Method for Data Generalization and Concept Description-Mining various kinds of Association Rules.

UNIT III **[12 Hours]**

Classification and Prediction: Issues Regarding Classification and Prediction-Classification by Decision Tree Induction-Bayesian Classification-Classification by Back propagation–Associative Classification:Classification by Association Rule Analysis-Other Classification Methods-Prediction-Accuracy and Error Measures.

UNIT IV **[12 Hours]**

Cluster Analysis : Definition -Types of data in Cluster Analysis-A Categorization of Major Clustering Methods-Partitioning Methods-Hierarchical Methods-Density based Methods-Grid based Methods-Model based Clustering Methods-Clustering high dimensional data-Constraint based Cluster Analysis-Outlier Analysis.

UNIT V **[12 Hours]**

Mining Complex Types of Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects-Spatial Data Mining-Multimedia Data Mining-Text Mining -Mining the World Wide Web.

Applications and Trends in Data Mining: Data Mining Applications-Data Mining System Products and Research Prototypes-Additional Themes on Data Mining-Social Impacts of Data Mining-Trends in Data Mining.

Text Book

1. Jiawei Han and Micheline Kamber, **Data Mining : Concept and Technique**, Morgan Kaufmann Publishers,San Francisco, First Indian Reprint, 2006

References

70729920. Pieter Adriaans and Dolf Zantinge , **Data Mining** , Pearson Education,New Delhi, Ninth Indian Reprint 2003

70729921. Anand Rajaraman and Jeffrey David Ullman, **Mining of Massive Datasets**, Cambridge University,Press, 2012.

70729922. Pete Warden, **Big Data Glossary**, O'Reilly, 2011.

CORE XXV - WEB TECHNOLOGY

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Code : FMCAC521 / GMCAC52 **Credit : 4**

Course Outcomes:

CO1 : Develop a dynamic webpage by the use of java script and DHTML
CO2 : Create web pages using XHTML and Cascading Style Sheets
CO3 : Create XML documents and Schemas
CO4 : Acquire knowledge on Web Services such as SOAP, UDDI and WSDL

UNIT I **[12 Hours]**

Introduction to Computer and the Internet: Introduction, History of the Internet, Personal Computing, History of the World Wide Web, World Wide Web Consortium, Hardware Trends, Key Software Trend: Object Technology, JavaScript: Object-Based Scripting for the Web, Browser Portability, Microsoft .Net, Dynamic HTML, Internet and World Wide Web How to Program.

Adobe Photoshop Elements: Creating Web Graphics: Introduction, Image Basics, Vector and Raster Graphics, Toolbox, Layers, Screen Capture, File Formats.

Introduction to XHTML: Introduction, Editing XHTML, First XHTML Example, W3C XHTML Validation Service, Headers, Linking, Images, Special Characters and More Line Breaks, Unordered Lists, Nested and Ordered Lists.

UNIT II **[12 Hours]**

Java Script: Introduction to Scripting- Introduction, Simple Program, Obtaining User Input with Prompt Dialogs.

Java Script Functions: Introduction, Program Modules in JavaScript, Programmer-Defined Functions, Function Definitions, JavaScript Global Functions

Java Script Arrays : Introduction, Arrays, Declaring and Allocating Arrays, Examples Using Arrays, Passing Arrays to Functions, Multidimensional Arrays

Java Script Objects : Introduction, Math Object, String Object, Date Object, Boolean and Number Objects, document Object, Window Object, Using Cookies.

UNIT III **[12 Hours]**

Cascading Style Sheets: Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking External Style Sheets, W3C CSS Validation Service, Positioning Elements, Backgrounds, Element Dimensions, Text Flow and the Box Model, User Style Sheets.

Extensible Markup Language (XML) : Introduction, Structuring Data, XML Namespaces, Document Type Definitions and Schemas, XML vocabularies, Document Object Model, DOM Methods, Simple API for XML, Extensible Style sheet Language, Simple Object Access Protocol, Web Services, Water^{TM} XML-Based Programming Language.

UNIT IV **[12 Hours]**

Dynamic HTML Filters and Transitions : Introduction, Flip Filters, Transparence with the chroma Filter, Creating Image masks, Miscellaneous Image Filters, Adding Shadows to Text, Creating Gradients with alpha, Making Text glow, Creating Motion with blur, Using the wave Filter, Advanced Filters, blendTrans Transition, reveal Trans Transition.

Dynamic HTML Data Binding with Tabula Data Control : Introduction, Simple Data Binding , Moving within a Recordset, Binding to an image, Binding to a table, Sorting table data, Advanced sorting and Filtering, Data Binding Elements

UNIT V **[12 Hours]**

Introduction to Web Services: Overview of Web Services- Web Service Architecture- Component of Web Service-**Introduction to SOAP:** Defining SOAP- Architecture of SOAP- Processing of SOAP messages-**Introduction to UDDI:** Defining UDDI- Working with UDDI business directories- UDDI specifications- UDDI scenarios-**Introduction to WSDL:** Overview of WSDL.

Text Books

1. H.M. Deitel, P.J. Deitel and A.B. Goldberg, **Internet & World Wide Web –How To Program**, Prentice-Hall, Inc.Third Edition,2005

2. Geetanjali Arora, Sai Kishore, **XML Web Services Professional Projects –with NIIT**, Premier Press, 2002

References

70730400. Raj Kamal, **Internet And Web Technologies**, Tata McGraw Hill publishing company Ltd , New Delhi , 2002

70730401. Thomas A. Powell, **The Complete Reference Web Design**, Tata McGraw Hill publishing company Ltd , New Delhi , 2nd edition, 2002

CORE XXVI – SOFTWARE DEVELOPMENT FRAMEWORK

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Code : FMCAC531 / GMCAC53 **Credit : 4**

Course Outcomes:

CO1: Understand the basic concepts of .net and different languages
CO2: Differentiate the value and reference type
CO3: Acquire the knowledge of Page class and web controls
CO4: Design a web form with validation controls and know the data base concept with .Net

UNIT I **[12 Hours]**

The .NET Framework: . Net programming Framework-VB.NET,C#.NET and the .NET Languages-The Common Language Runtime-The .NET Class Library-ASP.NET-Visual Studio .NET.

Learning the .NET Languages:The .NET Languages-Data Types-Declaring Variables-Scope and Accessibility-Variable Operations-Object-Based Manipluation-Conditional Structures-Loop Structures-Functions and Subroutines.

Types ,Objects and Namesspaces: The Basics about classes –Value Types and Reference Types-Advanced Class Programming-Understanding Namespaces and Assemblies.

UNIT II **[12 Hours]**

ASP.NET APPLICATIONS: ASP.NET Applications-Code-Behind-The Global.asax Application File-Understanding ASP.NET Classes-ASP.NET Configuration. Web Form Fundamentals: A Simple Page Applet-A Deeper Look at HTML Control Classes-The Page Class-Accessing HTML Server Controls.

Web Controls: Stepping Up to Web Controls-Web control Classes-AutoPostBack and Web Control Events-A Simple Web Page Applet – Assessing Web Controls.

UNIT III **[12 Hours]**

Using Visual Studio .NET: The promise of Visual Studio.NET-Starting a Visual Studio.Net Project – The Web form Designer-Writing Code-Visual Studio.NET Debugging-Working Without Visual Studio.NET

Validation and Rich Controls: Validation-A simple Validation Example-Understanding Regular Expressions-A Validated Customer Form-Other Rich Controls.

State Management: The Problem of State-Viewstate-Transferring Information-CustomCookies-Session State-Configuration-Application State.

UNIT IV **[12 Hours]**

Tracing, Logging and Error Handling: Common Errors-The .NET Exception Object-Handling exceptions-Throwing Your Own Exceptions-Logging Exceptions-Error Pages-Page Tracing.

Overview of ADO.NET: Introducing ADO.NET and DataManagement-Characteristics of ADO.Net-The ADO.NET Object Model.

ADO.NET Data Access:About the ADO.NET Examples-SQL Basics-The SQL Select Statement-Update-Insert-Delete-Accessing Data the Easy Way-Creating a connection-Defining a Select Command-Using a Command with a DataReader-Updating Data-Accessing Disconnected Data-Selecting Multiple Tables-Modifying Disconnected Data-Updating Disconnected Data

UNIT V **[12 Hours]**

Data Binding: Introduction-Single-Value Data Binding-Repeated-Value Data Binding-Data Binding with Databases.

The DataList,DataGrid and Repeater: Introducing Templates-Using Templates with the DataList-Data Binding with Multiple Templates-Comparing the Template Controls-Selecting Items-Editing Items-Paging with the DataGrid-Sorting with the DataGrid

Using XML: XML's Hidden Role in .NET-XML Explained- The XMLClasses-XML Validation-XML Display and Transforms-XML in ADO.NET

Text Book

1. Matthew MacDonald, **The Complete Reference ASP.NET**, Tata McGraw-Hill Publishing Company Ltd,2002.

References

2. Dino Esposito, **Programming Microsoft ASP.NET**, Tata McGraw-Hill publishing Company Ltd, 2003

3. Chris Ullman , John Kauffman, Chris Hart, David Sussman, **Beginning ASP.Net 1.1 with VB.NET** , Wiley Publishing Inc, First Edition, 2003

4. Elliotte Rusty Harold, **XML 1.1 Bible**, Wesley Publications, Third Edition, 2004.

CORE XXVII – UNIFIED MODELING LANGUAGE

(For those who joined since 2018-19**)**

Semester : V **Hours/week: 4**
Code : FMCAC542 / GMCAC54 **Credits : 4**

Course Outcomes:

CO 1 : Understand object oriented software development and the purpose of modeling
CO 2 : Know the graphical notations and draw various diagrams in UML
CO 3 : Distinguish between logical and physical architecture of software being modeled
CO 4 : Describe the unified process for software development

UNIT I **[12 Hours]**

Introduction : Unified modeling language – the purpose of modeling - software development, methods and models -Object oriented software development – Disciplines of System development
An overview of UML : Views – Diagrams - Model elements - General mechanisms - Extending UML - Modeling with UML tools

UNIT II **[12 Hours]**

Use-Case Modeling : Basics of Use cases - Use-case diagram – System – actors - use cases – organizing, describing, assessing, testing and realizing use cases
classes and objects – class diagram – relationships – associations - generalization-dependencies and abstractions –constraints, expressions and derivations –interfaces and ports – packages - templates

UNIT III **[12 Hours]**

Dynamic Modeling : State machines - sending messages between state machines – activity diagrams – interaction diagrams
Advanced dynamic modeling : real time systems - real time concepts in UML – UML time elements - real time modeling in UML diagrams.

UNIT IV **[12 Hours]**

Logical Architecture – modeling patterns in UML - physical architecture - component diagram - deployment diagram – allocating artifacts to nodes

UNIT V **[12 Hours]**

A Process for using UML: Defining and understanding software engineering processes- the basis for a UML process - A traditional object-oriented method – the unified process - process tools - model quality-
Case study: Requirements – Analysis – Design – Implementation - Test and deployment

Text Book

1. Hans Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, **UML 2 Toolkit,** John Wiley publications, 2007.

References

70730832. Hans Erik Eriksson, Magnus Penker, **UML Toolkit**, John Wiley ,1998.
70730833. Grady Booch, Ivar Jacobson, James Rumbaugh, **UML Distilled,** Pearson Education Pvt. Ltd,II Edition, 2003.
70730834. Thomas Apender, **UML in an Instant**, Wiley dreamtech India Pvt. Ltd. 2002.

CORE XXVIII - WEB DESIGNING LAB

(For those who joined since 2018-19**)**

Semester : V **Hours/week: 4**
Code : GMCAC55P **Credit : 3**

Course Outcomes:

CO1: Demonstrate the fundamental concepts and features of HTML language
CO2: Design to create structure of web page, to store the data in web document, and transport information through web
CO3: Implement the role of XML for the management and delivery of electronic information for given application
CO4: Develop Web based applications by java script to have an interactive application such as Client Server Architecture

HTML Tags

1. Create a HTML page for displaying the personal information by using various tags such as Back ground color, heading tag, font tag.
2. Create a HTML page, which includes images and audio for advertising a product of a company.

Table

3. Create a HTML page for displaying the Tender notice.
4. To create a Time Table of your class using HTML.

Frame

5. Create a HTML Page to Advertise the Courses offered by our College using various frames.
6. Create a HTML page to advertise the Opportunities for the job in a Company with all related information.
7. Create a web page depicting the application form for a College and validate it.
8. Create a HTML page for displaying your Curriculum vita.

HTML Tags with Script

9. To create a web page for producing the results of the various departments.(B.A,B.Com, B.Sc) by entering the register number. The entry of the marks, course, programme and name should be done separately and script should be written for calculation of result and grade before publishing.
10. To create a simple web page for a company which includes the following details History, LOGO, Departments, Year wise report, Monthly report, Day to Day reports of the sales of the company.
11. Design a web calculator for doing simple calculation like addition, subtraction, multiplications and division using scripting.
12. Create simple CAI package for any subject which includes 10 topics.
13. To create a simple web site for our college includes the following details

History of the college and courses offered for UG and PG, Individual department details, Fee particulars for the courses, Application formats for both UG and PG.

14. Create your own personal web site with different details in different pages.
15. Create a web page for a web magazine
16. Create an on-line quiz which contains 2 level and 10 objective type questions in each level.

Validation

17. To create an application form for an email registration.

Frame & JavaScript

18. To create dictionary using frames where the words are displayed on one frame and when you click that word, the meaning will be displayed on the other frame.

Note: - Questions for the external examination will be based on the concepts learnt

CORE XXIX - SOFTWARE DEVELOPMENT FRAMEWORK LAB

(For those who joined since 2018-19**)**

Semester : V **Hours/week: 4**
Code : GMCAC56P **Credit : 3**

Course Outcomes:

CO 1: Able to write console applications
CO 2: Develop Windows and web Applications
CO 3: Demonstrate validation controls in web form
CO 4: Connect DataGrid control to database in Web application

Console Application

1. Calculate the area of a floor given its length and width
2. Calculate the factorial of a number N, assuming the number is more than zero
3. Check a given numbers(prime,perfect,Armstrong etc)
4. Generate the numbers(prime,perfect,Armstrong etc)
5. Calculate age for a person using properties
6. Sort a given list of numbers and find out the average of a list of numbers.
7. Display how many days are in a given month(check for leap years also)
8. Demonstrate Events, Delegates, and Interfaces

Windows Application

86667200. Build a simple calculator
86667201. Calculate the arithmetic operations using functions
86667202. Do String manipulation
86667203. Write a function that will return a approximate count of the number of words in a string
86667204. Create notepad
86667205. Create a greeting card generator

Web Application

88699264. Design an E-mail application form using standard controls and store these details in SQL tables
88699265. Create a login page and personal webpage. Enter the username and password in the login page. If the username and password are correct, personal web page should be loaded otherwise the error page should be loaded.
88699696. Create a student details form and validate the details using validation controls
88699697. Display employee details using data grid control
88699698. Display an Electricity bill using data list control
88699699. Display employee details using repeater control

Note :- Questions for the external examination will be based on the concepts learnt

ELECTIVE VI (A) - ORGANIZATIONAL BEHAVIOUR

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Code : FMCACE52A / GMCAE5A **Credit : 4**

Course Outcomes:

CO1 : Discuss the development of the field of organizational behaviour and explain the micro and macro approaches
CO2: Analyse and compare different models used to explain individual behaviour related to motivation and rewards
CO3 : Explain group dynamics and demonstrate skills required for working in groups (team building)
CO4 : Identify the various leadership styles and the role of leaders in a decision making process

UNIT I **[12 Hours]**

Organizational Behaviour: Overview: History of Organization Study- Methods used in Organizational Studies- Definition of Organizational Behaviour- Nature and Scope of Organizational Behaviour- Elements of Organizational Behaviour- Organizational Structure- Organizational Behaviour Process- Process of Behaviour- Models of Organizational Behaviour

Group Dynamics: Definition of Group- Meaning of Group- Importance of Group Dynamics- Five Propositions about Groups- Characteristics of Group- Types of Group- Theories of Group Formation- Group Behaviour- Group Norms- Group Role

UNIT II **[12 Hours]**

Group Decision Making: Definition of Decision Making- Characteristics of Decision Making- Nature of Decision Making- Types of Decision Making Individual and Group Decisions- Decision Making Process- Decision Making Styles

Work Motivation: Definition of Motivation- Meaning of Motivation- Theories of Motivation-Tools and Techniques of Motivation or Incentives-Incentives

UNIT III **[12 Hours]**

Stress Management: Definition of Stress Management- Personality and Stress- Causes of Stress- Consequences of Stress- Emotions and ailments- Stress and Gender- Individual Approaches- Organizational approaches- How to Manage Stress?-Stress Management Techniques- Models of Stress Management

Organizational Change: Meaning- Forces for Change- Types of Changes- Resistance to Change- Individual Level Change- Causes of Resistance to Change by Employees

UNIT IV **[12 Hours]**

Organizational Development: Meaning and Definition of Organizational Development- Process of Organizational Development

Personality: Definition of Personality- Personality and Color- Personality Traits- Personality Traits and Organizational Behaviour- Personality theories- Theories- Personality Tests

UNIT V **[12 Hours]**

Learning and Behaviour Modification: Definition of Learning and Behaviour Modification- Introduction of Learning- Characteristics of Learning-Types of Learning-Simple Non-associative Learning- Associative Learning- Learning Process- Principles of Learning

Total Quality Management (TQM): Definition of Total Quality Management (TQM)- Total Quality Management-Quality –Manifestation- Basic Concepts of TQM- Fundamental Principles of TQM

Text Book

1. Prof. Dr. A. Mustafa**, Organizational Behavior,**First Edition 2011, Aitbs Publishers, India

References

2. L M Prasad, **Organizational Behavior**, Fifth Edition 2011, Sultan Chand & sons
3. K Aswathappa, **Organizational Behavior**, Himalaya Publishing House, Tenth Edition ,2012
4. Mirza S Saiyadain , **Organizational Behavior,** Ninth Edition 2010, Tata McGraw Hill Education Private Ltd

ELECTIVE VI (B) - SOFTWARE TESTING

(For those who joined since 2018-19**)**

Semester : V **Hours/week: 4**
Code : FMCAE51B / GMCAE5B **Credits : 4**

Course Outcomes:

CO1: Differentiate Black and White box Testing

CO2: Acquire Knowledge about Test Phases for Internationalization Testing

CO3: Acquire Knowledge about Architecture of Software Test Automation

CO4: Get Knowledge about Design for Software Test Automation

UNIT I **[12 Hours]**

Principles of Testing,**White Box Testing:** Definition - Static Testing - Structural Testing-Challenges in White Box Testing. **Black Box Testing:** Definition-The need for Black Box Testing-When to do Black Box Testing-How to do Black Box Testing.

UNIT II **[12 Hours]**

Integration Testing: Definition -Integration Testing as a Type of Testing-Integration Testing as a Phase of Testing-Scenario Testing-Defect Bash. **System and Acceptance Testing:** System Testing Overview- the need for system Testing -Functional Versus Non-Functional Testing - Functional System Testing - Non-Functional Testing - Acceptance Testing. **Performance Testing:** Introduction-Factors Governing Performance Testing-Methodology for Performance Testing-Tools for Performance Testing-Process for performance Testing.

UNIT III **[12 Hours]**

Regression Testing: Definition -Types of Regression Testing-When to do Regression Testing-How to do Regression Testing-Best Practices in Regression Testing. **Internationalization(I18n) Testing:** Introduction-Primer on Internationalization-Test Phases for Internationalization Testing-Enabling Testing-Locale Testing- Internationalization Validation-Fake Language Testing-Language Testing-Localization Testing-Tools used for Internationalization.**Ad hoc Testing:** Overview of Ad Hoc Testing-Buddy Testing-Pair Testing-Exploratory Testing-Iterative Testing-Agile and Extreme Testing-Defect Seeding.

UNIT IV **[12 Hours]**

Testing of Object-Oriented System: Introduction-Primer on Object-Oriented Software-Difference in OO Testing.

Usability and Accessibility Testing: What is Usability Testing- Approach to Usability-When to do Usability Testing-How to Achieve Usability-Quality Factors for Usability-Aesthetics Testing-Accessibility Testing-Tools for Usability-Usability Lab Setup-Test Roles for Usability.

Testing Planning, Management, Execution and Reporting: Introduction-Test Planning-Test Management-Test Process-Test Reporting .

UNIT V **[12 Hours]**

Software Test Automation: Definition -Terms Used in Automation-Skills Needed for Automation-What to Automate - scope of Automation-Design and Architecture for Automation-Generic Requirements for test Tool/Frame work-Process Model for Automation-Selecting a Test Tool-Automation for Extreme Programming Model-Challenge in Automation. **Test Metrics and Measurements:** What are Metrics and Measurements-Why Metrics in Testing-Types of Metrics-Project Metrics-Progress Metrics-Productivity Metrics-Release Metrics.

Text Book

1. Srinivasan Desikan, Gopalaswamy Ramesh,**Software Testing Principles And Practices,**Dorling Kindersely(India)Pvt.LTD, 2006.

Reference

2. M G Limaye,**Software Testing Principles , Techniques And Tools**, Tata McGraw Hill Publishing Company Limited, 2009.
3. William Perry, "**Effective Methods of Software Testing**", Third Edition,Wiley Publishing 2007
4. Srinivasan Desikan and Gopalaswamy Ramesh, "**Software Testing – Principles and Practices**", Pearson Education, 2007.
5. Naresh Chauhan , "**Software Testing Principles and Practices** " Oxford University Press , New Delhi , 2010.

CORE XXX - Project

(For those who joined since 2018-19**)**

Semester : VI

Code : GMCAC61PW **Credits:12**

CO 1: Identify goals, constraints, deliverables, performance criteria and resource requirements in consultation with stakeholders

CO 2: Systematically collect requirements, plan, analyze, design, construct and test the code

CO 3: Document the various aspects of software development

Students have to undergo an individual project work either on campus or in an industry and appear for the viva voce examination with the software developed and document prepared by them

Elective Courses for other PG Programmes

Sem	Subject Code	Course	Subject Title	Hours/ Week	Credit	CIA	ESE	Total
III	GMCOE2B	Elective	Web Designing	5	4	40	60	100
IV	GMCOE3AP	Elective	Statistics through R Tool Lab	5	4	40	60	100

ELECTIVE: WEB DESIGNING
(For those who joined since 2018-19)

Semester : II **Hours/week: 5 (Theory : 3 Hrs Practical: 2 Hrs)**
Code : GMCOE2B **Credit : 4**

Course Outcomes:

CO1: Understand the principles of creating an effective web page
CO2: Become familiar with graphic design principles that relate to web design and learn how to I mplement these theories into practice

UNIT I **[9 Hours]**

Introduction: HTML, XML and world wide web
Hypertext Markup Language: Basic HTML-the document body-text-Hyperlinks-Adding more formatting-Lists-Using Color and Images-Images

UNIT II **[9 Hours]**

More HTML: Tables-Multimedia Objects-Frames-Forms-Toward Interactivity-The HTML Document Head in Detail-XHTML-An Evolutionary Markup

UNIT III **[9 Hours]**

Cascading Style sheets: Introduction-Using Styles: Simple Examples-Defining Your Own Styles-Properties and Values in Styles-Stylesheets -A Worked Example-Formatting Blocks of Information-Layers.

UNIT IV **[9 Hours]**

Cascading Stylesheets Two: TheDeign Of CSS2-Styling for Paged Media-Using Aural Presentation-Counters and Numbering.
An introduction To JavaScript: Dynamic HTML-JavaScript-Basics-Variables-string manipulation -Mathematical functions

UNIT V **[9 Hours]**

Statements –operators –arrays -functions
Dynamic HTML with JavaScript: Data Validation-Opening a New Window-Messages and Confirmations-Status bar-Writing to a Different Frame-Rollover Buttons-Moving Images-multiple Pages in a single download-a text-only menu system-floating logos.

Text book

1. Chris Bates,**Web Programming Building Internet Applications**,Third Edition, Wiley India P Ltd,New Delhi,2006

References

2. Thomas A Powell, **The Complete Reference Web Design**, Second Edition,Tata McGraw Hill,New Delhi,2002
3. Manju Bargavi, **Web Technology**, SAMS Publishers,Chennai,2013

4. Rajesh Kumar Sharma, **Web Designing**, Vayu Education of India, New Delhi,2009

WEB DESIGNING LAB (30 Hrs)

1. Creation of hyperlinks and frames in HTML
2. Creation of Lists in HTML
3. Create mark sheet preparation using table in Html
4. Linking documents and images
5. Create TBAK college web site using HTML tags
6. Create style sheets with the style elements.
7. Demonstration of dialog boxes using JavaScript
8. Perform arithmetic operations using JavaScript
9. Create rollover buttons
10. Create login format using arrays in JavaScript

Note: - Questions for the internal examination will be based on the concepts learnt

ELECTIVE: STATISTICS THROUGH R TOOL LAB
(For those who joined since 2018-19)

Semester : III **Hours/week: 5**
Code : GMCOE3AP **Credit : 4**

Course Outcomes:
CO1: Understand data analytics software
CO2: Enhance the problem solving, programming and debugging skill

1. Programs implementing correlation analysis
2. Programs implementing regression analysis
3. Programs implementing t-test
4. Programs implementing z-test
5. Programs implementing f-test
6. Programs implementing chi-square test
7. Programs implementing kruskal-wallis test
8. Programs implementing Likert scaling techniques
9. Programs implementing analysis of variance(ANOVA)
10. Programs implementing cluster analysis
11. Programs implementing factor analysis

Note-: Questions for Internal and External examination will be based on concept learnt

M Sc Information Technology
(Two Years Regular Programme)
(For those who joined since 2018-19)

Program Specific Outcomes (PSO)

PSO 1: Providing necessary theoretical and practical training in the field of Information Technology

PSO 2: Identify, design and develop appropriate information technology solutions

PSO 3: Function effectively as a team member or a leader to accomplish a common goal in a multidisciplinary team

PROGRAMME STRUCTURE

Sem	Subject Code	Course	Subject Title	Hrs/ wk	Credit	CIA Marks	ESE Marks	Total Marks

I	GMITC11	Core I	Object Oriented Programming in Java	6	5	40	60	100
	GMITC12	Core II	Computer Networks	6	5	40	60	100
	GMITC13	Core III	Operating System	6	5	40	60	100
	GMITC14P	Core IV	Programming in Java Lab	6	5	40	60	100
	GMITE1A GMITE1B	Elective I	a. Mobile Application Development / b. Soft Computing	6	5	40	60	100
	GMITX1O	Extra Credit	* Online Certification	-	2	-	-	-
			Total	**30**	**25+2**	**200**	**300**	**500**
II	GMITC21	Core V	Advanced Java	6	5	40	60	100
	GMITC22	Core VI	Software Engineering	6	5	40	60	100
	GMITC23	Core VII	Open Technologies	6 T-4 P-2	5	40 T-20 P-20	60	100
	GMITC24P	Core VIII	Advanced Java Lab	6	5	40	60	100
	GMITE2A / GMITE2B	Elective II	a. Probability and Statistics / b. Distributed Computing	6	5	40	60	100
	GMITX2/ GMITX2O	Extra Credit	Fluency in English / *Online Certification	-	2	-	100	100
			Total	**30**	**25+2**	**200**	**300+100**	**500+100**
III	GMITC31	Core IX	Data Mining and Warehousing	6	5	40	60	100
	GMITC32	Core X	Software Development Framework	6	5	40	60	100
	GMITC33	Core XI	Web Technology	6 T-4 P-2	5	40 T-20 P-20	60	100
	GMITC34P	Core XII	Software Development Framework Lab	6	5	40	60	100
	GMITE3A / GMITE3B	Elective III	a Human Resource Management / b. Mobile Communications	6	5	40	60	100
	GMITX3P / GMITX3O	Extra Credit	Internship / *Online Certification	-	2	100	-	100
			Total	**30**	**25+2**	**200 +100**	**300**	**500+100**
IV	GMITC41	Core XIII	Optimization Techniques	6	5	40	60	100
	GMITC42	Core XIV	Cloud Computing	6	5	40	60	100
	GMITC43PW	Core XV	Project	18	5	100	100	200
	GMSED4	Extra Credit	Skills for Employability Development	-	2	100	-	100
			Total	**30**	**15 + 2**	**280+100**	**220**	**400 + 100**
			Grand Total	**120**	**90 + 8**	**880+ 200**	**1120+ 100**	**1900+ 300**

***** For Online certification credit alone will be assigned on submission of certificate obtained through appearing for online Examination from EDX, Spoken Tutorial, NPTEL or Coursera etc., approved by the department.

CORE I - OBJECT ORIENTED PROGRAMMING IN JAVA

(For those who joined since 2018-19)

Semester : I **Hours/week: 6**

Code : GMITC11 **Credit : 5**

Course Outcomes:

CO1: Understand the internet standards and recent web technologies

CO2: Understand the fundamentals of JAVA

CO3: Make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API

CO4: Acquire knowledge about Multithreading and Exception Handling concept

CO5: Obtain knowledge on Applets and Swing concepts

CO6: Design front end web page and connect to the back end databases.

UNIT I **[15 Hours]**

Java Programming Fundamentals: The JAVA Language-The Key Attributes of Object-Oriented Programming- The Java Development Kit-A First Simple Program-Handling Syntax Errors-Create Blocks of Code-The Java Keywords-Identifiers in Java-The Java Libraries

Introducing Data Types and Operators: Why Data Types Are Important-Java's Primitive Types-Literals-A Closer Look at Variables-The Scope and Lifetime of Variables-Operators-Arithmetic Operators-Relational and Logical Operators-Short-Circuit Logical Operators-The Assignment Operator-Shorthand Assignments- Type Conversion in Assignments-using a Cast-Operator Precedence-Expressions

Program Control Statements: Input Character from the Keyword- if Statement-Nested ifs- if-else-if Ladder- switch Statement-Nested switch Statement- for Loop- Some Variations on the for loop- Declaring Loop Control Variables Inside the for Statement-The Enhanced for Loop- The while Loop-The do-while Loop- Used break to Exit a Loop- Use break as a Form of goto-Use continue-Nested Loops

UNIT II **[15 Hours]**

Introducing Classes, Objects and Methods: Class Fundamentals- How Objects are Created-Reference Variables and Assignment- Methods-Returning from a Method-Returning a Value- Using Parameters-Constructors-Parameterized Constructors- The new Operator Revisited- Garbage Collection and Finalizers-The this Keyword

More Data Types and Operators: Arrays- Multidimensional Arrays- Alternative Array Declaration Syntax-Assigning Array References-Using the length Member-The For-Each Style for Loop- Strings-Using the Command-Line Arguments- The Bitwise Operators-The ? Operator

A Closer Look at Methods and Classes: Controlling Access to Class Members-Pass Objects to Methods-How Arguments are Passed- Returning Objects- Method Overloading- Overloading Constructors-Recursion-understanding static- Introducing Nested and Inner Classes

UNIT III **[15 Hours]**

Inheritance: Inheritance Basics- Member Access and Inheritance- Constructors and Inheritance- Using super to Call Superclass Constructors- Using super to Access Superclass Members-Creating a Multilevel Hierarchy –When Constructors are Executed- Superclass Reference and Subclass Objects-Method Overriding –Overridden Methods Support Polymorphism-Why Overridden Methods?-Using Abstract Classes-Using final- The Object Class

Interfaces: Interface Fundamentals- Creating an Interface-Implementing an Interface- Using Interface References-Implementing Multiple Interfaces-Constants in Interfaces-Interfaces Can Be Extended-Nested Interfaces- Final Thoughts on Interfaces

Packages: Package Fundamentals-Packages and Member Access- Importing Packages-Static Import

UNIT IV **[15 Hours]**

Exception Handling: The Exception Hierarchy-Exception Handling Fundamentals – The Consequences of an Uncaught Exception-Exceptions Enable You to Handle Errors Gracefully-Using Multiple catch Clauses- Catching Subclass Exceptions –try Blocks Can Be Nested- Throwing and Exception –A Closer Look at Throwable -Using finally-Using throws –Java's Built-in Exceptions-New Exception Features Added by JDK 7-Creating Exception Subclasses

Using I/O: Java's I/O Is Built on Streams-Byte Streams and Character Streams-The Byte Stream Classes-The Character Stream Classes-The Predefined Streams- Using the Byte Steams- Reading and Writing Files Using Byte Streams- Automatically Closing a File- Reading and Writing Binary Data-Random-Access Files- Using Java's Character-Based Streams-File I/O Using Character Streams

UNIT V **[15 Hours]**

Multithreaded Programming: Multithreading Fundamentals-The Thread Class and Runnable Interface-Creating a Thread- Creating Multiple Threads- Determining When a Thread Ends-Thread Priorities-Synchronization-Using Synchronized Methods- The synchronized Statement-Thread Communication Using notify(), wait(), and notifyAll()-Suspending, Resuming and Stopping Threads

Enumeration, Autoboxing and Annotations: Enumerations- Java Enumerations are Class Types- The values() and valueof() Methods- Constructors, Methods, Instance Variables and Enumerations-Enumeration Inherit Enum- Autoboxing – Annotations

Applets and the Remaining Java Keywords: Applet Basics-A Complete Applet Skeleton-Applet Initialization and Termination- A key Aspect of an Applet's Architecture- Requesting Repainting- Using the Status Window- Passing Parameters to Applets-The Remaining Java Keywords

Text Book:

1. Herbert Schildt and Dale Skrien, **Java Fundamentals-A Comprehensive Introduction**, Tata McGraw Hill Education Private Limited, New Delhi, 2013

Reference Books:

2. Mahesh P. Bhave and Sunil A Patekar, **Programming with JAVA**, Dorling Kindersley Private Limited, 2009
3. Paul Deitel and Harvey Deitel, **Java How to Program,** PHI Learning Private Limited, New Delhi, Seventh Edition, 2010
4. keyur Shah, **Java 2 Programming,** Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002

CORE II – COMPUTER NETWORKS

(For those who joined since 2018-19)

Semester : I **Hours/week: 6**
Code : GMITC12 **Credit : 5**

Course Outcomes:

CO 1: Uunderstand the basic concept of computer networks, models, types of transmission and transmission media
CO 2: Know the error detecting, correction, types of Ethernet and various types of networks
CO 3: Acquire knowledge about various types of protocols
CO 4: Know the internet concept
CO 5: Acquire knowledge about types of cryptography techniques
CO 6: Understand the concept to safe guard the internet

UNIT I **[15 Hours]**

Introduction: Data Communications - Networks - The Internet. **Network Models:** Layers in the OSI model - TCP/IP protocol suite - Addressing. **Physical Layer: Transmission media:** Guided Media - Unguided Media. **Telephone and cable networks for data transmission:** Telephone Network.

UNIT II **[15 Hours]**

Data Link Layer: Error Detection and Correction: Introduction - Block coding - Linear block codes - Cyclic codes - Checksum. **Data Link Control:** Framing - Flow and error control - Noiseless channels -

Noisy channels- Point to point protocol. **Multiple Access:** Random Access - Channelization. **Ethernet:** Standard Ethernet - Fast Ethernet - Gigabit Ethernet - Bluetooth - Connecting Devices - Backbone Networks - Wireless WANs - Cellular Telephony - Satellite Networks.

UNIT III **[15 Hours]**

Network Layer and Transport Layer: IPV4 - IPV6 - Address Mapping - ICMP - IGMP - Delivery - Forwarding - Unicast routing protocols - Multicast Routing Protocols - Transport layer - Process to process delivery - User datagram protocol - TCP - Congestion control - Quality of Service

UNIT IV **[15 Hours]**

Application Layer: Domain Name System: - Name space - Domain Name Space - Distribution of name space - DNS in the Internet - Remote logging Telnet - Email - File Transfer - WWW and HTTP - Architecture - Web documents - HTTP - Multimedia - Digitizing audio and video - Audio and video compression.

UNIT V **[15 Hours]**

Security: Cryptography - Symmetric key cryptography - Asymmetric key cryptography - Network security - Security services - Message confidentiality - Message integrity - Message authentication - Digital signature -Entity authentication - Security in the internet - PGP - Firewalls.

Text Book

1. Behrouz A Forouzan, **Data Communications And Networking**, Tata Mc Graw Hill companies, New Delhi, Fourth Edition, 2006

References

2. Andrew S. Tannenbaum, **Computer Networks** , Pearson Education , New Delhi, Fourth Edition,2003
3. Douglas E. Comer, **Computer Networks and Internets**, Pearson Education , New Delhi, Fourth Edition, 2004
4. LL Peterson, BS Davie, **Computer Networks: A Systems Approach**, Fifth Edition, Morgan-Kauffman, 2011
5. W Stallings, **Cryptography and Network Security**, Principles and Practice Fifth Edition, Prentice-Hall, 2010

CORE III - OPERATING SYSTEM

(For those who joined since 2018-19**)**

Semester : I **Hours/week: 6**
Code : GMITC13 **Credit : 5**

Course Outcomes:

CO1: Acquire knowledge on functions, structures and history of operating systems

CO2: Able to understand the operating system components and its services

CO 3: Understand the scheduling

CO4: Able to demonstrate the mapping between the physical memory and virtual memory and memory management

CO5: Know the knowledge of deadlock

CO6: Be familiar process with protection, security mechanisms, management concepts including scheduling, synchronization deadlocks

UNIT I **[15 Hours]**

Introduction: Operating System -Mainframe systems- desktop systems- Multiprocessor Systems- Distributed systems- Clustered Systems- Real time systems- Hand held systems.

Operating System Structure: System components- Operating System services- System calls- - System structure- Virtual machines.

UNIT II **[15 Hours]**

Processes: Process concept- process scheduling- operations on processes- cooperating processes- Inter process Communication.
CPU Scheduling: Basic Concepts- Scheduling Criteria- Scheduling algorithms. **Process Synchronization**: Background- The critical system problem- semaphores- Classic problems of synchronization- Monitors.

UNIT III **[15 Hours]**
Deadlock: System Model-Deadlock Characterization- Methods of Handling Deadlock-Deadlock Prevention-Deadlock Avoidance- Deadlock Detection- Recovery from Deadlock.
Memory management: Background- Swapping- Contiguous memory allocation- Paging- Segmentation.

UNIT IV **[15 Hours]**
Virtual memory: Background- Demand paging- process creation- Page replacement
File system interface: File concepts- access methods- Directory structure
Mass storage structure: Disk structure- Disk Scheduling- Disk management- Swap space management- RAID structure.

UNIT V **[15 Hours]**
Distributed system structure: Background- Topology- Network types- communication- communication protocols.
Protection: Goals of protection- domain of protection- Access matrix- Implementation of Access matrix- revocation of access rights.
Security: The security problem- User authentication- Program threats- System threats- securing systems and facilities- Intrusion detection- Cryptography

Text Book
1. Silberschatz, Galvin, Gagne , **Operating System Concepts** , Wiley India Pvt. Ltd, New Delhi,VI edition, 2003

References
2. Milan Milenkovic ,**Operating System Concepts & Design** , Tata McGraw Hill Publishing Limited,New Delhi, II Edition, 1997
3. Dhananjay M. Dhamdhere, **Operating System A Concept-Based Approach**, Tata McGraw Hill Publishing Limited, New Delhi, III Edition,2012

CORE IV – PROGRAMMING IN JAVA LAB

(For those who joined since 2018-19)

Semester : I **Hours/week: 6**
Code : GMITC14P **Credit : 5**

Course Outcomes:
CO1: Create Java programs that solve simple Mathematical problems.
CO2: Understand the concepts of String Manipulation, Linear Search and Binary Search.
CO3: Apply OOP in Java programming like inheritance.
CO4: Implement the multi-threaded programs
CO5: Implement Exception handling
CO6: Demonstrate GUI components.

Formula Substitution
1. Find the factorial and binomial coefficient
2. Calculate mean, variance and standard deviation
3. Number conversions

Checking
70731360. Number checking (prime, perfect, etc)
Generation
70731792. Number generation(prime, perfect, etc)

Array

70732224. Arrange numbers and names in order

70732225. Perform matrix addition, subtraction, multiplication & transpose

Searching

70732656. Linear search and binary search

String

70732657. String manipulation (case conversion, reversing, etc)

OOPs Concept

70732658. Implement inheritance

70732659. Implement exception handling

70732660. Implement multithreading

Applet

70732661. Handle Keyboard events

70732662. Handle Mouse events

70732663. Handle Windows events

70732664. Simulate a calculator (arithmetic operations) using GUI components

70732665. Display an image file

70732666. Draw a picture

70732667. Free hand drawing

70732668. Implement menus

Note: - Questions for the external examination will be based on the concepts learnt

ELECTIVE I (A) - MOBILE APPLICATION DEVELOPMENT

(For those who joined since 2018-19)

Semester	**: I**	**Hours/week**	**: 6**
Code	**: FMCAE31D / GMITE1A**	**Credit**	**: 5**

Course Outcomes:

CO1: Know Era of Mobile Application Development

CO2: Acquire knowledge about Mobile Application Medium Types.

CO3: Differentiate Mobile Web Applications and Native Application.

CO4: Idea about Tools for Mobile Design.

CO5: Know Multiple Mobile Web Browsers.

CO6: Idea about Testing for Device,Desktop and Usability.

UNIT I **[15 Hours]**

A Brief History of Mobile: In the Beginning -The Evolution of Devices. **The Mobile Ecosystem:**Operators -Networks -Devices -Platforms - Operating Systems -Application Frameworks. **The need for Mobile** : Size and Scope of the Mobile Market- The Addressable Mobile Market- Mobile As a Medium.

UNIT II **[15 Hours]**

Designing for Context: Thinking in Context -Taking the Next Steps. **Developing a Mobile Strategy:** New Rules. **Types of Mobile Applications** :Mobile Application Medium Types.

UNIT III **[15 Hours]**

Mobile Information Architecture: Information Architecture-Mobile Information Architecture -The Design Myth .**Mobile Design** : Interpreting Design-The Mobile Design Tent-Pole-Designing for the Best Possible Experience-The Elements of Mobile Design -Mobile Design Tools -Designing for the Right Device -Designing for Different Screen Sizes.**Mobile Web Apps Versus Native Applications** :The Ubiquity Principle - When to Make a Native Application - When to Make a Mobile Web Application.

UNIT IV **[15 Hours]**

Mobile 2.0: Introduction to Mobile 2.0 -Mobile 2.0.**Mobile Web Development:**Web Standards - Designing for Multiple Mobile Browsers –Device Plans -Markup - CSS: Cascading Style Sheets-

JavaScript.**iPhone Web Apps:** The need for WebKit- Mobile Web App- Markup- CSS- JavaScript- Creating a Mobile Web App- Web Apps As Native Apps -PhoneGap -Tools and Libraries.

UNIT V **[15 Hours]**

Adapting to Devices: Adaptation is a "Necessity"- Strategy #1: Do Nothing- Strategy #2: Progressive Enhancement- Strategy #3: Device Targeting- Strategy #4: Full Adaptation- Domain to Use

Making Money in Mobile: Working with Operators- Working with an App Store- Add Advertising- Invent a New Model.**Supporting Devices** :Having a Device Plan- Device Testing- Desktop Testing- Usability Testing.

Text Book

1. Brain Fling, **Mobile Design and Development**, O'Reilly Media,USA, First Edition,2009.

References

2. James Pearce, **Professional Mobile Web Development With Wordpress, Joomla, And Drupal ,** Wiley India Pvt Ltd,New Delhi, First Edition ,2011
3. Adrian Kosmaczewski , **Mobile Java Script Application Development**, O'Reilly Media ,USA,First Edition, 2012.

ELECTIVE I (B) - SOFT COMPUTING

(For those who joined since 2018-19)

Semester : I **Hours/week: 6**
Code : FMCAE31B / GMITE1B **Credit : 5**

Course Outcomes:

CO1: Introduction, different architectures & Applications of neural network

CO2: Understand the concepts of Fuzzy Logic Controller & applications of Fuzzy logic

CO3: Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems

CO4: Apply genetic algorithms to combinatorial optimization problems

CO5: Evaluate and compare solutions by various soft computing approaches for a given problem

CO6: Analyse and integrate various soft computing techniques

UNIT I **[15 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 Back Propagation Network-The Perceptron Model-Single Layer Artificial Neural Network-Model of a Multilayer Perceptron-Back Propagation Learning-Applications-Selection of Various Parameters in BPN-Variations of Standard Back Propagation Algorithm

UNIT II **[15 Hours]**

Associative Memory-Auto Correlators-Hetero Correlators:Koskos Discrete BAM-Wang et al's Multiple Training Encoding Strategy-Exponential BAM-Associative Memory for Real Coded Pattern Pairs-Applications- Adaptive Resonance Theory-Introduction- ART1 –ART2-Applications

UNIT III **[15 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 System-Defuzzification Methods-Applications

UNIT IV **[15 Hours]**

Fundamentals of Genetic Algorithms-Genetic Algorithms-History-Basic Concepts-Creation of Offsprings-Working Principle-Encoding-Fitness Function-Reproduction-Inheritance Operators-Cross Over-Inversion and Deletion-Mutation Operator-Bitwise Operators-Bitwise Operators Used in GA-Generational Cycle-Convergence of Genetic Algorithm-Applications

UNIT V **[15 Hours]**

Integration of Neural Networks-Fuzzy Logic and Genetic Algorithms-Hybrid Systems-Neural Networks, Fuzzy Logic and Genetic Algorithms Hybrids-Genetic Algorithm Based Back Propagation Networks-GA Based Weight Determination-Applications-Fuzzy Back Propagation Networks

Text Book

1. S Rajasekaran and G A Vijayalakshmi, **Neural Networks, Fuzzy Logic And Genetic Algorithms-Synthesis And Applications**, Prentice Hall of India,New Delhi,2007

References

2. Satish Kumar, **Neural Networks – A Class Room Approach**, Tata McGraw Hill Publishing Company Limited,New Delhi, 2007
3. James A Freeman and David M Skapura, **Neural Netwoks Algorithms,Applications And Programming,** Pearson Education,New Delhi,2004
4. George J Klir, Tina A Folger**, Fuzzy Sets, Uncertainty And Information**, Prentice Hall of India private limited, New Delhi, 2006

CORE V - ADVANCED JAVA

(For those who joined since 2018-19)

Semester : II **Hours/week: 6**
Code : FMITC221 / GMITC21 **Credit : 5**

Course Outcomes:

CO 1: Understand network concepts
CO 2: Differentiate Swing and Applet
CO 3: Acquire Knowledge about Java Beans
CO 4: Get Knowledge about Database Connectivity
CO 5: Understand RMI Programming
CO 6: Get Knowledge about Servlet Programming

UNIT I **[15 Hours]**

JSP- JEEE- JSF- J2ME- Struts .**Networking with Java :** Basics of Networking- Sockets in Java-Client-Server in Networking - Proxy Servers - Internet Addressing - Domain Naming Service(DNS) -Inet4 Addresses and Inet6 Addresses- The URL Class- The URI Class- TCP/IP and Datagram - Java Net APIs – InetAddresses - InetAdress Caching- Creating and Using Sockets- Creating TCP Clients and Servers- A Whois Example- Submitting an HTML Form from Java- Handling URL- Using URLConnection Objects- Working With Datagrams- Datagram Server and Client

Swing: The Java Foundation Classes- Swing- Heavyweight versus Lightweight Components- Swing Features- Graphics Programming Using Panes- Model View Controller Architecture- Working With Swing- Preparing to Create a Swing Applet- Understanding Root Panes, Layered Pane and Content Panes- Creating a Swing Applet and Application – Closing JFrame Windows –Selecting Component Borders

UNIT II **[15 Hours]**

Swing: Labels and Text Fields – Buttons – Toggle Buttons – Check Boxes and Radio Buttons – Using Labels, Image Icons, Images in Labels, Text Fields – Setting Text Field Alignment- Creating Password Field, Text Areas, Editor Panes, Text Panes- Using HTML and RTF files in Editor Panes- Setting Text Pane Text Attributes- Working with Sound in Applets and Application – Using Buttons, Check Boxes, Radio Buttons

Swing: Combo Boxes, Progress Bars - Creating Combo Boxes- Handling Combo Boxes Selection Events- Creating Editable Combo Boxes - Adding Images to Combo Boxes -Creating a Combo Box Model- Creating a Combo Box Custom Renderer- Creating Progress Bars- Updating Progress Bars- Handling Progress Bar Events

UNIT III **[15 Hours]**

Swing: Menus and Toolbars - Creating a Menu Bar- Creating a Menu- Creating a Menu Item - Creating a Basic Menu System - Adding Images to Menu- Creating Check Box Menu Items - Creating Radio Button Menus- Creating Sub Menus, Pop- Up menus - Creating Toolbars- Adding Combo Boxes and Other Controls to Tool Bars.

Working with Java Beans: Introduction – Introspection – Customizers - Understanding Java Beans- Designing programs Using Java Beans - Creating Applets that Use Java Beans- Creating a Java Bean- Creating a Bean Manifiest File and JAR File- Using a New Bean- Adding Controls to Beans - Giving a Bean Properties- Design Patterns for Properties- Simple Properties- Design Patterns for Events- Methods and Design Patterns- Creating Bound Properties- Giving a Bean Methods- Giving a Bean an Icon- Creating a BeanInfo class- Persistence- The Java Beans API

UNIT IV **[15 Hours]**

Talking to Database: JDBC- JDBC versus ODBC and Other APIs- Two- Tier and Three- Tier Models- Introducing SQL- The JDBC Package - Types of JDBC Drivers- Javasoft Framework-Driver Interface and Driver Manager Class - The Essential JDBC Program- Using a Prepared Statement Object- The Interactive SQL Tool- Using Tables- Defining a Table Model

JDBC in Action: Data Types and JDBC – Scrollable Result Sets - Batch Updates - Mapping Relational Data into Java Objects - Basic JDBC Types- Advanced JDBC data types

UNIT V **[15 Hours]**

Understanding RMI: Remote Method Invocation (RMI) - Client/Server Architecture- Implementing RMI - Limitation of RMI, A Model RMI Transaction -Writing an RMI Server- Designing a Remote Interface- Implementing a Remote Interface- Passing Object in RMI- Implementing the Server's Main Method- Creating a Client Program- Compiling and Running the Example – Exporting with Unicast Remote Object – Exporting Activatable Objects

Understanding Servlet Programming: Servlet2.4- Overview of Servlets- Servlet API- Servlet and Environment State- Servlet Lifecycle- Security Features- HTML Aware Servlet - HTTP Specific Servlets - Performance Features- Three Tier Applications- Web Publishing System- Package javax..Servlet Description-Servlet Configuration- How the Application works

Text Book:

1. Steven Holzner et al , **Java 2(JDK 5 Edition) Programming Black Book** , Dreamtech press, New Delhi, 2006.

Reference Books:

2. James Gosling, David Holmes, Ken Arnold, **The Java Programming Language**, Addison-Wesley Professional, 4th edition, 2005.

70733088. Dr. Rajkumar Buyya, Dr. S. Thamarai Selvi, Mr. Xingchen Chu, **Object Oriented Programming with Java: Essentials and Applications**, Tata McGraw Hill publishing company Ltd, 2009.

70733089. Troy Bryan Downing, **Java RMI Remote Method Invocation** , IDG Books India,2000.

70733090. Ivan Bayross, **Web enabled Commercial Application Development using Java 2.0**, BPB Publications, 2000.

70733091. Laurence Vanheusuve, **Mastering Java Beans**, BPB Publications, New Delhi,1997

70733092. James Goodwill, **Developing Java Servlets**, Techmedia, New Delhi, 2000.

CORE VI - SOFTWARE ENGINEERING

(For those who joined since 2018-19)

Semester : II **Hours/week: 6**

Code : FMITC231 / GMITC22 **Credit : 5**

Course Outcomes:

CO 1: Classify the models for software development
CO 2: Know how to gather requirements and design software
CO 3: Study the testing strategies to test the software for errors and omissions
CO 4: Manage the risks and ensure quality of the software developed
CO 5: Get the knowledge of quality management
CO 6: Understand the configuration management

UNIT I [**15 Hours]**

Introduction: Software –changing nature of software – software engineering: a layered technology – a process framework – process models: prescriptive models –waterfall model – incremental process models – evolutionary process models – specialized process models

Software Engineering Practice: communication practices - planning practices – modeling practices – construction practice – deployment

UNIT II [**15 Hours]**

Requirements Engineering: A bridge to design and construction – requirements engineering tasks – initiating the requirements engineering process – eliciting requirements – developing use-cases – building the analysis model – negotiating requirements – validating requirements

Design Engineering: Design within the context of software engineering – design process and design quality – design concepts –design model –pattern-based software design

UNIT III [**15 Hours]**

Testing Strategies: A strategic approach to software testing – strategic issues – test strategies for conventional software – test strategies for object- oriented software – validation testing – system testing – the art of debugging

Testing Tactics: software testing fundamentals – black-box and white-box testing – white-box testing – basis path testing – control structure testing – black-box testing – object-oriented testing methods – testing for specialized environments – testing patterns

UNIT IV [**15 Hours]**

Project Management: Management spectrum –people –product –process – project

Risk Management: reactive versus proactive risk strategies – software risks- risk identification – risk projection –risk refinement – risk mitigation, monitoring and management – RMMM plan

UNIT V [**15 Hours]**

Quality Management: Quality concepts – software quality assurance – software reviews – formal technical reviews – statistical software quality assurance – software reliability – The ISO 9000 quality standards –SQA plan

Change Management: Software configuration management –SCM repository –SCM process

Text Book

1. Roger S. Pressman, **Software Engineering A Practitioner's Approach**, Tata McGraw Hill International edition,New Delhi,Sixth Edition 2005

References

2. Ian Sommerville, **Software Engineering**, Pearson Education ,New Delhi,7th edition, 2004
3. Samarjeet kaur , Sandhir Sharma & P.P Singh, **Software Engineering – Complete Course Book**, Deep & Deep Publications Pvt. Ltd., New Delhi , 2006
4. Waman S Jawadekar, **Software Engineering – Principles and Practice**, Tata McGraw Hill Education Private Limited, New Delhi ,2004

CORE VII – OPEN TECHNOLOGIES

(For those who joined since 2018-19)

Semester : II **Hours/week: 6 (T:4 P:2)**
Code : FMITE31B / GMITC23 **Credit : 5**

Course Outcomes:

CO 1: Know the basic concepts of free software
CO 2: Acquire the knowledge of new generation of web framework – Django
CO 3: Deploy the Django application
CO 4: Understand the concept of static and dynamic pages
CO 5: Know the knowledge of server side web application framework: Ruby on Rails (Rails)
CO 6: Able to fill the custom style sheet

UNIT I **[12 Hours]**

Introduction: The concept of software freedom-motivations-consequences of the freedom of software.
A bit of History:Free software before free software-beginning BSD,GNU-everything in its way.Legal aspects:Brief introduction to intellectual property-free software licenses.
Case studies:Linux-Mozilla-Red Hat Linux.

UNIT II **[12 Hours]**

PYTHON: Introduction to Django-templates-models-forms

UNIT III **[12 Hours]**

PYTHON: Deploying Django-caching-integrating with legacy databases and applications-security

UNIT IV **[12 Hours]**

RUBY: Introduction-Up and running-deploying a demoapp-static and dynamic pages

UNIT V **[12 Hours]**

RUBY: Rails –flavored Ruby-filling in the layout-modeling users

Text Books

1. Jesus M Gonzalez-Barahona,Joaquin Seoane Pascual,Gregories Robles , **Introduction To Free Software,** Free Technology Academy,2009
2. Adrian Holovaty,Jacob Kaplan-Moss,**The Definitive Guide To Django:Web Development Done Right,** Apress,New York,2009
3. Michael Hartl, **Ruby On Rails Tutorial:Learn Web Development With Rails**, Addison – Wesley Professional Ruby series,Bostan,2012

References

4. David Beazley,Brian K Jones**, Python Cookbook**, O'Reilly media,2013
5. David Thomas, Andrew Hunt, **Programming Ruby:The Pragmatic Programmer's Guide,** Addison Wesley , Bostan,2000

OPEN TECHNOLOGIES (LAB) **Hours/week: 2**

PYTHON

Simple Commands

1. Display the message
2. Convert decimal number into binary number
3. Display fibonacci sequence using recursion
4. Count the number of each vowel
5. Implement the Arithmetic Quiz
6. Convert a date read from the user, given in DD/MM/YYYY format into written format. For example, Enter a date in DD/MM/YYYY Format: 16/7/2003 Output: 16 July, 2003
7. Print the contents of a file in uppercase using function
8. Sort the contents of a file using function

OOPs Concept

9. Implement Operator Overloading

Web Development

10. Create a button with the text, "Hello World"
11. Create a simple application window with menus and submenus
12. Create a simple application window with displaying lines

13. Create a web site for displaying message
14. Create a simple blog using models
15. Create a simple blog using templates
16. Create a web page for a web magazine

RUBY ON RAIL

17. Display a message "Helloworld"
18. Create a simple blog
19. Send mail to anybody

Note:-Questions for Internal and External examination will be based on concept learnt

CORE VIII - ADVANCED JAVA LAB

(For those who joined since 2018-19)

Semester : II **Hours/week: 6**
Code : GMITC24P **Credit : 5**

Course Outcomes:

CO 1: Understand Java network package
CO 2: Differentiate AWT and Swing controls.
CO 3: Acquire Knowledge about Java Beans.
CO 4: Get Knowledge about Database Connectivity
CO 5: Understand RMI Programming
CO 6: Get Knowledge about Servlet Programming.

Networking

1. Do one and two way communication(s)

Swing

2. Display current date & time in different format.
3. Set a foreground and background color for label
4. Create simple calculator

Bean

5. Create button
6. Create text box which accepts only characters
7. Create text box which accepts only integer value

JDBC

8. Prepare a mark list containing Name, Reg no, Marks for Maths, Physics and Chemistry for 5 students are given. A student will be declared as "PASS" when the marks of maths, physics and chemistry are 40 or more otherwise as "FAIL"
9. Maintain a telephone directory in a database and use it to find the address of a person. This system should contain two options, one to add new numbers and another to find the address of a person, if the phone number is given. Each record in the telephone directory contains the following details: Name, Phone number and Address
10. Prepare a payroll system for a company

RMI

11. Display a string message
12. Perform arithmetic operations
13. Find factorial
14. Generate Fibonacci series
15. Calculate income tax

SERVLET

16. Display simple message
17. Demonstrate how many times the user has accessed the same Servlet
18. Generate random numbers

19. Prepare a mark list containing Name, Reg no, Marks for Maths, Physics and Chemistry for 5 students are given. A student will be declared as "PASS" when the marks of maths, physics and chemistry are 40 or more otherwise as "FAIL". Display list of students who are failed in different subject

20. Prepare a payroll system for a company. Display employee details who are paying income tax and working more than ten years

Note: - Questions for the external examination will be based on the concepts learnt

ELECTIVE II (B) – DISTRIBUTED COMPUTING

(For those who joined since 2018-19)

Semester : II **Hours/week: 6**
Code : FMITE21D / GMITE2B **Credit : 5**

Course Outcomes:

CO 1: Differentiate among concurrent, distributed and networked computing

CO 2: Implement Remote procedure calls, IPC mechanisms in distributed systems

CO 3: Improve the performance and reliability of distributed programs

CO 4: Design and build newer distributed file systems for any OS

CO 5: Describe the advantages and approaches used to solve problems in the distributed computing

CO 6: Have the ability to implement selected algorithms for distributed computing systems

UNIT I **[15 Hours]**

Introduction: Definition of a Distributed System-Goals-Types of Distributed Systems.**Architectures:** Architectural Styles - System Architectures-Architectures versus Middleware-Self-Management in Distributed Systems. **Processes:** Threads-Clients-Servers-Code Migration-Software Agents.

UNIT II **[15 Hours]**

Communication: Fundamentals-Remote procedure Call-Message-Oriented Communication- Stream-Oriented Communication- Multicast Communication. **Naming**: Names ,Identifiers and Addresses-Flat Naming- Structured Naming-Attribute based Naming.

UNIT III **[15 Hours]**

Synchronization: Clock Synchronization-Logical Clock- Mutual Exclusion Global Position of Nodes-Election Algorithm.

Consistency and Replication: Introduction-Data Centric consistency Models-Client centric consistency Models-Replica Management-Consistency Protocols.

UNIT IV **[15 Hours]**

Fault Tolerance: Introduction to Fault Tolerance-Process Resilience-Reliable client-server communication-Reliable group communication-distributed Commit-Recovery.**Security:** Introduction to Security-Secure Channels-Access Control-Security
Management.

UNIT V **[15 Hours]**

Distributed Object-based systems: Architecture-Processes-Communication-Naming-Synchronization-Consistency and replication-Fault Tolerance-Security.**Distributed File System:** Architecture-Processes-Communication-Naming-Synchronization-Consistency and replication-Fault Tolerance-Security

Text Book

1. Andrew S.Tanenbaum and Maarten Van Steen, **Distributed Systems Principles And Paradigms**, Pearson Education,New Delhi,2nd Edition, 2007

Reference

86663360. George Coulouris, Jean Dellimore and Tim KIndberg, **Distributed Systems Concepts and Design**, Pearson Education,New Delhi, 4th Edition, 2005

CORE IX - DATA MINING AND WAREHOUSING

(For those who joined since 2018-19)

Semester : III **Hours/week: 6**

Code : FMITC311 / GMITC31 **Credit : 5**

Course Outcomes:

CO 1: Know the Basic Concepts of Data Mining

CO 2: Get knowledge about Data Pre processing Steps

CO 3: Understand the OLAP Technology

CO 4: Acquire knowledge about Types of Classification Methods in Data Mining

CO 5: Analyse types of Data clusters and methods

CO 6: Learn types of Data Mining

UNIT I **[15 Hours]**

Data Mining: Data Mining Functionalities-Classification of Data Mining Systems- Data Mining Task Primitives-Integration of a Data Mining System with a Database or Data Warehouse System-Major Issues in Data Mining.

Data Preprocessing: Data Cleaning-Data Integration and Transformation-Data Reduction – Discretization and Concept Hierarchy Generation.

UNIT II **[15 Hours]**

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse-A Multidimensional Data Model-Data Warehouse Architecture-Data Warehouse Implementation- From Data Warehousing to Data Mining.

Data Cube Computation and Data Generalization: Further Development of Data Cube and OLAP Technology-Attribute-Oriented Induction-An Alternative Method for Data Generalization and Concept Description-Mining various kinds of Association Rules.

UNIT III **[15 Hours]**

Classification and Prediction: Issues Regarding Classification and Prediction-Classification by Decision Tree Induction-Bayesian Classification-Classification by Back propagation–Associative Classification:Classification by Association Rule Analysis-Other Classification Methods-Prediction-Accuracy and Error Measures.

UNIT IV **[15 Hours]**

Cluster Analysis : What is Cluster Analysis-Types of data in Cluster Analysis-A Categorization of Major Clustering Methods-Partitioning Methods-Hierarchical Methods-Density based Methods-Grid based Methods-Model based Clustering Methods-Clustering high dimensional data-Constraint based Cluster Analysis-Outlier Analysis.

UNIT V **[15 Hours]**

Mining Complex Types of Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects-Spatial Data Mining-Multimedia Data Mining-Text Mining -Mining the World Wide Web.

Applications and Trends in Data Mining: Data Mining Applications-Data Mining System Products and Research Prototypes-Additional Themes on Data Mining-Social Impacts of Data Mining-Trends in Data Mining.

Text Book

1. Jiawei Han and Micheline Kamber, **Data Mining : Concept and Technique**, Morgan Kaufmann Publishers,San Francisco, First Indian Reprint, 2006

References

86665040. Pieter Adriaans and Dolf Zantinge , **Data Mining** , Pearson Education,New Delhi, Ninth Indian Reprint 2003

86665041. Anand Rajaraman and Jeffrey David Ullman, **Mining of Massive Datasets**, Cambridge University,Press, 2012.

86665042. Pete Warden, **Big Data Glossary**, O'Reilly, 2011.

CORE X – SOFTWARE DEVELOPMENT FRAMEWORK

(For those who joined since 2018-19)

Semester : III **Hours/week: 6**

Code : FMITC321 / GMITC32 **Credit : 5**

Course Outcomes:

CO 1: Understand the basic concepts of .net and different languages
CO 2: Differentiate the value and reference type
CO 3: Acquire the knowledge of Page class and web controls
CO 4: Design a web form with validation controls
CO 5: Know the data base concept with .Net
CO 6: Able to use DataGrid and DataList controls in the Web programming

UNIT I **[15 Hours]**

The .NET Framework: . Net programming Framework-VB.NET,C#.NET and the .NET Languages-The Common Language Runtime-The .NET Class Library-ASP.NET-Visual Studio .NET.

Learning the .NET Languages: The .NET Languages-Data Types-Declaring Variables-Scope and Accessibility-Variable Operations-Object-Based Manipluation-Conditional Structures-Loop Structures-Functions and Subroutines.

Types ,Objects and Namesspaces: The Basics about classes –Value Types and Reference Types-Advanced Class Programming-Understanding Namespaces and Assemblies.

UNIT II **[15 Hours]**

ASP.NET APPLICATIONS: ASP.NET Applications-Code-Behind-The Global.asax Application File-Understanding ASP.NET Classes-ASP.NET Configuration. Web Form Fundamentals: A Simple Page Applet-A Deeper Look at HTML Control Classes-The Page Class-Accessing HTML Server Controls.

Web Controls: Stepping Up to Web Controls-Web control Classes-AutoPostBack and Web Control Events-A Simple Web Page Applet – Assessing Web Controls.

UNIT III **[15 Hours]**

Using Visual Studio .NET: The promise of Visual Studio.NET-Starting a Visual Studio.Net Project – The Web form Designer-Writing Code-Visual Studio.NET Debugging-Working Without Visual Studio.NET

Validation and Rich Controls: Validation-A simple Validation Example-Understanding Regular Expressions-A Validated Customer Form-Other Rich Controls.

State Management: The Problem of State-Viewstate-Transferring Information-CustomCookies-Session State-Configuration-Application State.

UNIT IV **[15 Hours]**

Tracing,Logging and Error Handling: Common Errors-The .NET Exception Object-Handling exceptions-Throwing Your Own Exceptions-Logging Exceptions-Error Pages-Page Tracing.

Overview of ADO.NET: Introducing ADO.NET and DataManagement-Characteristics of ADO.Net-The ADO.NET Object Model.

ADO.NET Data Access: About the ADO.NET Examples-SQL Basics-The SQL Select Statement-Update-Insert-Delete-Accessing Data the Easy Way-Creating a connection-Defining a Select Command-Using a Command with a DataReader-Updating Data-Accessing Disconnected Data-Selecting Multiple Tables-Modifying Disconnected Data-Updating Disconnected Data

UNIT V **[15 Hours]**

Data Binding: Introduction-Single-Value Data Binding-Repeated-Value Data Binding-Data Binding with Databases.

The DataList,DataGrid and Repeater: Introducing Templates-Using Templates with the DataList-Data Binding with Multiple Templates-Comparing the Template Controls-Selecting Items-Editing Items-Paging with the DataGrid-Sorting with the DataGrid

Using XML: XML's Hidden Role in .NET-XML Explained- The XMLClasses-XML Validation-XML Display and Transforms-XML in ADO.NET

Text Book

1. Matthew MacDonald, **The Complete Reference ASP.NET**, Tata McGraw-Hill Publishing Company Ltd, 2002

References

86665520. Dino Esposito, **Programming Microsoft ASP.NET**, Tata McGraw-Hill publishing Company Ltd, 2003

86665521. Chris Ullman , John Kauffman, Chris Hart, David Sussman, **Beginning ASP.Net 1.1 with VB.NET** , Wiley Publishing Inc, First Edition, 2003

86665522. Elliotte Rusty Harold, **XML 1.1 Bible**, Wesley Publications, Third Edition, 2004

CORE XI- WEB TECHNOLOGY

(For those who joined since 2018-19)

Semester : III **Hours/week: 6 (T:4 P:2)**
Code : FMITC331 / GMITC33 **Credit : 5**

Course Outcomes:

CO 1: Develop a dynamic webpage by the use of java script and DHTML
CO 2: Write a well formed / valid XML document
CO 3: Create web pages using XHTML and Cascading Style Sheets
CO 4: Build Client side and Server side programming
CO 5: Create XML documents and Schemas
CO 6: Acquire knowledge on Web Services such as SOAP, UDDI and WSDL

UNIT I **[12 Hours]**

Introduction to computer and the Internet: Introduction, History of the Internet, Personal Computing, History of the World Wide Web, World Wide Web Consortium, Hardware Trends, Key Software Trend:Object Technology, JavaScript: Object-Based Scripting for the Web, Browser Portability, Microsoft .Net, Dynamic HTML, Internet and World Wide Web How to Program.

Adobe Photoshop Elements:Creating Web Graphics: Introduction, Image Basics, Vector and Raster Graphics, Toolbox, Layers, Screen Capture, File Formats.

Introduction to XHTML: Introduction, Editing XHTML, First XHTML Example, W3C XHTML Validation Service, Headers, Linking, Images, Special Characters and More Line Breaks, Unordered Lists, Nested and Ordered Lists.

UNIT II **[12 Hours]**

Java Script: Introduction to Scripting- Introduction, Simple Program, Obtaining User Input with Prompt Dialogs.

Java Script Functions: Introduction, Program Modules in JavaScript, Programmer-Defined Functions, Function Definitions, JavaScript Global Functions

Java Script Arrays : Introduction, Arrays, Declaring and Allocating Arrays, Examples Using Arrays, Passing Arrays to Functions, Multidimensional Arrays

Java Script Objects : Introduction, Math Object, String Object, Date Object, Boolean and Number Objects, document Object, Window Object, Using Cookies.

UNIT III **[12 Hours]**

Cascading Style Sheets: Introduction, Inline Styles, Embedded Style Sheets, Conflicting Styles, Linking External Style Sheets, W3C CSS Validation Service, Positioning Elements, Backgrounds, Element Dimensions, Text Flow and the Box Model, User Style Sheets.

Extensible Markup Language (XML) : Introduction, Structuring Data, XML Namespaces, Document Type Definitions and Schemas, XML vocabularies, Document Object Model, DOM Methods, Simple API for XML, Extensible Style sheet Language, Simple Object Access Protocol, Web Services, Water™ XML-Based Programming Language.

UNIT IV **[12 Hours]**

Dynamic HTML Filters and Transitions : Introduction, Flip Filters, Transparence with the chroma Filter, Creating Image masks, Miscellaneous Image Filters, Adding Shadows to Text, Creating Gradients with alpha, Making Text glow, Creating Motion with blur, Using the wave Filter, Advanced Filters, blendTrans Transition, reveal Trans Transition.

Dynamic HTML Data Binding with Tabula Data Control : Introduction, Simple Data Binding , Moving within a Recordset, Binding to an img, Binding to a table, Sorting table data, Advanced sorting and Filtering, Data Binding Elements

UNIT V **[12 Hours]**

Introduction to Web Services: Overview of Web Services- Web Service Architecture- Component of Web Service-**Introduction to SOAP:** Defining SOAP- Architecture of SOAP- Processing of SOAP messages-**Introduction to UDDI:** Defining UDDI- Working with UDDI business directories- UDDI specifications- UDDI scenarios-**Introduction to WSDL:** Overview of WSDL.

Text Books

1. H.M. Deitel, P.J. Deitel and A.B. Goldberg, **Internet & World Wide Web –How To Program**, Prentice-Hall, Inc.Third Edition,2005
2. Geetanjali Arora, Sai Kishore, **XML Web Services Professional Projects –with NIIT**, Premier Press, 2002

References

86666000. Raj Kamal, **Internet And Web Technologies**, Tata McGraw Hill publishing company Ltd , New Delhi , 2002

86666001. Thomas A. Powell, **The Complete Reference Web Design**, Tata McGraw Hill publishing company Ltd , New Delhi , 2nd edition, 2002

WEB TECHNOLOGY (LAB)

Hours/week: 2

HTML Tags

1. Create a HTML page for displaying the personal information by using various tags such as Back ground color, heading tag, font tag.
2. Create a HTML page, which includes images and audio for advertising a product of a company.

Table

3. Create a HTML page for displaying the Tender notice.
4. To create a Time Table of your class using HTML.

Frame

5. Create a HTML Page to Advertise the Courses offered by our College using various frames.
6. Create a HTML page to advertise the Opportunities for the job in a Company with all related information.
7. Create a web page depicting the application form for a College and validate it.
8. Create a HTML page for displaying your Curriculum vita.

HTML Tags with Script

9. To create a web page for producing the results of the various departments.(B.A,B.Com, B.Sc) by entering the register number. The entry of the marks, course, programme and name should be done separately and script should be written for calculation of result and grade before publishing.
10. To create a simple web page for a company which includes the following details History, LOGO, Departments, Year wise report, Monthly report, Day to Day reports of the sales of the company.
11. Design a web calculator for doing simple calculation like addition, subtraction, multiplications and division using scripting.
12. Create simple CAI package for any subject which includes 10 topics.
13. To create a simple web site for our college includes the following details

History of the college and courses offered for UG and PG, Individual department details, Fee particulars for the courses, Application formats for both UG and PG.

14. Create your own personal web site with different details in different pages.
15. Create a web page for a web magazine
16. Create an on-line quiz which contains 2 level and 10 objective type questions in each level.

Validation

17. To create an application form for an email registration.

Frame & JavaScript

18. To create dictionary using frames where the words are displayed on one frame and when you click that word, the meaning will be displayed on the other frame.

Note: - Questions for the internal examination will be based on the concepts learnt

CORE XII - SOFTWARE DEVELOPMENT FRAMEWORK LAB

(For those who joined since 2018-19)

Semester: III **Hours/week: 6**
Code : GMITC34P **Credit : 5**
Course Outcomes:

CO 1: Able to write console applications
CO 2: Implement String object in console and windows applications
CO 3: Develop Windows Application
CO 4: Design Web Application
CO 5: Implement validation controls in web form
CO 6: Connect DataGrid control to database in Web application

Console Application

1. Calculate the area of a floor given its length and width
2. Calculate the factorial of a number N, assuming the number is more than zero
3. Check a given numbers(prime,perfect,Armstrong etc)
4. Generate the numbers(prime,perfect,Armstrong etc)
5. Calculate age for a person using properties
6. Sort a given list of numbers and find out the average of a list of numbers.
7. Display how many days are in a given month(check for leap years also)
8. Demonstrate Events, Delegates, and Interfaces

Windows Application

9. Build a simple calculator
10. Calculate the arithmetic operations using functions
11. Do String manipulation
12. Create notepad
13. Create a greeting card generator

Web Application

14. Design an E-mail application form using standard controls and store these details in SQL tables
15. Create a login page and personal webpage. Enter the username and password in the login page. If the username and password are correct, personal web page should be loaded otherwise the error page should be loaded.
16. Create a student details form and validate the details using validation controls
17. Display employee details using data grid control
18. Display an Electricity bill using data list control
19. Display employee details using repeater control

Note :- Questions for the external examination will be based on the applications learnt

ELECTIVE III (B) - MOBILE COMMUNICATIONS

(For those who joined since 2018-19)

Semester: III **Hours/week: 6**
Code : FMITC121 / GMITE3B **Credit : 5**

Course Outcomes:

CO 1: To make students familiar with various generations of mobile communications.

CO 2: Understand the cellular radio concepts

CO 3: Identify mobile communications such as the allocation of the limited wireless spectrum by government regulatory agencies

CO 4: Understand Wireless LAN

CO 5: Describe Adhoc networks

CO 6: Know wireless application protocol and architecture

UNIT I **[15 Hours]**

Introduction –Applications –A Simplified Reference Model - Wireless Transmission – Frequencies for Radio Transmission – Signals – Antennas – Signal propagation – Multiplexing - Modulation – Spread spectrum – Cellular systems.

Medium access control – Motivation for a specialized MAC – SDMA – FDMA .

UNIT II **[15 Hours]**

Telecommunication Systems – GSM , Satellite Systems – GEO 139, LEO 139, MEO 140 - Routing – Localization – Handover – Broadcast systems – Overview – Cyclic repetition of Data - Digital Audio Broadcasting – Digital Video Broadcasting – Convergence of broadcasting and mobile communications.

UNIT III **[15 Hours]**

Wireless LAN – Infrared vs. Radio Transmission – Infrastructure and ad hoc Networks – IEEE 802.11 – HIPERLAN – Blue tooth

Cordless systems and wireless local loop: cordless systems-wireless local loop-wimax and IEEE 802.16 broadband wireless access standards

UNIT IV **[15 Hours]**

Mobile network layer – Mobile IP Dynamic host configuration protocol –Ad hoc networks

Mobile transport layer – Traditional TCP 292 – Indirect TCP – Snooping TCP, Mobile TCP – Fast retransmit/ Fast Recovery – Transmission / Timeout freezing, Selective Retransmission – Transaction Oriented TCP

UNIT V **[15 Hours]**

Support for Mobility – File Systems – Consistency – Coda – little work – Ficus – Mio-NFS – Rover – World wide web – Hypertext transfer protocol – Hypertext Markup language – Some approaches that might help wireless access – System Architecture – Wireless Application Protocol – Architecture – Wireless datagram protocol – Wireless transport layer security – Wireless transaction protocol – Wireless session protocol – Wireless application environment – Wireless markup language – WML Script – Wireless Telephony application – Push Architecture – Push/Pull Services – I-mode – Sync- WAP 2.0.

Text Book

1. Jochen schiller, **Mobile Communications** , Second Edition , published by Dorling Kindersley Pvt. Ltd., Pearson Education in South Asia,2007.
2. William Stallings, **Wireless Communication And Networks**, *Pearson Education, New Delhi,2003*

References

88700128. William C.Y.Lee, **Mobile Communication Design Fundamentals**, John Wiley sons publishers, New Delhi 1993.

88700129. Singhal, **WAP-Wireless Application Protocol**, Pearson Education, New Delhi, 2003.

CORE XIII - OPTIMIZATION TECHNIQUES

(For those who joined since 2018-19**)**

Semester : IV **Hours/week: 6**

Code : GMITC41 **Credit : 5**

Course Outcomes:

CO 1: Understand the need of using operations research- a quantitative approach for effective decision making

CO 2: Interpret the solution of an LP model

CO 3: Convert an LP problem into its standard form by adding slack, surplus and/or artificial variables
CO 4: Apply the Hungarian method to solve an assignment problem
CO 5: Handle the problem of degenerate and unbalanced transportation problem
CO 6: Differentiate PERT and CPM

UNIT I **[15 Hours]**

Introduction: Operations Research – A quantitative perspective to decision making-History—Definitions-Features-OR approach to problem solving-Models and modelling –Methods for solving OR models-Methodology -Applications-Computer Software for Operations Research

Linear Programing: Structure of LP model-Advantages of using LP-Limitations-Applications-General Mathematical model of LPP-Guidelines on LP model formulation-Examples

Graphical Method: Important definitions-Graphical Solution methods of LP problem-Special cases in LP

UNIT II **[15 Hours]**

Linear Programming: Simplex method-Introduction-standard form of an LP problem-simplex algorithm (maximization case) - simplex algorithm (minimization case)-some complications and their resolution-types of LP solutions

UNIT III **[15 Hours]**

Duality in LP: Introduction- Formulation of Dual LP Problem

Assignment Problem: Introduction-Mathematical model of AP-Solution Methods of AP-Variations of the AP-Travelling Salesman Problem

UNIT IV **[15 Hours]**

Transportation Problem: Introduction-Mathematical model of TP-Transportation Algorithm-Methods of Finding Initial Solution-Test for Optimality-Variations in TP-Maximization TP--Unbalanced TP

UNIT V **[15 Hours]**

Project Management: PERT and CPM: Introduction-Basic Difference Between PERT and CPM-Phases of Project Management-Pert/CPM Network Components and Precedence Relationships-Critical Path Analysis-Project Scheduling with Uncertain Activity Times-Project Time-Cost Trade-Off-Resource Allocation

Text Book

1. J K Sharma, **Operations Research Theory and Applications**, Fifth Edition,MacMillan Publishers India Ltd,New Delhi,2013

References

2. Kanti Swarup , P.K. Gupta and Man Mohan, **Operations Research,** Sultan Chand & Sons publishers, 13th Edition, 2004
3. V.K.Kapoor, **Operations Research**, Sultan Chand & Sons Publishers,New Delhi,4th Edition, 2001
4. Hamdy A.Taha, **Operations Research**, Prentice Hall of India Pvt Ltd, New Delhi,7th edition, 2005

CORE XIV – CLOUD COMPUTING

(For those who joined since 2018-19)

Semester : IV **Hours/week: 6**
Code : GMITC42 **Credit : 5**
Course Outcomes:

CO 1: Strengths and limitations of cloud computing
CO 2: Identify the architecture, infrastructure and delivery models of cloud computing
CO 3: Study virtualization concept
CO 4: Address the core concepts of cloud computing
CO 5: Explain the core issues of the cloud computing
CO 6: Analyse various cloud programming models

UNIT I **[15 Hours]**

Introduction to Cloud Computing: Cloud Computing in a Nutshell - Roots of Cloud Computing - Layers and Types of Clouds - Desired Features of a Cloud - Cloud Infrastructure Management - Infrastructure as a Service Providers - Platform as a Service Providers.

Migrating into a Cloud: Introduction - Broad Approaches to Migrating into the Cloud - The Seven-Step Model of Migration into a Cloud.

UNIT II **[15 Hours]**

Enriching the 'Integration as a Service' Paradigm for the Cloud Era: An Introduction - The Evolution of SaaS - The Challenges of SaaS Paradigm- Approaching the SaaS Integration Enigma - The Integration Methodologies - SaaS Integration Products and Platforms - SaaS Integration Services - SaaS Integration Appliances.

The Enterprise Cloud Computing Paradigm: Introduction - Issues for Enterprise Applications on the Cloud - Enterprise Cloud Technology and Market Evolution - Business Drivers toward a Marketplace for Enterprise Cloud Computing - The Cloud Supply Chain.

UNIT III **[15 Hours]**

Virtual Machines Provisioning and Migration Services: Introduction and Inspiration - Virtual Machines Provisioning and Manageability - Virtual Machine Migration Services - VM Provisioning and Migration in Action - Provisioning in the Cloud Context.

On the Management of Virtual Machines for Cloud Infrastructures: The Anatomy of Cloud Infrastructures - Distributed Management of Virtual Infrastructures – Scheduling Techniques for Advance Reservation of Capacity - Capacity Management to meet SLA Commitments

UNIT IV **[15 Hours]**

Aneka—Integration of Private and Public Clouds: Introduction - Technologies and Tools for Cloud Computing - Aneka Cloud Platform - Aneka Resource Provisioning Service - Hybrid Cloud Implementation.

Comet Cloud: An Autonomic Cloud Engine: Introduction – Comet Cloud Architecture - Autonomic Behaviour of Comet Cloud - Overview of Comet Cloud-based Applications.

UNIT V **[15 Hours]**

Workflow Engine for Clouds: Introduction - Background - Workflow Management Systems and Clouds - Architecture of Workflow Management Systems - Utilizing Clouds for Workflow Execution.

The MapReduce Programming Model and Implementations: Introduction - MapReduce Programming Model - Major MapReduce Implementations for the Cloud - MapReduce Impacts and Research Directions.

Text book:

1. Rajkumar Buyya, James Broberg, Andrzej M.Goscinski, **"Cloud Computing : Principles And Paradigms"**, Wiley, First Edition, 2011.

Reference Books:

2 Nikos Antonopoulos, Lee Gillam, **"Cloud Computing: Principles, Systems and Applications"**, Springer, Second Edition, 2012.

3. Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, "**Mastering Cloud Computing",** Tata McGrawHill, First Edition, 2013.

4. Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, "**Cloud Computing Concepts, Technology & Architecture"**, Prentice Hall, First Edition, 2013.

CORE XV - PROJECT

(For those who joined since 2018-19**)**

Semester : IV
Code : GMITC43PW **Credits: 5**
Course Outcomes:
CO 1: Identify goals, constraints, deliverables, performance criteria and resource requirements in consultation with stakeholders
CO 2: Analytically collect requirements, plan, analyze, design, construct and test the code
CO 3: Document the various aspects of software development
Students have to undergo an individual project work either on campus or in an industry and appear for the viva voce examination with the software developed and document prepared by them

B Sc INFORMATION TECHNOLOGY

(Three Years Regular Programme)
(For those who joined since 2018-19)

Programme Specific Outcome

PSO 1: Use and apply current technical concepts and practices in the core information technologies
PSO 2: Skill to possess a product or process in problem solving, programming, databases project management to grasp business concepts and technical communications.
PSO 3: Expertise to effectively integrate IT-based solutions for understanding the internet, web technologies and to develop ethical, legal and healthy social networking into the user

PROGRAMME STRUCTURE

Sem	Part	Subject Code	Course	Subject Title	Hrs/wk	Credit	CIA Mark	ESE Marks	Total Mark
I	I	GBLT11/ GBLA11/ GBLIA11/ GBLH11	Language I	Tamil I / Basic Arabic I/ Intermediate Arabic I/ Hindi I	6	6	40	60	100
	II	GBLF12/ GBLG12	Language II	Functional English I / General English I	6	6	40	60	100
	III	GBITC11	Core I	Principles of Information Technology	5	4	40	60	100
		GBITC12P	Core II	Multimedia Lab (Photoshop & Macromedia Flash)	5	4	40	60	100
		GBITA13	First Allied I	Accounting Principles and Practice	4	3	40	60	100
		GBITA14P	First Allied II	Accounting Package Lab	2	2	40	60	100
	IV	GBITE15P	Skill Based Elective	Office Automation Lab	2	2	-	50	50
				Total	***30***	***27***	***240***	***410***	***650***
II	I	GBLT21/ GBLA21/ GBLIA21/ GBLH21/	Language I	Tamil II/ Basic Arabic II/ Intermediate Arabic II/ Hindi II	6	6	40	60	100
	II	GBLF22/ GBLG22	Language II	Functional English II / General English II	6	6	40	60	100
	III	GBITC21	Core III	Data Structures using C Language	4	3	40	60	100

		GBITC22P	Core IV	Programming in C Lab	4	3	40	60	100
		GBITA23	First Allied III	Cost and Management Accounting	4	3	40	60	100
		GBITA24P	First Allied IV	Inventory Package Lab	2	2	40	60	100
	IV	GBITE25P	Skill Based Elective	Linux and Shell Programming Lab	2	2		50	50
		GBES2	General Interest Course I	Environmental Studies	2	2	-	50	50
	-	GBITX2 / GBITX2O	Extra Credit	Photoshop / *Online Certification		2		100	100
				Total	***30***	***27+2***	***240***	***460+100***	***700+100***

III	III	GBITC31	Core V	Mathematics for Computer Science I	5	4	40	60	100
		GBITC32	Core VI	Object Oriented Programming in C+	4	2	40	60	100
		GBITC33P	Core VII	Programming in C++ Lab	3	2	40	60	100
		GBITA34	Second Allied I	Digital Electronics	4	3	40	60	100
		GBITA35P	Second Allied II	Digital Electronics Lab	2	2	40	60	100
	IV	GBITE36P	Skill Based Elective	PHP Lab	3	2		50	50
			Non-Major Elective		4	2		50	50
		GBHR3	General Interest Course II	Human Rights	3	2		50	50
	V	GBXTN3	Extension Activities	NSS/CSS	2	2	100	-	100
	-	GBITX3P / GBITX3O	Extra Credit	Design and Drafting Lab(AutoCAD Lab) / *Online Certification		2		100	100
				Total	***30***	***21+2***	***300***	***450+100***	***750+100***
IV	III	GBITC41	Core VIII	Mathematics for Computer Science II	6	4	40	60	100
		GBITC42P	Core IX	RDBMS Lab	4	4	40	60	100
		GBITC43	Core X	RDBMS	5	4	40	60	100
		GBITA44	Second Allied III	Microprocessor	4	3	40	60	100
		GBITA45P	Second Allied IV	Microprocessor Lab	2	2	40	60	100
	IV	GBITE46P	Skill Based Elective	Software Development Framework Lab (ASP.NET)	3	2		50	50
		GBVE4	General Interest Course III	Values and Ethics	2	2		50	50

			Non-Major Elective		4	2		50	50
	-	GBITX4 / GBITX4O	Extra Credit	Multimedia / *Online Certification	-	2		100	100
				Total	***30***	***23+2***	***200***	***450+100***	***650+100***

V	III	GBITC51P	Core XI	Programming in Java Lab	4	3	40	60	100
		GBITC52	Core XII	Programming in Java	4	3	40	60	100
		GBITC53	Core XIII	Operating System	5	4	40	60	100
		GBITE5A / GBITE5B	Elective I	a) Enterprise Resource Planning / b) Complier Design	5	5	40	60	100
		GBITE5C / GBITE5D	Elective II	a) Web Services / b) E-Commerce	5	5	40	60	100
	IV	GBITE54P	Skill Based Elective	Visual Programming Lab	3	2		50	50
		GBWS5	General Interest Course IV	Women Studies	3	2		50	50
	-	GBITX5 / GBITX5O	Extra Credit	Visual Programming / *Online Certification		2		100	100
				Library/Browsing	1				
				Total	***30***	***24+2***	***200***	***400+100***	***600+100***
VI	III	GBITC61	Core XIV	Software Engineering	5	4	40	60	100
		GBITC62	Core XV	Computer Networks	5	4	40	60	100
		GBITC63	Core XVI	Computer Graphics	4	4	40	60	100
		GBITC64PW	Core XVII	Project	6	4	40	60	100
		GBITE6A / GBITE6B	Elective III	a) Organizational Behaviour / a) b) Ethical Hacking	5	5	40	60	100
	IV	GBITE65P	Skill Based Elective	Open Technology Lab (Python)	3	2		50	50
	-	GBITX6	Extra Credit	Skills for Employability Development		2	100		100
				Library/Browsing	2				
				Total	***30***	***23+2***	***200 +100***	***350***	***550 +100***
				Grand Total	***180***	***145 +10***	***1380 +100***	***2520 +400***	***3900 +500***

***** For Online certification, credit alone will be assigned on submission of certificate obtained through appearing for Online Examination from edX, Swayam, Spoken Tutorial, NPTEL or Coursera, etc approved by the department

CORE I- PRINCIPLES OF INFORMATION TECHNOLOGY

(For those who joined since 2018-19)

Semester : I **Hours/ week: 5**

Subject Code: FBITC11/GBITC11 **Credits : 4**

Course Outcomes:

CO 1: Know the generation of computers and various I/O devices
CO 2: Understand about new developments in the digital communication and Networks
CO 3: Obtain knowledge in distributed system and World Wide Web
CO 4: Know the usage of different storages and applications of computers

UNIT I **[15 Hours]**

Computer System : Introduction-The First electronic Computers-Low-Level Languages-High-Level Languages- High-Level Languages- The first commercial Computers-Inside a Typical Computer System-The peripheral devices-Speeding up the System-The Emergence of CISC-What is RISC- The Advantages of RISC-Hazards of RISC- **Input Devices:** Introduction-Keyboard-Mouse-Trackball-Digitizing Tablet-Scanners-Digital Camera- Bar Code Reader-Speech Input Devices- -Light Pen-**Output Devices:** Monitor-Classification Of Monitors-Characteristics of a Monitor- Video Standards- VGA-SVGA-XGA-Printer-Plotter-Sound Cards & Speakers-3D-Audio

UNIT II **[15 Hours]**

General Software Features and Trends: Introduction – Ease of Use-Requirements Of more Powerful Hardware-Mail Enabling - **Introduction to Telecommunications:** Introduction- Analog & Digital signals-Modulation- Types of Modulation- Pulse Modulation Techniques- Digital Modulation – Modems-**Computer Networks:** Introduction – Overview of Network- Communication Processors- Communication Media- Types of Networks –Network Topologies- Network Protocols- Network Architecture

UNIT III **[15 Hours]**

Communication Systems: Introduction- Radio- Television – Microwave Systems- Communication Satellites- Radar- Fibre Optics-ISDN- **Distributed Systems:** Introduction-Distributing the processing and storage Functions- Advantages & Disadvantages of Distributed Systems- **Internet and Worldwide Web:** Introduction-What Special about Internet-Internet Access- Internet Basics-Internet Protocols- Internet Addressing- The WWW- Web Pages .**Electronic Mail:** Introduction- Mailing Basics- E-Mail Ethics-Spamming- E-Mail Advantages & Disadvantages- Newsgroups-**Intranets:** Introduction-Characteristics of Intranet-Advantages of Intranets- Business Benefits of Intranets- Drawbacks of Intranets- -Intranet vs. Groupware- Extranet

UNIT IV **[15 Hours]**

Introduction To Multimedia: Introduction – Multimedia in Entertainment- Multimedia in Software Training- Multimedia in Education and Training- Multimedia on the Web- Multimedia in Office Work-– Paint & Draw Applications. **Virtual Reality-** Introduction – Basic History of Virtual Reality – What Does Future Hold for Virtual Reality-**Electronic Commerce:** Introduction – Business-to-Business E-Commerce-The virtual Shop-The digital Middleman- What kind of E-commerce to use-**Hypermedia:** Introduction – Characteristics of Hypermedia- The Components of Hypermedia- Hypermedia Applications-**Data Warehouses and Data Marts:** Introduction-Advantageous of Data Warehouse-Data Warehouse Components- Structure of a Data Warehouse- Uses of a Data Warehouse- Interface with other Data Warehouses

UNIT V **[15 Hours]**

On-Line Analytical Processing (OLAP): Introduction- OLAP and Data Warehousing-Uses of OLAP-OLAP Benefits-**Geographic Information System (GIS):** Introduction- Components of GIS- How GIS Works?- GIS and Related Technologies- What can GIS do for you – GIS is Everyday Life-**Computers in Business and Industry:** Introduction – Office Automation- People- Ergonomics- Office Automation Technologies- Office Automation Systems-**Computers in Home:** Introduction – Household Business-Business Applications at Home – Smart Cards – Communication, Education and Information- Home Entertainment Refined- Creativity and Leisure-**Computers in Education and Training:** Introduction –

Literacy- Computer in Schools- Programming Tools- Productivity Tools- Authoring Tools for Students - Computer in Entertainment, Science, Medicine and Engineering

Text Book

1. Alex Leon, Mathews Leon, **Fundamentals of Information Technology**, Tata McGraw Hill Education, New Delhi, Fourth Edition, 2007

References

2. Raja Raman, **Computer Fundamentals**, Prentice Hall India Pvt Limited, New Delhi, 2003

3. Bethesda MD, **Planning for Integrated Academic Information Management Systems**, Proceedings of a symposium sponsored by the National Library of Medicine, 1984, The Library, 1985

4. Lorenzi NM, Riley RT, **Organizational Aspects of Health Informatics**, Springer-Verlag: Managing Technological Change, New York, 1995

CORE II- MULTIMEDIA LAB (PHOTOSHOP & MACROMEDIA FLASH)

(For those who joined since 2018-19)

Semester : II **Hours/week : 5**

Subject Code: GBITC12P **Credits : 4**

Course Outcomes

CO 1: Understand the tools for editing image like change colors, retouching, correcting mistakes and alter images for advertising or publication

CO 2: Know how to design layouts for web pages, Paper Advertisements, Brouchers, CD Covers, Banners Albums, Pop Ups and etc

CO 3: Use different tools of flash player to create an effective animated picture to analyse the role of art in animation and graphics

CO 4: Understand how to combine multiple pictures and use them to animate for a specified duration

PHOTOSHOP

Converting the image

1. Convert the picture into pencil drawing
2. Convert any one of the bird black and white in a given picture
3. Design a picture and change the mode of the picture
4. Design an image and change the image size, canvas size and rotate the canvas to 90 degree

Tools

5. Design a picture and use the following tools

i) blur ii) dodge iii) sponge iv) burn v) sharpen

6. Design a picture using lasso tool
7. Design an advertisement using text tool and lasso tool
8. Create your own water color by mixing a variety of colors using smudge tool

Special Effects

9. Design scenery using special effect brushes
10. Design a picture and give the following effects

i) wind ii) water paper iii) glowing edges iv) grain v) mosaic tiles

11. Design a birthday card using lighting effect

Layers

12. Using layers hide and display the parts of the picture

Text effect

13. Design a visiting card containing at least one graphics and apply the shadow emboss for text information
14. Design a banner using clone stamp tool and Text effect
15. Design your visiting card using text effect

MACRO MEDIA FLASH

Keyframes

1. Animate the stages of burning candle
2. Animate a Clock
3. Animate a Doll Movement

Motion Tween

4. Draw a bird to lay egg and to hatch it with animation
5. Draw the multicolored fishes that jumps in and out of water in the tank
6. Draw the Natural Scenery along with the movement of bird
7. Display the Ball bouncing
8. Animate the Life Cycle of the Butterfly
9. Animate the scene "Tree growing from the seed"
10. Animate the scene "Leaves falling down from the tree"
11. Animate Kite which is flying in an irregular path
12. Animate a wheel rolling down on an irregular path
13. Display an animated greeting card
14. Illustrate the working of solar System
15. Create a cartoon movie

Note: - Questions for the Internal/External examination will be based on the concepts learnt

CORE III- DATA STRUCTURES USING C LANGUAGE

(For those who joined since 2018-2019 onwards)

Semester : II **Hours/week: 4**

Subject Code: FBITC211/GBITC21 **Credits : 3**

Course Outcomes:

CO 1: Overview of C Language and its structure

CO 2: Different types of data structures, Linked List and its operation

CO 3: Get familiarity with Stack, Queue, Tree and its operations

CO 4: Understand the concept of graph data structure and its traversal and to learn the different types of searching and sorting techniques

UNIT I **[12 Hours]**

Introduction - Overview of C - Sample program - Constants - Variables - Data Types - Input and Output Operations - Operator and Expressions - Control Statements

UNIT II **[12 Hours]**

Arrays - Strings - Built-in Functions - User defined Functions - Structures - Unions – Pointers

UNIT III **[12 Hours]**

Introduction to Algorithms and Data Structures: Introduction to Algorithm - Asymptotic Notation - Introduction to Data Structures - Types of Data Structures - Data Structure Operations

Linked Lists: Introduction to Linked list - Basic concept - Linked list Implementation - Types of Linked Lists – Circular Linked List - Doubly Linked List

UNIT IV **[12 Hours]**

Stacks: Introduction to Stacks – Stack Operations – Stack Implementation.

Queues: Introduction of Queues – Queues-Basic concepts – Queue Operations – Queue Implementation.

Trees: Introduction to Trees – Basic Concepts – Binary Tree - Binary Tree Representations – Binary Tree Traversal - Binary Search Tree

UNIT V **[12 Hours]**

Graphs: Introduction – Basic Concept – Graph Terminology – Graph Traversal

Sorting and Searching: Introduction - Sorting Techniques – Searching Techniques

Text Book

1. E Balagurusamy, **Data Structures using C**, McGraw Hill Education (India) Private Limited, 2013

References

2. Reema Thareja, **Data Structures Using C**, Second Edition, Oxford University Press, 2014
3. Aaron M. Tenenbaum, **Data Structures Using C**, First Edition, Pearson, 1998

CORE IV - PROGRAMMING IN C LAB

(For those who joined since 2018-19)

Semester : II **Hours/week: 4**
Subject Code: FBITC22P/GBITC22P **Credit : 3**

Course Outcomes

CO 1: Understand programming concept and its roles in problem solving
CO 2: Enhance the debugging skills
CO 3: Understand and differentiate decision making and looping structure
CO 4: Practical Implementation and testing of basic data structures in C language

PROGRAM LIST

Formula substitution

1. Write a C Program to check whether the given number is odd or even
2. Write a C Program to find sum of the digits and reverse the digits
3. Write a C Program to generate the Fibonacci series
4. Write a C Program to check whether given number is prime or not
5. Write a C Program to generate Prime number within range
6. Write a C Program to find whether a given number is Armstrong or not
7. Write a C Program to find whether a given number is perfect or not
8. Write a C Program to find whether the given number is palindrome or not
9. Write a C Program to count the number of positive, negative and zero in the list
10. Write a C Program to calculate standard deviation
11. Write a C Program to convert Binary to decimal and vice versa
12. Write a C Program to solve the Quadratic Equation
13. Write a C Program to find the area of various shapes using switch case

Array

14. Write a C Program to Find Matrix Addition , Subtraction, Multiplication and Transpose of a matrix using switch case
15. Write a C Program to Check whether the element is present in the given list or not
16. Write a C Program to sort numbers in ascending and descending order
17. Write a C Program to sort names in Alphabetical order

Functions & Structures

18. Write a C Program to find the factorial of a given number using function declaration
19. Write a C Program to find the factorial of a given number using recursion function
20. Write a C Program to Prepare student mark list using structure
21. Write a C Program to Prepare electricity bill using structure

String Manipulation

22. Write a C Program to count the vowels in the given string
23. Write a C Program to convert the case of given string from upper case to lower case and vice versa

Pointers

24. Write a C Program to sort numbers in ascending order using pointers
25. Write a C Program to find average of two numbers using pointers

Data Structures

26. Write a C Program to perform push and pop operations on stack
27. Write a C Program to perform following operations on queue

i) Insert an element
ii) Delete an element
iii) Display the queue.

28. Write a C Program to implement singly Linked list with following operations
i) Insert and delete an element at font
iii) Insert and Delete an element at end

Note:-Questions for Internal and External examination will be based on concept learnt

CORE VI - OBJECT ORIENTED PRIGRAMMING IN C++

(For those who joined since 2018-19)

Semester : III **Hours/week: 4**
Subject Code : FBITC32/GBITC32 **Credits : 2**

Course Outcomes:

CO 1: Understand the OOPs concepts and the usage of control structures
CO 2: Usage of Class, object and functions
CO 3: Understand C++ features such as Constructors, Destructors, Operator overloading, Inheritance, Pointers and Polymorphism
CO 4: Work with files, templates and to handle exception.

UNIT I **[12 Hours]**

Object – Oriented Programming Paradigm: Basic Concepts of Object Oriented Programming- Benefits of OOPs-Object Oriented languages-Application of OOPs-**Beginning with C++:** Tokens, **Expressions and Control Structure**

UNIT II **[12 Hours]**

Functions in C++: Introduction- The main function- Function prototyping- Call by Reference- Return by Reference- Inline Functions- Default Arguments- Const Arguments- Function and Virtual Functions- Math Library Functions.

Classes and Objects: Introduction-Specifying a Class-Defining Member Functions-A C++ Program with Class- Making an Outside Function Inline- Nesting of Member Functions-Private Member Functions-Array within a Class- Memory Allocation for Objects-Static Data Members-Static Member Functions-Array of Objects-Objects as Function Arguments, Friendly Functions- Returning Objects- Const Member Functions

UNIT III **[12 Hours]**

Constructor and Destructors: Introduction-Constructors-Parameterized Constructors-, Multiple Constructors in a Class - Constructors with Default Arguments-Dynamic Initialization of Objects-Copy Constructor-Dynamic Constructors- Constructing Two-Dimensional Arrays-Destructors. **Operator Overloading and Type Conversion:** Introduction - Defining Operator Overloading – Overloading Unary, Binary Operators – Rules for Overloading Operators

UNIT IV **[12 Hours]**

Inheritance: Introduction- Defining Derived Class- Single Inheritance- Making Private Member Inheritable- Multilevel Inheritance-Multiple Inheritance-Hierarchical Inheritance-Hybrid Inheritance-Virtual Base Class-Abstract Classes- Constructors in Derived Classes- Member Classes: Nesting of Classes. **Pointers, Virtual Functions and Polymorphism:** Introduction - Pointers to Objects-this Pointer-Pointer to Derived Classes- Virtual Functions-pure Virtual functions

UNIT V **[12 Hours]**

Working with files: Introduction – classes for file stream operations- opening and closing a file – Detecting End of file – more about open (): File modes **Templates**: introduction – class Templates – class templates – class templates with multiple parameters-function templates – function templates with multiple parameters **Exception Handling**: Introduction- Basics of Exception Handling – Exception Handling Mechanism- throwing Mechanism-catching mechanism

Text Book

1. E.Balagurusamy, **Object oriented Programming With C++**, Tata McGraw-Hill Publishing Company Limited, New Delhi,Fourth Edition, 2008

References
2. Ivor Horton, **Beginning C++ - The Complete Language**, Shroff Publishers and Distributors Pvt.Ltd, Mumbai, 2007
3. Venugopal K R, Rajkumar B, and RaviShankar T, **Mastering C++,** Tata McGraw Hill, New Delhi, Fifth Reprint, 2006

CORE VII - PROGRAMMING IN C++ LAB

(For those who joined since 2018-19)

Semester : III **Hours / Week: 3**
Subject Code: FBITC33P/GBITC33P **Credits : 2**

Course Outcomes
CO 1: Apply C++ features to program design and implementation
CO 2: Able to reuse the class using Inheritance
CO 3: Able to create file
CO 4: Know to handle exception

Formula Substitution
1. Write a C++ program to check a given number is odd or even
2. Write a C++ program to check a given number is palindrome or not using class
3. Write a C++ program to check a given number is armstrong or not using class
4. Write a C++ program to sort the list of numbers using class

Functions
5. Write a C++ program to check a given number is positive or negative using function
6. Write a C++ program to find sum of digit using nesting of member function
7. Write a C++ program to demonstrate unary operator using friend function

Constructors
8. Write a C++ program to find reverse of digit using constructor

Overloading
9. Write a C++ program to find area of shapes using function overloading
10. Write a C++ program to add two complex numbers using binary operator overloading

Inheritance
11. Write a C++ program to perform student mark list using single inheritance
12. Write a C++ program to prepare electricity bill using multilevel inheritance

Pointer
13. Write a C++ program to searching an element in the list using pointer
14. Write a C++ program to checking a given number is prime or not using pointer to object

File Handling
15. Write a C++ program to create a new files to store content and display number of words in the files

Exception Handling
16. Write a C++ program to demonstrate user defined exception

Note: - Questions for Internal and External examination will be based on concept learnt

SECOND ALLIED I- DIGITAL ELECTRONICS

(For those who joined since 2018-19)

Semester : III **Hours/week: 4**
Subject Code : FBITA34/GBITA34 **Credits : 3**
Course Outcomes:
CO 1: Understand the number system and codes
CO 2: Understand simplification of Boolean, logic gates and circuits
CO 3: Obtain knowledge on registers
CO 4: Differentiate between ROM and RAM

UNIT I **[12 Hours]**
Number Systems and Codes: Introduction- binary, octal, decimal, and hexadecimal number system- decimal to binary, octal to binary, hexadecimal to binary – hexadecimal to octal conversions and vice

versa-binary arithmetic-1s and 2s complement representations-BCD addition and subtraction-weighted and un- weighted codes- alphanumeric codes

UNIT II **[12 Hours]**

Basic Boolean functions: AND,OR,NOT Functions- Boolean theorems and laws-use of Boolean algebra for simplification of logical expressions- minterm and maxterm- canonical sum of products and product of sum simplifications- minimization of logical expressions using K-map-logic gates- AND,OR,NOT,EX-OR,NAND,NOR gates-realisation of logic functions

UNIT III **[12 Hours]**

Introduction to combinational logic circuits : arithmetic circuits –half adder, full adder, half subtractor, full subtractor, parallel binary adder - subtractor, serial adder, multiplier and divider-encoder, decoder

UNIT IV **[12 Hours]**

Introduction to sequential circuits-flipflops-SR,JK,D and T flipflops-master-slave flipflops-level and edge triggering-synchronous and asynchronous counters- up/down counters- modulo-n- counters- shift registers- serial in serial out-serial in parallel out,parallel in serial out and parallel in parallel out shift counters- ring counters

UNIT V **[12 Hours]**

Read only memory- architecture of ROM, PROM, EPROM, EEPROM, ROM applications-RAM- RAM architecture-static and dynamic RAM

Textbook

1. S.Salivahanan and S. Arivazhagan, **Digital circuits and Design**, Vikas Publishing house, New Delhi,2000

References

2. Morris M.Mano, **Digital logic and Design**, Prentice Hall Publishing, New Delhi, 1999
3. Malvino and Leach, **Digital Principles and Applications**, Cambridge University Press , New Delhi,Fourth Edition,1988

SECOND ALLIED II- DIGITAL ELECTRONICS LAB

(For those who joined since 2018-19)

Semester : III **Hours/week: 2**
Subject Code : FBITA35P/GBITA35P **Credits : 2**

Course Outcomes:

CO 1: Implement logic functions
CO 2: Able to build circuits, truth tables, and Boolean algebra expressions
CO 3: Apply the laws of Boolean algebra to simplify circuits and Boolean algebra expressions
CO 4: Implement combinational logic circuits

Logic Gates

1. Verification of AND Gate using ICs
2. Verification of OR Gate using ICs
3. Verification of NOT Gate using ICs
4. Verification of NAND Gate using ICs
5. Verification of NOR Gate using ICs
6. Verification of EX-OR Gate using ICs

Universal Gates

7. Universality of NAND gates using IC 7400
8. Universality of NOR gates using IC 7402

Boolean algebra and Theorem

9. Verification of Boolean Expression using ICs
10. Verification of Demorgan's theorems using ICs

Combinational Logic Circuits

11. Binary half and full adder using ICs

12. Binary half and full subtractor using ICs

Diodes Characteristics

13. V-I Characteristics of a PN junction diode
14. V-I Characteristics of a Zener diode

Note: - Questions for Internal and External examination will be based on concept learnt

CORE IX-RDBMS LAB

(For those who joined since 2018-19)

Semester :IV **Hours/week: 4**
Subject Code : FBITE541/ GBITC42P **Credits : 4**

Course Outcomes

CO 1: Create and manipulate data using DDL, DML and TCL queries

CO 2: Enhance skills in implementing constraints in tables

CO 3: Know to create block structure programming language

CO 4: Implement procedures, exceptions, triggers in PL/SQL block

SQL LAB LIST

DDL

1. Create an address table with fields name , doorno , street & city
   - describe its structure
   - alter the table to include pincode
   - alter the table to modify street column
   - drop the table

DML

2. Create a student table with regno, name, age and dept.
   - insert records
   - delete the students with age above 20
   - truncate and drop the table

Functions

3. Create an employee table with fields eno , ename , sex ,age & years of experience
   - find out the no. of female employees
   - find out the employees with age ranging between 30 and 35
   - list out the employees who are working more than 5 years
4. Create a library file with fields accno,title,author,cost & no of copies
   - Arrange the books according to accno
   - Find out the total no. of books available in the library
   - Find out the book of minimum cost
5. Create a player table with fields name,sports(cricket,hockey,etc.),age & country
   - find out the eldest and youngest player
   - group players according to sports
   - list out the Indian players
6. Write the SQL queries to illustrate all number functions
7. Write the SQL queries to illustrate date functions
8. Write the SQL queries to illustrate all string functions
9. Create an item table with field's itemno, itemname, quantity & price and insert records. Illustrate the comparison operators (between, like, in & isnull)
10. Create a table with the fields clientno , clientname & phoneno Illustrate the set operators union , unionall, minus & intersect
11. Create a student table with fields' regno, name, English, Tamil, Maths and Total & insert records
    - Arrange all records according to Total
    - Find the student who got first mark in Maths
    - List out the students whose name starts with 'S'
12. Create an inventory table with fields' itemno, itemname, qnty, price and reorderlevel

insert records

- update the qnty when it goes less than reorderlevel
- list the items with price less than 100

13. Create an employee table with fields ecode,ename,age & salary and create a department table with fields ecode, designation, deptcode & dept. Illustrate joins and sub queries using the above tables.

Constraints

14. Create a vendormaster table with fields vencode,venname,place and phoneno
Create a ordermaster table with fields itemno,itemcode,vencode,qnty and orderdate .
Illustrate the following constraints using the above tables

- vencode as primary key in vendormaster
- vencode as foreign key in ordermaster
- phoneno as unique
- place as notnull &
- qnty > 100

TCL

15. SQL queries to illustrate TCL commands (savepoint, rollback and commit)

PL / SQL LAB LIST

Formula Substitution

1. PL / SQL block to find out the largest among three numbers
2. PL/SQL block to print the multiplication table for given multiplier

Functions

3. Write a PL/SQL block to find the sum of digits of a given number. Use function.
4. Write a PL/SQL block to find the factorial of a given number using function.

Cursor

5. Create a library table with fields accno,title author and price & insert records, write a PL/SQL block to illustrate implicit cursor.

Procedure

6. Create a student table with fields regno,name, maths ,physics&biology and insert records ,write a PL/SQL block to find the total , average & grade using procedure
7. Create an electricity bill table with fields Custcode,custname, custtype, prevreading, currreading, units, costperunit & totalamount. write a PL/SQL block to find the total amount for all customers using the
following condition

Custtype	Costperunit
i.Domestic	Rs. 3 /-
ii.Office	Rs. 4/-
iii.Factory	Rs. 6/-

Exception Handling

8. Write a PL/SQL block to illustrate the following predefined exceptions
a) too_many_rows
b) no_data_found
9. Create a table with fields itemno, itemname, qntyordered & qntydelivered, write a PL/SQL block using userdefined exception to indicate when more items have been delivered than ordered

Triggers

10. Creating and executing triggers

Note: - Questions for Internal and External examination will be based on concept learnt

CORE X- RDBMS

(For those who joined since 2018-19)

Semester : IV **Hours / Week: 5**
Subject Code: FBITC521/ GBITC43 **Credits : 4**

Course Outcomes

CO 1: Basic concepts of DBMS and RDBMS
CO 2: Know about database design and transaction processing management
CO 3: Acquire knowledge about security in database
CO 4: Comparing Indexing and Hashing

CO 5: Understand the concept of Object Technologies
CO 6: Future scope of DBMS

UNIT I **[15 Hours]**

Introduction to Database Systems: Introduction - Database Management Systems (DBMS) - An Overview of Database Management - Brief introduction to SQL - Embedded SQL - Dynamic SQL.**The Relational Model:** Relational Databases Primer - Relational Database Characteristics - Relational Algebra - Relational Calculus - Database Integrity – Keys - Entity and Referential Integrity -Views

UNIT II **[15 Hours]**

Database Design: Design Considerations - Functional Dependency - Normalization and Normal Forms - Entity/Relationship (E/R) Modeling - **Transaction Processing and Management:** Transaction – Recovery - Transaction Models - Two-Phase Commit - Locking – Deadlocks

UNIT III **[15 Hours]**

Database Security: Threats and Risks – Cryptography - Digital Signature - Database Control - Users and Database Privileges - Types of Privileges - **Distributed Databases:** Distributed Database Concepts - Distributed Database Architectures - Advantages of Distributed Databases - Distributed Database Requirements - Distributed Database Techniques - Date's 12 Rules

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UNIT IV **[15 Hours]**

Indexing and hashing: Hash organization - Bit mapped Indexing – Static Hashing – Dynamic Hashing – Comparison of ordered indexing & Hashing - **Transactions:** Transaction concept – Transaction state – Implementation of Atomicity and Durability – Concurrent Executions – Recoverability

UNIT V **[15 Hours]**

Object Technology and DBMS: An Introduction to Object Technology – Abstraction – Encapsulation – Inheritance - Object Technology and RDBMS - **Advanced Topics in DBMS:** Internet and DBMS - Multimedia Databases - Digital Libraries - Mobile Databases

Text Book

1. Atul Kahate, **Introduction to Database Management Systems**, Pearson Education (Singapore) pvt Ltd, New Delhi,Tenth impression, 2012

References

2. Abraham Silberschatz, Henry Forth, S.Sudarshan, **Database System Concepts**, Tata Mc Graw Hill,New Delhi, Fifth Edition, 2006
3. C J Date , **An Introduction to Database System** , Addison- Wesley publishing company,New Delhi, Third Edition, 1998

SECOND ALLIED III- MICROPROCESSOR

(For those who joined since 2018-19)

Semester : IV **Hours/week: 4**
Subject Code : FBITA44/GBITA44 **Credits : 3**

Course Outcomes:

CO 1: Understand the basic concepts of 8088/8086 microprocessor, registers and addressing mode

CO 2: Acquire knowledge of instruction sets and programming structure

CO 3: Know the min & max mode interface signals, bus cycle and system clock

CO 4: Ability to explore architecture of 80386, 80486 Microprocessor and Pentium Microprocessor family

UNIT I **[15 Hours]**

Software Architecture of the 8088 and 8086 Microprocessors: Introduction – Micro architecture of the 8088/8086 Microprocessor- Software Model 8088/8086 Microprocessor- memory address space and data organization -Data types-Segment registers and Memory segmentation- Dedicated, reserved, and general use memory- Instruction Pointer- Data registers- Pointers and Index registers- Status Registers- Generating a Memory address- Addressing modes

UNIT II **[15 Hours]**

8086/8088 Programming: Instruction set of 8088/8086-Data Transfer, Arithmetic, Logic, Shift, Rotate instructions-Compare instructions- Control flow and Jump instructions-Loops and loop handling instructions- Strings and String handling instruction

UNIT III **[15 Hours]**

Memory Interfaces: Minimum mode and Maximum mode Systems**:** Minimum and Maximum system mode interface signals- System Clock-Bus Cycle-Memory Control signals-Read and Write Bus cycle-Memory Interface Circuits

UNIT IV **[15 Hours]**

I/O Interface: Types of I/O, Isolated Input/Output Interface- Input and Output data transfer- I/O instructions- Input and Output Bus cycles

UNIT V **[15 Hours]**

Interrupt Interface of the 8088 and 8086 Microprocessors: Interrupt mechanism, types, and priority-Interrupt Vector table- Interrupt instructions- Enabling/disabling of interrupts-External Hardware interrupt interface signals– 82C59A Programmable Interrupt Controller-Software Interrupts

Advanced Microprocessor: Introduction about 80386 Microprocessor family, 80486 Microprocessor family, and Pentium Microprocessor family

Text Book

1. Walter A.Triebel, Avtar Singh, **The 8088 and 8086 Microprocessors Programming Interfacing Software Hardware and Applications**, Prentice Hall Publication, NewDelhi,Fourth Edition, 2003

References

2. Aditya P.Mathur, **Introduction to Microprocessor**, McGraw Hill Publishing Company Ltd, NewDelhi,,Third Edition,1989
3. M.Refiquzzaman, **Microprocessor Theory and Application**, Prentice Hall of India, NewDelhi,Revised Edition, 1996
4. Gilmore, **Microprocessors Principles and Applications**, Tata McGraw Hill Publishing Company Ltd, NewDelhi, Second Edition, Second reprint, 1998

SECOND ALLIED IV- MICROPROCESSOR LAB

(For those who joined since 2018-19)

Semester : IV **Hours/Week : 2**
Subject Code : FBITA45P/GBITA45P **Credit : 2**

Course Outcomes:

CO 1: Able to solve basic binary operations

CO 2: Demonstrate programming proficiency using the various addressing modes and data transfer instructions

CO 3: Apply knowledge using internal registers

CO 4: Implement interface programs

8086 MICROPROCESSOR

Arithmetic Operations

1. Addition / Subtraction of 8/16 bit Data
2. Multiplication / Division of 8 bit Data

Formula Substitution

3. Smallest / Largest of N Numbers
4. Sum of Odd/Even Numbers
5. Factorial of a Number
6. Fibonacci Series

Binary Conversion

7. One’s complement and Two’s complement of given numbers

Array

8. To arrange in ascending / descending order

String Manipulation

9. Program for searching for a number or character in a string for 8086.
10. Program for String manipulations for 8086.

Interfacing

11. Program for digital clock design using 8086
12. Interfacing ADC to 8086
13. Interfacing DAC to 8086
14. Interfacing stepper motor to 8086

Note: - Questions for Internal and External examination will be based on concept learnt

CORE XI- PROGRAMMING IN JAVA LAB

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Subject Code : FBITC51P/GBITC51P **Credits : 3**

Course Outcomes:

CO 1: Hands on experience with the basics of java program

CO 2: Improve skills to develop multi-threaded programs

CO 3: Demonstrate Exception handling program

CO 4: Acquire skills to implement GUI components (Console and GUI based) and event-driven programming

PROGRAM LIST

Checking

1. Write a java program to check a given number is palindrome or not
2. Write a java program to check a given number is prime or not
3. Write a java program to check a given number is perfect or not

Generation

4. Write a java program to generate N Armstrong numbers
5. Write a java program to generate Fibonacci series

Methods

6. Write a java program to find factorial of a given number using method
7. Write a java program to find largest among two numbers using nesting of method
8. Write a java program to find area of different shapes using method overloading

Array

9. Write a java program to sort the list of numbers in ascending order
10. Write a java program to sort the list of names in alphabetical order
11. Write a java program to searching a number in the list
12. Write a java program to perform matrix multiplication

String Manipulation

13. Write a java program to perform string functions using switch-case

Constructor

14. Write a java program to find sum of digits using constructor

Inheritance

15. Write a java program to find area and volume of room using single inheritance
16. Write a java program to enumerate student details using Hierarchical inheritance

Applet

17. Write a java applet program to animate banner using thread
18. Write a java applet program to draw a human face
19. Write a java applet program to display an image
20. Write a java applet program to perform arithmetic operations
21. Write a java applet program to perform mouse events

22. Write a java applet program to perform key events

JFrame

23. Write a java jframe program to create user login form
24. Write a java jframe program to demonstrate arithmetic exception
25. Write a java jframe program to demonstrate menu
26. Write a java jframe program to store personal information to the database

Note: - Questions for Internal and External examination will be based on concept learnt

CORE XII- PROGRAMMING IN JAVA

(For those who joined since 2018-19)

Semester : V **Hours/Week: 4**
Subject Code: FBITC531/GBITC52 **Credit : 3**

Course Outcomes:

CO 1: Gain knowledge about basic Java language syntax and semantics to write Java programs

CO 2: Understand the fundamentals of OOPs

CO 3: Know principles of inheritance, packages and interfaces

CO 4: Acquire the knowledge of exception handling and applet programming

UNIT I **[12 Hours]**

Fundamentals of Object Oriented Programming: Introduction, object oriented paradigm – basic concepts of oops – benefits of oops – applications of OOPs**. Java Evolution:** java features –java Versus C and C++ - java and internet – java and WWW – web browsers – java environment –**Overview of Java Language**: simple java program - more of java – application with two classes –java program structure – java tokens – java statements-implementing a java program - java virtual machine - command line arguments

UNIT II **[12 Hours]**

Constants, Variables, data types: Declaration of variables- giving values to variables – scope of variables –symbolic constants – type casting – getting values of variables – standard default values – **Operators and Expressions**: Arithmetic operators –Relational operators- logical operators – assignment operators – increment and decrement operators –conditional operator – bitwise operator – special operators –arithmetic expressions –evaluation of expressions –precedence of arithmetic operators-type conversion in expression –operator precedence and associativity – mathematical functions.- **Decision making and Branching:** if statement –switch - ? : operator –**Decision Making and Looping:** while statement – do statement – for statement – jumps in loops - labeled loops

UNIT III **[12 Hours]**

Classes, Objects and Methods: Introduction – defining a class, field declaration–methods declaration – creating objects – accessing class members – constructors – methods overloading – static members – nesting of methods – inheritance – overriding methods – final variables and methods – final classes – finalizer methods – abstract methods and classes –visibility control - **Arrays Strings and Verctors** : one dimensional array – creating an array –two dimensional arrays –strings –vectors –wrapper classes – **Interfaces, Multiple Inheritance**: defining interfaces – extending interfaces –implementing interfaces – accessing interface variables

UNIT IV **[12 Hours]**

Packages , Putting classes together : Introduction - java API packages : using system packages – naming conventions –creating packages –accessing a package –using a package – adding a class to a package – hiding classes – **Multithreaded Programming** : creating threads – extending the thread class – stopping and blocking a thread - life cycle of a thread – using thread methods – thread exceptions –thread priority – synchronization –implementing the runnable interface

UNIT V **[12 Hours]**

Managing Errors and Exception: Introduction – types of errors –exceptions -syntax of exception handling code – multiple catch statements –using finally statement –throwing our own exceptions –using

exceptions for debugging- **Applet Programming:** introduction –how applets differ from applications – building applet code –applet life cycle – creating an executable applet –designing a web page - applet tag – adding applet to html file –running the applet – more about applet tags –passing parameters to Applets – aligning the display

Text Book

1. E. Balagurusamy, **Programming with Java- a primer**, Tata McGraw Hill Publishing Company Limited, NewDelhi,Third edition,2007

References

2. Herbert Schildt , **The complete Reference Java 2**, Tata McGraw- Hill publishing company Limited , NewDelhi,Fourth Edition,2002
3. Bruce Eckel, **Thinking in Java**, Pearson Education, New Delhi,Fourth Edition, 2006

CORE XIII- OPERATING SYSTEM

(For those who joined since 2018-19)

Semester : V **Hours / Week: 5**
Subject Code: FBITC43/GBITC53 **Credits : 4**

Course Outcomes:

CO 1: Understand the concepts of Operating system and able to use system calls

CO 2: Know what a process is and how process are synchronized and scheduled

CO 3: Understand different approaches of memory management and dead lock handling

CO 4: Provide knowledge of file management, storage, distributed system and Security

UNIT I **[15 Hours]**

Introduction: What is an Operating System -Mainframe systems- desktop systems- Multiprocessor Systems- Distributed systems- Clustered Systems- Real time systems- Hand held systems

Operating System Structure: System components- Operating System services- System calls- - System structure- Virtual machines

UNIT II **[15 Hours]**

Processes: Process concept- process scheduling- operations on processes- cooperating processes- Inter process Communication

CPU Scheduling: Basic Concepts- Scheduling Criteria- Scheduling algorithms **Process Synchronization**: Background- The critical system problem- semaphores- Classic problems of synchronization- Critical Regions- Monitors

UNIT III **[15 Hours]**

Deadlock: System Model-Deadlock Characterization- Methods of Handling Deadlock-Deadlock Prevention-Deadlock Avoidance- Deadlock Detection- Recovery from Deadlock

Memory management: Background- Swapping- Contiguous memory allocation- Paging- Segmentation- Segmentation with paging

UNIT IV **[15 Hours]**

Virtual memory: Background- Demand paging- process creation- Page replacement

File system interface: File concepts- access methods- Directory structure

Mass storage structure: Disk structure- Disk Scheduling- Disk management- Swap space management- RAID structure

UNIT V **[15 Hours]**

Protection: Goals of protection- domain of protection- Access matrix- Implementation of Access matrix- revocation of access rights

Security: The security problem- User authentication- Program threats- System threats- securing systems and facilities- Intrusion detection- Cryptography

Text Book

1. Silberschatz, Galvin, Gagne, **Operating System Concepts**, Wiley India Pvt. Ltd, NewDelhi,Sixth Edition, 2003

References

2. Milan Milenkovic, **Operating System Concepts & Design,** Tata, McGraw Hill Publishing Limited, NewDelhi,Second Edition,1997
3. Peter Baer Galvin and Robert Neilson Boyd, **Applied Operating system concepts**, John Wiley & Sons, NewDelhi, First Edition, 2000

4. Dhananjay M. Dhamdhere, **Operating System A Concept-Based Approach**, Tata McGraw Hill Publishing Limited, NewDelhi,Third Edition, 2012

CORE XIV- SOFTWARE ENGINEERING

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 5**
Subject Code: FBITC61/GBITC61 **Credit : 4**

Course Outcomes:

CO 1: Plan a software project

CO 2: Identify the requirement and analyse the cost

CO 3: Familiarity to implement code

CO 4: Ability to perform test, maintenance and to assure the quality of software

UNIT I **[15 Hours]**

Introduction: Introduction to software engineering – some definitions – some size factors-quality and productivity factors – managerial issues. **Planning a software project**: Defining the problem– planning the development process – planning an organizational structure

UNIT II **[15 Hours]**

Software Cost Estimation: software cost estimation techniques- estimating software maintenance costs
Software Requirements Definition: The software requirements specification- formal specification techniques

UNIT III **[15 Hours]**

Software Design: Fundamental design concepts –design notations-design techniques –test plan -design guidelines.
Software Implementation: Structured coding techniques – coding style

UNIT IV **[15 Hours]**

Software Testing: A Strategic approach to software testing – strategic issues – unit testing –integration testing - validation testing – system testing – the art of debugging
Software Maintenance: Enhancing maintainability during development- managerial aspects of software engineering-configuration management – source code metrics

UNIT V **[15 Hours]**

Software Quality Assurance: Quality concepts – software quality assurance- software reviews – formal technical reviews-statistical quality assurance-the SQA plan – the ISO 9000 quality standards

Text Book

1. Richard E. Fairley, **Software Engineering Concepts**, Tata McGrawHill Publishing Company Ltd, New Delhi,1985

References

2. Roger S. Pressman, **Software Engineering A Practitioner's approach**, Tata McGraw-Hill International , NewDelhi, Sixth Edition,2005
3. Pankaj Jalote, **An Integrated Approach to Software engineering**, Narosa Publishing House, NewDelhi Second Edition,1991
4. arlo Ghezzi, Mehdi Jazayeri & Dino Mandrioli, **Fundamentals of Software Engineering,** Prentice Hall of India Pvt. Ltd, New Delhi,1996

CORE XV- COMPUTER NETWORKS

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 5**
Subject Code : FBITC62/GBITC62 **Credit : 4**

Course Outcomes:

CO 1: Define and distinguish different network models

CO 2: Gain knowledge about Transmission media

CO 3: Understand how error detection and correction is performed

CO 4: Identify Address mapping and multicasting and perform congestion control and remote login

UNIT I **[15 Hours]**

Introduction: Data communications - Networks - The Internet - **Network Models**: Layered Tasks - The OSI model - Layers in the OSI model - TCP/IP Protocol suite - Addressing

UNIT II **[15 Hours]**

Physical Layer: Transmission Media: Guided media - Unguided media **Switching:** Circuit switched networks - Datagram networks - Virtual circuit networks - **Using Telephone and cable networks for data transmission:** Telephone network - Cable TV networks

UNIT III [**15 Hours]**

Data Link Layer: Error Detection and Correction: Introduction - Block coding - Linear block codes - Cyclic Codes – Checksum - **Data Link Control:** Framing - Flow and Error control - Protocols - Noiseless channels - Nosy channels - Point-to-point protocol - **Ethernet:** IEEE Standards - Standard Ethernet - Faster Ethernet - Gigabit Ethernet

UNIT IV **[15 Hours]**

Network Layer: Network Layer: IPV4 Addresses - IPV6 Addresses - **Internet Protocol:** Internetworking - IPV4 - IPV6 - **Address Mapping, Error Reporting, and Multicasting:** Address Mapping - ICMP – IGMP

UNIT V **[15 Hours]**

Transport Layer: Process - To Process Delivery: UDP, TCP: User Datagram Protocol (UDP) - TCP **Congestion Control and Quality of Service:** Data traffic - Congestion - Congestion Control -Quality of Service - Technique to improve QoS - **Application Layer: Domain Name System:** Name space - Domain name space - DNS in the Internet - DNS messages - **Remote Logging, Electronic Mail, and File Transfer:** Remote Logging - Electronic Mail - File Transfer - **WWW and HTTP:** Architecture - Web Document - HTTP

Text Book

1. Behrouz A Forouzan, **Data Communications & Networking**, Tata McGraw Hill, New Delhi, Fourth Edition, 2003

References

2. Andrew S Tanenboum, **Computer Networks**, Prentice Hall of India Pvt. Ltd., New Delhi, Fourth Edition, 2007

3. Douglas E Comer, **Computer Networks and Internets**, Pearson Education, New Delhi, Fourth Edition, 2004

CORE XVI- COMPUTER GRAPHICS

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 4**

Subject Code: FBITE5D/GBITC63 **Credit : 4**

Course Outcomes:

CO 1: Know the concepts of computer graphics

CO 2: Ability to understand output primitives and transformation

CO 3: Familiarity to windowing and clipping

CO 4: Know 3D concept, color and illumination

UNIT I **[12 Hours]**

Introduction to Computer Graphics: Introduction-Non Interactive/Interactive Computer Graphics-Uses of Computer Graphics-Classification of Applications-Programming Language, Graphics and Operating Software

UNIT II **[12 Hours]**

Output Primitives: Representing Image-Straight Line-Line Drawing Algorithms-DDA Algorithm-Breshenhams Line Algorithm-Circle Generating Algorithm-Midpoint Circle Algorithm-Ellipse Generating Algorithm-Midpoint Ellipse Generating Algorithm-Polygon Filling Algorithms
Two Dimensional Transformations: Basic Transformation-Matrix Representation of Homogenous Coordinates-Composite transformation-Other Transformation

UNIT III **[12 Hours]**

Windowing and Clipping: Viewing Transformation-Window to Viewport-Clipping-point Clipping-Line Clipping-Cohen Sutherland Line Clipping Algorithm -Liang Barsky Line Clipping Algorithm-Polygon Clipping-Sutherland Hodgeman Clipping Algorithm-Curve Clipping-Text Clipping

UNIT IV **[12 Hours]**

3D Concepts and Techniques: Introduction-3D Transformation-3D Modeling Schemes-Projection-Ortho Graphic Projection-Isometric Projection-Oblique Projection-Perspective Projection-One Two Three point Perspective-Viewing Parameter-Object-3D Clipping

UNIT V **[12 Hours]**

Color and Illumination Model: Introduction-Colors-Illumination Model and Light Sources-Specular Reflection-Intensity Attenuation-Shadow-Reflectivity and Refractivity-Radiosity Model-Animation: Devices for Producing Animation-Computer Assisted Animation-Video Formats-Frame by Frame Animation techniques-Real time Animation Techniques

Text Books

1. Amarendra N Sinha Arun D udai, **Computer Graphics**, Tata Mc Graw Hill Publishing Company limited, New Delhi,2008

References

2. Donald hearn, M.Pauline Bsker, **Computer Graphic**, Prentice hall of India Pvt.Ltd., New Delhi, Second Edition, 2001
3. William M.Newman, Robert F.Sproull, **Principles of interactive Computer graphics**, Tata Mc Graw-Hill International Edition, New delhi,Second Edition, 1997
4. Foley, Van Dam, Feiner, Hughen, **Computer graphics Principles and practice**, Addision-Wesley publishing Company,New Delhi, Second Edition,1990

CORE XVII- PROJECT

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 6**
Subject Code: FBITC64PW/GBITC64PW **Credit : 4**

Course Outcomes:

CO 1: Enhance team building skills
CO 2: Perspective towards formulate strategies
CO 3: Make decisions effective and efficient

Project shall be a group project (group consisting of maximum of two members)

ELECTIVE PAPERS

ELECTIVE I a) ENTERPRISE RESOURCE PLANNING

(For those who joined since 2018-19)

Semester: V **Hours/Week: 5**
Code : FBITE51A/GBITE5A **Credit : 5**

Course Outcomes:

CO 1: Know the Overview of ERP
CO 2: Analyse the methodology for implementing ERP
CO 3: Familiarity with Human Resource and ERP Package
CO 4: Know the roles of different companies involved in ERP Market
CO 5: Learn different applications and resources of ERP

CO 6: Reshaping towards Future direction

UNIT I **[15 Hours]**

Enterprise Resource Planning - ERP-An Overview-Enterprise-An Overview-Benefits of ERP-ERP and Related Technologies-Business Process Reengineering- Data Ware Housing-Data Mining-Online Analytical Processing-Supply Chain Management

UNIT II **[15 Hours]**

ERP Implementation-ERP Implementation Life Cycle-Implementation Methodology-The Hidden Costs-Organizing the Implementation-Vendors, Consultants and Users-Contracts with Vendors Consultants and Employees-Project Management and Monitoring- After ERP Implementation

UNIT III **[15 Hours]**

The Business Modules in an ERP Package-Finance-Manufacturing-Human Resources-Plant Maintenance-Materials Management-Quality Management-Sales and Distribution

UNIT IV **[15 Hours]**

ERP Market Place-SAP AG-People Soft-Baan Company-JD Edwards World Solutions Company-Oracle Corporation-QAD-System Software Associates

UNIT V **[15 Hours]**

Turbo Charge the ERP System-Enterprise Integration Applications-ERP and E-Commerce - ERP and Internet - Future Directions in ERP- ERP Resources on the Internet - ERP Case Studies – ERP- A Manufacturing Perspective

Text Book

1. Alexis Leon, **ERP Demystified**, Tata Mc Graw-Hill Publishing Company, New Delhi, 2006

References

2. Vinod Kumar Garg & N.K. Venkita Krishnan, **Enterprise Resources Planning – Concepts and Practise**, Prentice Hall of India, India, 1998
3. Jose Antonio fernandz, **The SAP R/3 Handbook**, Tata Mc Hill Education, New Delhi,1998

ELECTIVE I b) COMPILER DESIGN

(For those who joined since 2018-19)

Semester : V **Hours/Week: 5**
Subject Code : GBITE5B **Credit : 5**

Course Outcomes:

CO 1: Know about compiler and translators
CO 2: Understand the Lexical Analysis and basic parsing techniques
CO 3: Knowledge on automatic construction of efficient parsers
CO 4: Learn syntax directed translation and symbol tables
CO 5: Familiarity with error detection and recovery
CO 6: Acquire code optimization and generation technique

UNIT I **[15 Hours]**

Introduction to compilers: Compilers and translators - Why do we need translators - The structure of a compiler - Lexical analysis - Syntax analysis - Intermediate code generation - Optimization - Code generation - Bookkeeping - Error handling - Compiler

UNIT II **[15 Hours]**

Lexical analysis: The role of the Lexical analyzer - A simple approach to the design of lexical analyzers - Regular expression-Finite Automata

Basic Parsing techniques: Parsers - Shift- reduce parsing - Operator-precedence parsing - Top-down parsing - Predictive parsers

UNIT III **[15 Hours]**

Automatic construction of efficient parsers: LR parsers - The canonical collection of LR(0) items - Constructing SLR parsing tables - Constructing canonical LR parsing tables - Constructing LALR parsing tables - Using ambiguous grammars - An automatic parser generator - Implementation of LR parsing tables

UNIT IV **[15 Hours]**

Syntax-Directed Translation: Syntax-directed translation schemes - Implementation of syntax-directed translators - Intermediate code - Postfix notation - Parse trees and syntax trees -Three-address code, quadruples and triples - Postfix translations

Symbol tables: The contents of symbol table - Data structures for symbol tables - Representing scope information

UNIT V **[15 Hours]**

Error detection and recovery: Errors - Lexical-phase errors - Syntactic-phase errors - Semantic errors.

Introduction to code optimization: The principal sources of optimization - Loop optimization - The DAG Representation of basic blocks

Code generation: Object programs - Problems in code generation - A simple code generator - Peephole optimization

Text Book

1. Alfred V. Aho , Jeffrey D. Ullman, **Principles of Compiler Design**, Narosa Publishing House, New Delhi, Twenty fifth reprint, 2002

References

2. Dr. Kakde O G, **Comprehensive Compiler Design**, Laxmi Publications Pvt. Ltd., New Delhi, Third Edition, 2005
3. Dick Grune, Henri E Bal, Ceriel J H Jacobs, Koen G Langendoen, **Modern Compiler Design**, Wiley India Pvt., Ltd., New Delhi, Second Edition, 2012

ELECTIVE II a) WEB SERVICES

(For those who joined since 2018-19)

Semester : V **Hours/Week: 5**
Subject Code: FBITE5C/GBITE5C **Credits : 5**

Course Outcomes:

CO 1: Understand web services benefits &drawbacks

CO 2: Obtain knowledge about XML and WSDL

CO 3: Expertise to exchange messages with SOAP

CO 4: Know how to build web services with different Tool kits

CO 5: Understand how to create web services with java and .NET

CO 6: Know the implementation of web services in the real world

UNIT I **[15 Hours]**

Introducing Web Services: Understanding Web Services- Advantages of Web Services- Disadvantages and pitfalls of Web Services- Comparing Web Services to other Technologies

UNIT II **[15 Hours]**

Working with Web Services: The Web Services Architecture –Understanding XML –Understanding how Web Services Communicate- Exchanging Messages with SOAP-Describing a Web Service with the Web Services Description Language (WSDL)

UNIT III **[15 Hours]**

Building Web Services: Creating Web Services with Apache Axis- Creating Web Services with Java- Creating Web Services with .NET

UNIT IV **[15 Hours]**

Building Web Services: Creating Web Services with BEA Web Logic Workshop- Creating Web Services with IBM WebSphere- Creating Web Services with Other Toolkits

UNIT V **[15 Hours]**

Advanced Topics: Web Services Interoperability – Web Service Security – Web Services in the Real World

Text Book

1. Stephen Potts and Mike Kopack, **SAMS Teach yourself Web Services in 24 Hours**, Pearson Education, New Delhi,2004.

Reference

2. Ron Schmelzer et al, **XML and Web Services**, Pearson Education, New Delhi, 2002

ELECTIVE II b) E-COMMERCE

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 4**
Subject Code: FBITC63/GBITE5D **Credit : 4**

Course Outcomes:

CO 1: Understand the concepts of E-commerce

CO 2: Overview of internet and WWW

CO 3: Acquire the knowledge of Consumer & Business Oriented Commerce

CO 4: Categories E-Services, web advertising and Publishing

UNIT I **[12 Hours]**

Introduction : Electronic commerce and physical commerce - Digital Phenomenon - Looking at e-commerce from different perspectives - Different Types of e-commerce - Example of the types of e-commerce - Some e-commerce scenarios - Changes bought by e-commerce - Advantages of e-commerce - Myths about e-commerce development and implementation - System model

UNIT II **[12 Hours]**

Internet and World Wide Web : An Overview of the internet - Brief history of the web - Web system architecture - Uniform Resource Locator - Overview of the hypertext transfer protocol – HTTP - Generation of dynamic web pages – Cookies - HTTP/1.1.**Client server programming :** Important factors in the client – side or web programming - Web design and production – Overview of HTML - Basic structure of an HTML document - Basic text formatting – Links - Images – Image Map – Tables – Frames -Form – Cascading Style sheet- JavaScript

UNIT III **[12 Hours]**

Server side programming I : server fundamentals - The three-tier model - Common Gateway interface - Active server page - Overview of java servlets - java servlet architecture - Overview of the servlets API - Building the virtual book store - Your first servlet - Compilation and execution of servlets - An interactive servlet program example - **Applications - Internet payment systems:** Characteristics of payment systems - 4C payment methods - SET Protocol for credit card payment - E-cash – E-check –Micro payment system - Overview of smart card – Overview of Mondex

UNIT IV **[12 Hours]**

Consumer Oriented e-commerce: Introduction – traditional retailing and e-retailing – Benefits of e-retailing – Key success factors - Models of e-retailing – Features of e-retailing – Developing a consumer – oriented e-commerce system – The PASS Model. **Business – oriented e-commerce:** Features of B2B e-commerce – Business models – Integration

UNIT V **[12 Hours]**

E-services: Categories of e-services – web-enabled services – March making services – information-selling on the web – E-entertainment – Auctions and other specialized services. **Web advertising and web publishing:** traditional versus internet advertising – Internet advertising techniques and strategies – Business models for advertising and their revenue streams – Pricing models and measurement of the effectiveness of advertisements- Web publishing – Web site development methodologies – Logical Design of user interface- Usability testing and quality assurance – Web Presence and visibility

Text Book

1. Herry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, **E-Commerce Fundamentals and Applications**, John Wiley & Sons Ltd, New Dehi, 2001

References

2. Kamalesh K Balaj & Debjani Nag, **E-Commerce, The cutting edge of business**, Tata McGraw- Hill Publications, New Delhi, 2000
3. Kalakota & Whinston, **Frontiers of Electronic Commerce**, Pearson Education Asia, 2006

ELECTIVE III b) ETHICAL HACKING

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 5**
Subject code: GBITE6B **Credits : 5**

Course Outcomes:

CO 1: Learning the importance of information security and understanding Hacktivism
CO 2: Analyse different scanning and enumeration methodologies and tools
CO 3: Understand various hacking techniques and attacks
CO 4: Know different types of keyloggers
CO 5: Exposing programming languages for security professionals
CO 6: Familiarity with the different phases in penetration testing

UNIT I **[15 hours]**

Introduction to Hacking – Importance of Security – Elements of Security – Phases of an Attack – Types of Hacker Attacks – Hacktivism – Vulnerability Research – Introduction to Footprinting – Information Gathering Methodology – Footprinting Tools – WHOIS Tools – DNS Information Tools — Meta Search Engines

UNIT II **[15 hours]**

Introduction to Scanning – Objectives – Scanning Methodology – Tools-Live system scanning tools-Port scanning tools-File extension tools-Vulnerability scanning tools-Network mapping tools-Proxy tools-Spoofing tools – Introduction to Enumeration – Enumeration Techniques – Enumeration Procedure – Tools

UNIT III **[15 hours]**

Introduction – Cracking Passwords – Password Cracking Websites – Password Guessing – Password Cracking Tools – Password Cracking Counter measures – Keyloggers and Spyware – Steganography

UNIT IV **[15 hours]**

Programming Fundamentals – C language – HTML – Perl – Windows OS Vulnerabilities – Tools for Identifying Vulnerabilities – Linux OS Vulnerabilities –Web Application Vulneabilities

UNIT V **[15 hours]**

Introduction – Security Assessments – Types of Penetration Testing- Phases of Penetration Testing – Tools – Choosing Different Types of Pen-Test Tools – Penetration Testing Tools

Text Book

1. Ec-Council, **Ethical Hacking and Countermeasures: Attack Phases**, Delmar Cengage Learning, 2009

References

77789440. Michael T. Simpson, Kent Backman, James E. Corley, **Hands-On Ethical Hacking and Network Defense**, Cengage Learning, 2012
77789441. Patrick Engebretson, **The Basics of Hacking and Penetration Testing – Ethical Hacking and Penetration Testing Made Easy**, Syngress Media, Second Revised Edition, 2013
77789442. Jon Erickson, **Hacking: The Art of Exploitation**, No Starch Press, Second Edition, 2008

SKILL BASED ELECTIVE PAPERS

OFFICE AUTOMATION LAB

(For those who joined since 2018-19)

Semester : I **Hours/Week : 2**
Subject code: FBITC12P/GBITE15P **Credits : 2**

Course Outcomes:

CO 1: Create, edit and save file
CO 2: Perform simple arithmetic calculation
CO 3: Ability to create and manipulate presentation
CO 4: Usage of databases

WORD

1. Working with Files-Creating and opening documents, Saving documents, Renaming documents, working on multiple documents. Working with Text – Formatting, Moving, copying and pasting text
2. Lists – Bulleted and numbered lists, Nested lists, Formatting lists
3. Table Manipulations
4. Graphics – Adding clip Art, Add an image from a file, Editing a graphic
5. Spelling and Grammar, AutoCorrect
6. Page formatting-Page margins, page size and orientation, Header and footers, page numbers
7. Mail Merge
8. Macros – Recording a macro, Running a macro
9. Web wizard – Using the Web Wizard, Creating & Saving web pages, Hyperlinks

EXCEL

1. Modifying a Worksheet – Moving through cells, Adding worksheets, rows and columns, Resizing rows and columns, Selecting cells, Moving and copying cells, Freezing panes
2. Macros – recording and running
3. Formatting cells-Formatting toolbar, Dates and times, Auto formatting
4. Formula and Functions
5. Linking worksheets-Relative, absolute and mixed referencing
6. Sorting and Filling –Basic ascending and descending sorted, Complex sorts, Alternating text and numbers with Auto fill, Auto filling functions
7. Graphics – Adding clip art, add an image from a file
8. Charts – Using chart Wizard, Copy a chart to Microsoft Word

POWER POINT

1. Create a Presentation from a template
2. Working with Slides-Insert a new slide, Applying a design template, Changing slide layouts, Reordering slides, Hide slides
3. Adding Content –Resizing a text box, Text box properties, Delete a text box
4. Video and Audio effects
5. Color Schemes & Backgrounds
6. Save as a web page

ACCESS

1. Using Access database wizard, pages and projects
2. Open an existing database , converting to Access 2000
3. Screen Layouts – Database window, Design view, Datasheet view
4. Creating Tables – Create a Table in design view, Primary key, Indexes, Field validation rules
5. Datasheet Records – Adding, Editing, Deleting records, Adding and deleting columns & Resizing rows and columns, Finding data in a table & replacing, Print a datasheet
6. Declaring Table Relationships

7. Sorting and Filtering-Sorting, Filter by selection, by form, saving & removing a filter
8. Queries – Create a query in design view, Query Wizard, Find duplicates query Delete
9. Forms –Create a form using the wizard, Create a form in Design View
10. Reports-Using the wizard, Create in Design View, Printing reports

Note: - Questions for Internal and External examination will be based on concept learnt

LINUX AND SHELL PROGRAMMING LAB

(For those who joined since 2018-19)

Semester : II **Hours/Week : 2**
Subject code: FBITE15P/GBITE25P **Credits : 2**

Course Outcomes:

CO 1: Understand the basis of Linux shell scripting
CO 2: Ability to solve problem
CO 3: Gain knowledge of creating username and password
CO 4: Learn about usage of various commands

Command

1. Write a shell program to use who commands
2. Write a shell program to use list commands
3. Write a shell program to use sort commands
4. Write a shell program to use wc commands
5. Write a shell program to use cat commands
6. Write a shell program to use the grep commands

Formula Substitution

7. Write a shell program to find odd or even number
8. Write a shell program to find smallest among three numbers
9. Write a shell program to find the factorial value
10. Write a shell program to display multiplication table

Switch case

11. Write a shell program to use case statement

Functions

12. Write a shell program to display username, pwd using function
13. Find age of a person using set date

Checking

14. To check the given file is a directory or not

String Manipulation

15. Convert lowercase to uppercase using tr statement

Note: Questions for External examination will be based on concept learnt

PHP LAB

(For those who joined since 2018-19)

Semester : III **Hours/Week: 3**
Subject code : FBITE46P/GBITE36P **Credits : 2**

Course Outcomes:

CO 1: Familiarity in designing webpage using HTML tags
CO 2: Able to include Audio and Video
CO 3: Ability to work in IDE Environment
CO 4: Performing the Mathematical Calculations

Tags

1. Create a PHP page for displaying the personal information by using various tags
2. Create a PHP page, which includes images for any application
3. Create a PHP page for displaying the tender notice which is given to you
4. Create PHP page for displaying your curriculum vita
5. Create a web page to advertise a product of the company using images and audio
6. Create your own personal web page
7. Create a web page for a web magazine

Frames

8. Design a web page for travel agency using frames

Hyperlink

9. Design a web page of a company using hyperlink

Checking

10. Write a PHP program to check whether the given number is Perfect or not
11. Write a PHP program to check whether the given string is Palindrome or not
12. Write a PHP program to check whether the given number is Prime or not
13. Write a PHP program to check whether the given number is Armstrong or not

Functions

14. Write a PHP program to display the system date and time
15. Write a PHP program to find largest value of two numbers using nesting of member functions

Note: - Questions for the external examination will be based on the concepts learnt

SOFTWARE DEVELOPMENT FRAMEWORK LAB (ASP.NET)

(For those who joined since 2018-19)

Semester : IV **Hours / Week: 3**
Subject code : FBITE65P/GBITE46P **Credit : 2**

Course Outcomes:

CO 1: Able to write console applications
CO 2: Develop Windows and web Applications
CO 3: Demonstrate validation controls in web form
CO 4: Connect Data Grid control to database in Web application

Checking

1. Write a console program to check a given number is prime or not
2. Write a console program to check the number is perfect or not
3. Write a console program to check a given number is Armstrong or not

Window applications

77788096. Write a windows application program to build a simple calculator
77788097. Write a windows application program to create notepad
77788098. Write a windows application program to calculate area of circle, rectangle, and triangle according to a selection of drop down list

Controls

77788768. Write a ASP.Net website program to find age of the person using calendar control
77788769. Write a ASP.Net website program to change font name and color using radio button list and checkbox list controls
77788770. Create a student details form and validate the details using validation controls
77788771. Display employee details using data grid control
77788772. Display an Electricity bill using data list control
77788773. Display employee details using repeater control

Note: - Questions for the external examination will be based on the concepts learnt

VISUAL PROGRAMMING LAB

(For those who joined since 2018-19)

Semester : V **Hours/Week: 3**
Subject code : FBITC421P/GBITE54P **Credits : 2**

Course Outcomes:

CO 1: Acquire the skills for developing applications
CO 2: Implement GUI program using carious control in tool box
CO 3: Implement to use databases
CO 4: Get knowledge to animate pictures

Formula substitution

1. Write a Visual basic program to find the binomial co-efficient for given N & R value

Array

2. Write a Visual basic program to add, delete item to the list and transfer an item from one list to another list
3. Write a Visual basic program to arrange the number in order
4. Write a Visual basic program to design a calculator using control arrays

Functions

5. Write a Visual Basic program to check given number is prime or not using function
6. Write a Visual basic program to implement all date & time functions

Calendar control

7. Write a Visual basic program to calculate the age of the person using calendar control

String Manipulation

8. Write a Visual basic program to perform all string manipulations

Drawing and Animation

9. Write a Visual basic program to animate picture
10. Write a Visual basic program to implement freehand drawing

Menu Creation

11. Write a Visual basic program to create your own notepad

DAO & ADO Control

12. Write a Visual basic program to prepare student mark list using DAO control
13. Write a Visual basic program to prepare electricity bill using ADO control
14. Write a Visual basic program to enumerate employee details using ADO control and generate report

Note: - Questions for the external examination will be based on the concepts learnt

SKILL BASED ELECTIVE - OPEN TECHNOLOGY LAB (PYTHON)

(For those who joined since 2018-19)

Semester : VI **Hours/Week: 3**
Subject Code: GBITE65P **Credits : 2**

Course Outcomes:

CO 1: Acquire the skills for developing python script
CO 2: Knowledge to create simple application window
CO 3: Ability to create web site
CO 4: Know to create simple blogs.

Display Text

1. Write a python program to display any given text message

Formula Substitution

2. Write a python program to display Fibonacci serious

Array

3. Write a python program to count the number of vowel in the string

Function

4. Write a python program to convert a date read from the user, given in DD/MM/YYYY format into written format. For example, Enter a date in DD/MM/YYYY Format: 16/7/2003 Output: 16 July, 2003
5. Write a python program to print the contents of a file in uppercase using function
6. Write a python program to sort the contents of a file using function

Operator Overloading

7. Write a python program to implement Operator Overloading

Script

8. Write a python script that implements the Arithmetic Quiz
9. Write a python script to create a button with the text, "Hello World"
10. Write a python script that creates a combo box with three elements. When the selection is changed the selected item is to be printed
11. Write a python script that creates a simple application window with menus and submenus
12. Write a python script that creates a simple application window with displaying lines
13. Write a python program to create your own web site for displaying message
14. Write a python program to create a simple blog using models

Note: - Questions for the Internal/External examination will be based on the concepts learnt

EXTRA CREDIT PAPERS

PHOTOSHOP

(For those who joined since 2018-19)

Semester : II **Hours/ Week: -**
Subject Code: FBITX2/GBITX2 **Credits : 2**

Course Outcomes:

CO 1: Understand the menus and tools
CO 2: Differentiate between various color modes and models
CO 3: Learn different types of layers and filters
CO 4: Know to add special effects in background

UNIT I

The Basics: The Toolbox-tool Options Bar- on the menus- Opening and saving: Working with Files-Saving your work-Undoing and Redoing-Selection - **Modes:** The selection Tools-the selection Menu-selecting large Areas-Cutting and Copying-Cropping: Transformations: Resizing-Rotating-Flipping-Selection Transformations-Liquefy

UNIT II

Color Modes and Color Models: Color Models-The Modes and models of Color-Paintbrushes and Art Tools: The Brushes Palette-Brushes-Digital Painting: Foreground and Background Colors-Selecting Colors-Blending Modes - Moving Paint: Smudges-Focus Tools-The Toning Tools-Advanced Painting Techniques

UNIT III

Layers: Using the Layers Palette-Working with Multiple Layers-Using Masks: Applying Masks-Using Quick Mask –Layers Masks-Paths: Creating Paths- Editing Paths- Using Paths

UNIT IV

Filters: Sharpen Filters-Blur Filters-Fading Filters-Artistic Filters-Brush Strokes-Sketch Filters-Distort Filters-Pixelate Filters Stylize-Combining Filters

UNIT V

Adding Type to Picture:-The Type Tools-Setting Type-Creating Drop Shadows on Backgrounds-Cutting and Filling Type-Adding Glows-Creating Bevel and Emboss Effects-Warping Text-Checking Your Spelling-Special effects and Useful Tricks-Compositing-Photo Repair Black and White-photo Repair color

Text Book

1. Carla Rose , **Adobe Photoshop 7**, Tec media Publication, New Delhi ,2002 Chapters: 1 - 5, 7-17, 20-22

Reference

2. Ken Milbum, **Photoshop 7 Virtual Class Room Training Kit** , Dreamtech Publications, New Delhi 2002

DESIGN AND DRAFTING LAB (AutoCAD Lab)

(For those who joined since 2018-19)

Semester : III **Hours/Week: -**

Subject Code: FBITX3P/GBITX3P **Credits : 2**

Course Outcomes:

CO 1: Able to apply CAD in real time applications

CO 2: .Ability to design the elevation in 2D

CO 3: Learn to plan with appropriate dimensions

CO 4: Know to design the garments

Elevation

1. Draw the elevation of your imaginary modern house and assume your own dimensions
2. Draw the elevation of the school in which you have studied and assume your own dimensions
3. Draw the elevation of your college in which you are studying. Assume your own dimensions
4. Draw the imaginary elevation of a hospital which you have decided to build in future assume your own dimensions.
5. Draw the elevation of your city police station & assume your own dimensions.
6. Draw the elevation of your worshipping place & assume your own dimensions.
7. Consider that you are working in a factory/industry/company. Draw the elevation of your working place & assume your own dimensions
8. Draw the elevation of any one of the world wonders assuming your own dimensions
9. Draw the elevation of any one of the shopping mall by assuming your own dimensions
10. Draw the elevation of the ribbon building and assume your own dimensions.
11. Draw the elevation of any one of the rocket by assuming your own dimension

Plan

12. Draw the plan for the house for a middle class family which has one kitchen, one bed room, one wash room, one balcony using two dimensions.
13. Draw the plan for the house for a high class family which has a modern kitchen, one living room, two bed rooms with attach bath rooms and wash rooms, one library, one dining hall, one guest room, one home theatre and balcony using two dimensions.
14. Draw the elevation of a four-wheeler vehicle .Assume your own dimensions
15. Draw the plan of the school in which you have studied using two dimensions. The plan has to include the garden, principal's room, office room, class rooms and the playground
16. Draw the plan of your college which has the reception hall, principal's office, office room, trustees room, computer department, staff room, library, I ,II,III year class rooms, toilet. Assume your own dimensions.
17. Draw the imaginary plan of a hospital, which contains the incoming patient's room, outpatient's room, doctor's room, rest room, operation theatre, ICU, wardrooms etc. assume your own dimensions
18. Draw a natural scenery Using tools available in the AutoCAD
19. Draw the plan for any one of the super market around your city

Garment Designing

20. Consider that you are one of the best fashion designer and you have been called to design a female garment Design a female garment using two dimensions
21. Design a female garment using two dimensions

Note: - Questions for the external examination will be based on concept learnt

MULTIMEDIA

(For those who joined since 2018-19)

Semester: IV **Hours/Week: -**

Sub Code: FBITX51/GBITX4 **Credits : 2**

Course Outcomes:

CO 1: Grasping basic concepts of multimedia

CO 2: Learn to use text, graphics, digital audio and video

CO 3: Ability to design product

CO 4: Describing the usage of multimedia and internet

UNIT I

Introduction: History of Multimedia – Definition - Multimedia market – content and copyright - resources for multimedia developers - types of products – evaluation - computer Architecture – Standards - operating systems and software - Multimedia computer Architecture

UNIT II

Text & Graphics: Elements of text - text data files - using text in multimedia applications – Hypertext - elements of graphics - images & color - graphics file and application format – obtaining images for multimedia use - using graphics in multimedia applications

UNIT III

Digital Audio & Video: Characteristics of sound and digital audio - digital audio systems – MIDI - Audio File Formats - using audio in Multimedia Applications. Background on video - characteristics of digital video - digitl video data sizing - video capture and playback systems - computer Animation

UNIT IV

Product design & authoring tools: Learning Outcomes - categories of authoring tools - selecting the right authoring paradigm - building blocks - classes of products – content - organization strategies - Story boarding

UNIT V

Multimedia & the Internet: Internet - HTML and Web authoring - multimedia considerations for the Internet - design considerations for web pages. Multimedia development team & process - Team approach - Assembling a multimedia production team - multimedia development issues - costing a multimedia project

Text Book

1. David Hillman, **Multimedia Technology and applications**, Thomson Publishing Company, Toronto, 1998

References

2. James E. Shuman, **Multimedia in Action**, International Thomson Publishing Company, Toronto,1998
3. Judith Jeffcoate, **Multimedia in Practice Technology & Applications**, Prentice Hall of India,New Delhi, 2003
4. Tay Vaughon, **Multimedia making it work**, Cassell Education Ltd, 2008

VISUAL PROGRAMMING

(For those who joined since 2018-19)

Semester : V **Hours/Week: -**
Subject code: FBITX41/GBITX5 **Credits : 2**

Course Outcomes:

CO 1: Understand concepts of variables, data types and arrays
CO 2: Learn to use buttons, menus, dialog boxes and grid control
CO 3: Learn to access data objects and connectivity to ODBC
CO 4: Know to generate data reports and usage of ActiveX controls

UNIT I

Getting started with Visual Basic: Introduction to Visual Basic- Visual Basic 6.0 programming environment- Working with forms- Developing an application- Variables, Data Types and Modules- Procedures and control structures- Arrays in Visual Basic- Working with controls- Introduction- Creating and Using Controls- Working with Control Arrays

UNIT II

Menus, Mouse Events and Dialog Boxes: Introduction- Mouse events- Dialog Boxes-Graphics, MDI and Flex Grid- Introduction- Graphics for Applications- Multiple Document Interface- Using the Flex Grid Control

UNIT III

ODBC and Data Access Objects: Evolution of Computing Architectures- Data Access Options- ODBC using Data Access Objects and Remote Data Objects-ODBC- Remote Data Objects

UNIT IV

Data Environment and Data Report: Introduction- Data Environment Designer- Data Report- Object Linking and Embedding- Introduction- OLE fundamentals- Using OLE Container Control- Using OLE Automation Objects- OLE Drag and Drop

UNIT V

All about ActiveX Controls: Introduction- Constituents of ActiveX Control – Exposing ActiveX Control Properties- Files and File System Controls- Introduction- File System Controls- Accessing files- Interface with windows

Text Book

1. Content Development Group, **Visual Basic 6.0 Programming,** Tata Mc Graw Hill Education,New Delhi,2007

References

2. Evargelous Petroutos, **Masterning Visual Basic 6 ,** BPB Publications, NewDelhi, 2000
3. Pk. McBride , **Programming in visual Basic**, BPB Publications, NewDelhi,1995

B Sc COMPUTER SCIENCE

(Three Years Regular Programme)

(For those who joined since 2018-19)

Program Specific Outcomes (PSO)

PSO 1: Providing thorough ground in the basics of a subject effectively for developing commercial and scientific applications

PSO 2: Produce globally-competitive graduates with appropriate computing skills

PSO 3: Prepare students for career/higher studies in Computer Science

PROGRAMME STRUCTURE

Sem	Part	Subject Code	Course	Subject Title	Hrs/ wk	Credit	CIA Marks	ESE Marks	Total Marks
I	I	GBLT11/ GBLA11/ GBLIA11/ GBLH11	Language I	Tamil I/ Basic Arabic I/ Intermediate Arabic I/ Hindi I	6	6	40	60	100
	II	GBLF12 / GBLG12	Language II	Functional English I / General English I	6	6	40	60	100
		GBCSC11	Core I	Fundamentals of Computers	5	4	40	60	100

	III	GBCSC12P	Core II	Office Automation Lab	5	4	40	60	100
		GBCSA13	First Allied I	Digital Electronics	4	3	40	60	100
		GBCSA14P	First Allied II	Digital Electronics Lab	2	2	40	60	100
	IV	GBCSE15P	Skill Based Elective	Multimedia Lab - I (Photoshop)	2	2	-	50	50
				Total	**30**	**27**	**240**	**410**	**650**
II	I	GBLT21/ GBLA21/ GBLIA21/ GBLH21	Language I	Tamil II/ Basic Arabic II/ Intermediate Arabic II/ Hindi II	6	6	40	60	100
	II	GBLF22 / GBLG22	Language II	Functional English II / General English II	6	6	40	60	100
	III	GBCSC21	Core III	Programming in C	4	3	40	60	100
		GBCSC22P	Core IV	Programming in C Lab	4	3	40	60	100
		GBCSA23	First Allied III	Microprocessor	4	3	40	60	100
		GBCSA24P	First Allied IV	Microprocessor Lab	2	2	40	60	100
	IV	GBCSE25P	Skill Based Elective	Multimedia Lab - II (Flash)	2	2	-	50	50
		GBES2	General Interest Course I	Environmental Studies	2	2	-	50	50
		GBCSX2O	Extra Credit	*Online Certification	-	2	-	-	-
				Total	**30**	**27+2**	**240**	**460**	**700**
III	III	GBCSC31	Core V	Programming in C++	6	4	40	60	100
		GBCSC32P	Core VI	Programming in C++ Lab	6	4	40	60	100
		GBCSA33	Second Allied I	Mathematical Foundation for Computer Science	6	5	40	60	100
	IV	GBCSE34P	Skill Based Elective	Web Designing Lab – I (HTML)	3	2	-	50	50
			Non-Major Elective		4	2	-	50	50
		GBHR3	General Interest Course II	Human Rights	3	2	-	50	50
	V	GBXTN3	Extension Activities	NSS / CSS	2	2	100	-	100
	-	GBCSX3P GBCSX3O	Extra Credit	Linux and Shell Programming Lab / *Online Certification	-	2	-	100 / -	100
				Total	**30**	**21+2**	**220**	**330 + 100**	**550 + 100**
		GBCSC41	Core VII	Operating System	5	4	40	60	100
		GBCSC42	Core VIII	Data Structures And Algorithms	5	4	40	60	100

IV	III	GBCSC43P	Core IX	Visual Programming Lab	5	4	40	60	100
		GBCSA44	Second Allied II	Operations Research	6	5	40	60	100
	IV	GBCSE45P	Skill Based Elective	Web Designing Lab – II (Scripting Language)	3	2	-	50	50
		GBVE4	General Interest Course III	Values and Ethics	2	2	-	50	50
			Non-Major Elective		4	2	-	50	50
	-	GBCSX4P / GBCSX4O	Extra Credit	Data Structures Lab / *Online Certification	-	2	-	100	100
				Total	**30**	**23+2**	**160**	**390 + 100**	**550 + 100**
V	III	GBCSC51	Core X	Programming in Java	4	3	40	60	100
		GBCSC52P	Core XI	Programming in Java Lab	5	4	40	60	100
		GBCSC53	Core XII	RDBMS	4	3	40	60	100
		GBCSE5A	Elective I	a. Web Technology	5	5	40	60	100
		GBCSE5B		b. Cloud Computing			40 T-20 P-20		
		GBCSE5C / GBCSE5D	Elective II	a. Software Development Framework / b. PHP	5	5	40 T-20 P-20	60	100
	IV	GBCSE54P	Skill Based Elective	RDBMS Lab	3	2	-	50	50
		GBWS5	General Interest Course IV	Women Studies	3	2	-	50	50
	-	GBCSX5O	Extra Credit	*Online Certification	-	2	-	-	-
				Library/Browsing	1	-	-	-	-
				Total	**30**	**24+2**	**200**	**400**	**600**
VI	III	GBCSC61	Core XIII	Software Engineering	5	4	40	60	100
		GBCSC62	Core XIV	Computer Networks	5	4	40	60	100
		GBCSC63	Core XV	Open Technology	5	4	40	60	100
		GBCSC64PW	Core XVI	Project	6	4	40	60	100
		GBCSE6A / GBCSE6B	Elective III	a. Mobile Application Development / b. Compiler Design	5	5	40 T-20 P-20	60	100
	IV	GBCSE65P	Skill Based Elective	Open Technology Lab	2	2	-	50	50
	-	GBSED6	Extra Credit	Skills for Employability Development	-	2	100	-	100
				Library/Browsing	2	-	-	-	-

Total	**30**	**23+2**	**200 + 100**	**350**	**550 + 100**
Grand Total	**180**	**145+10**	**1260 + 100**	**2340 + 200**	**3600 + 300**

* For Online certification credit alone will be assigned on submission of certificate obtained through appearing for online examination from EDX, Spoken Tutorial, NPTEL or Coursera etc., approved by the department.

CORE I – FUNDAMENTALS OF COMPUTERS

(For those who joined since 2018-19)

Semester : I **Hours/week: 5**
Subject Code : GBCSC11 **Credits: 4**

Course Outcomes:

CO 1: Understand the basics of computers and its generations
CO 2: Know computer architecture and number system
CO 3: Acquire knowledge about CPU, memory and secondary storage devices
CO 4: Know about input devices, output devices and computer software

UNIT I **[15 Hours]**

Introduction to Computers: Introduction - Importance of Computers - Characteristics of Computers - Classification of Computers - What Computers can do - What Computers cannot do - Uses of Computers. **Five Generations of Modern Computers:** Introduction - First, Second, Third, Fourth and Fifth Generation of Computers.

[15 Hours]

UNIT II

Computer Architecture: Introduction- First Electronic Computers - Low-level Languages - High - Level languages - First Commercial Computers - Inside a Computer System - CISC and RISC. **The Number System:** Introduction - Decimal Number System - Binary Number System - Complements - Signed and Unsigned Number - BCD - Gray Code - Excess-3 Code - ASCII Code - EBCDIC Code - Bits, Bytes and Words - Octal Number System - Hexadecimal Number System

UNIT III **[15 Hours]**

Central Processing Unit and Memory: Introduction - Central Processing Unit - Memory - Memory Organization - Random Access Memory - Read Only Memory - Registers - Factors affecting processor Speed. **Secondary Storage Devices:** Secondary Storage Devices - Magnetic Tape - Magnetic Disk - Optical Disk - Zip Disk - Jaz Disk - Super Disk - Magneto Optical Disk.

[15 Hours]

UNIT IV

Input Devices: Introduction - Keyboard - Mouse - Track ball - Game Controllers - Scanners - Bar code Reader - Card Reader - Digitizer - Voice Recognition - Web Cams - Digital Camera - Video Cameras - Optical Character Recognition (OCR) - Optical Mark Recognition (OMR) - Intelligent Character Recognition (ICR) - Magnetic Ink Character Recognition (MICR)

UNIT V **[15 Hours]**

Output Devices: Introduction - Monitor - Printer-Plotter - Multimedia Projector - Speech Synthesizers - Sound cards and Speakers. **Introduction to Computer Software**: Introduction - Compute Software - Hardware/Software Interaction- Classification of Software - Operating System - Utilities - Compilers and Interpreters - Word Processors - Spreadsheets - Presentation Software - Image Processors - Data Base Management Systems(DBMS).

Text Book

1. Alexis Leon, Mathews Leon, **Fundamentals of Information Technology**, L & L Consultancy Services Pvt. Ltd., Kerala, Second Edition, 2013

References

2. Kartherine Murray , Mary Millholon, Beth Melton, **Microsoft Office Word 2007**, Prentice Hall of India Pvt. Ltd., New Delhi, Third Edition, 2007
3. ITL Education Solutions Limited, **Introduction to Information Technology**, Pearson Education, New Delhi , Fourth Edition, 2007
4. Raja Raman, **Computer Fundamentals**, Prentice Hall India Pvt Limited, New Delhi, 2003

CORE II - OFFICE AUTOMATION LAB

(For those who joined since 2018-19)

Semester : I **Hours/week: 5**
Subject Code : FBCSC121P/GBCSC12P **Credits: 4**

Course Outcomes:

CO 1: Acquire skill to develop, edit and formatting documents in computer
CO 2: Obtain knowledge about creating and manipulating Spreadsheets
CO 3: Gain knowledge on managing databases
CO 4: Develop interactive power point presentations

WORD

1. Prepare a your class time table
2. Prepare the given advertisement
3. Illustrate the use of hyperlinks in your document
4. Prepare a job application and send to three companies using mail merge using WORD
5. Prepare an application form for college admission using WORD
6. Design the invitation using WORD

EXCEL

7. Prepare a bar chart representing population for the last 5 years in EXCEL. Assume the population indices
8. Illustrate the numeric functions in EXCEL
9. Illustrate the character functions in EXCEL
10. Prepare students mark list (total, average, grade and rank) using EXCEL
11. Prepare electricity bill using EXCEL
12. Prepare employee pay bill and order them according to their salaries in EXCEL

ACCESS

13. Create a table on student Marks details and query the table to list students who are getting greater than 90 marks in Mathematics using ACCESS
14. Create a table on player details and prepare report using ACCESS
15. Create a table on Employee details and query the table to list employees who are getting salary more than RS. 10,000 using ACCESS
16. Create a table on Employee details and prepare report using ACCESS
17. Create a table on Employee details using ACCESS and update the salary using a form

POWER POINT

18. Do a presentation with a minimum of 5 slides on "TOURISM" using POWER POINT
19. Do a presentation with a minimum of 5 slides on the topic "MY NATION" using POWER POINT with audio
20. Do a presentation with a minimum of 5 slides on the topic "MY COLLEGE" using POWER POINT

Note: - Questions for the Internal/External examination will be based on the concepts learnt

FIRST ALLIED I - DIGITAL ELECTRONICS

(For those who joined since 2018-19)

Semester : I **Hours/week: 4**
Subject Code : FBCSA131/ GBITA34/GBCSA13 **Credits: 3**

Course Outcomes:

CO 1: Understand basic knowledge about number systems and codes
CO 2: Able to know the basic Boolean operations
CO 3: Know the concepts of combinational logic and sequential circuits

CO 4: Ability to understand memory concepts

UNIT I **[12 Hours]**

Number Systems and Codes: Introduction - binary, octal, decimal, and hexadecimal number system - Decimal to binary, octal to binary, hexadecimal to binary - Hexadecimal to octal conversions and vice versa - Binary arithmetic - 1s and 2s complement representations - BCD addition and subtraction - Weighted and un - Weighted codes - Alphanumeric codes.

UNIT II **[12 Hours]**

Basic Boolean functions: AND, OR, NOT Functions - Boolean theorems and laws - Use of Boolean algebra for simplification of logical expressions - Minterm and maxterm - Canonical sum of products and product of sum simplifications - Minimization of logical expressions using K-map - Logic gates - AND, OR, NOT, EX-OR, NAND, NOR gates - Realisation of logic functions.

UNIT III **[12 Hours]**

Introduction to combinational logic circuits: arithmetic circuits - Half adder, full adder, half subtractor, full subtractor, parallel binary adder - Subtractor, serial adder, multiplier and divider -encoder, decoder.

UNIT IV **[12 Hours]**

Introduction to sequential circuits: Flipflops - SR, JK, D and T flipflops - Master-slave flip flops - Level and edge triggering - Synchronous and asynchronous counters - Up/down counters - Modulo-n-counters - Shift registers - Serial in serial out - Serial in parallel out, parallel in serial out and parallel in parallel out shift counters - Ring counters.

UNIT V **[12 Hours]**

Read only memory: Architecture of ROM, PROM, EPROM, EEPROM, ROM applications - RAM - RAM architecture - Static and dynamic RAM.

Text Book

1. Salivahanan S, Arivazhagan S, **Digital Circuits and Design**, Vikas publishing house, New Delhi, Second Edition, 2000

References

2. Morris M. Mano, **Digital Logic and Design**, Prentice Hall of India Pvt. Ltd., New Delhi, Fourth Edition, 2013
3. Malvino, Leach, **Digital Principles and Applications**, Tata McGraw–Hill Edition, New Delhi, Second Edition, 2006

FIRST ALLIED II - DIGITAL ELECTRONICS LAB

(For those who joined since 2018-19)

Semester : I **Hours/week: 2**
Subject Code : FBCSA141P/ GBITA35P/GBCSA14P **Credits : 2**

Course Outcomes:

CO 1: Implement logic functions
CO 2: Able to build circuits, truth tables, and Boolean algebra expressions
CO 3: Apply the laws of Boolean algebra to simplify circuits and Boolean algebra expressions
CO 4: Implement combinational logic circuits

Logic Gates

1. Verification of AND Gate using ICs
2. Verification of OR Gate using ICs
3. Verification of NOT Gate using ICs
4. Verification of NAND Gate using ICs
5. Verification of NOR Gate using ICs
6. Verification of EX-OR Gate using ICs

Universal Gates

7. Universality of NAND gates using IC 7400

8. Universality of NOR gates using IC 7402

Boolean algebra and Therorem

9. Verification of Boolean Expression using ICs
10. Verification of Demorgan's theorems using ICs

Adder and Subtractor

11. Binary half and full adder using ICs
12. Binary half and full subtractor using ICs

Diodes Characteristics

13. V-I Characteristics of a PN junction diode
14. V-I Characteristics of a Zener diode

Note: - Questions for the Internal/External Examinations shall be based on the concepts learnt

SKILL BASED ELECTIVE - MULTIMEDIA LAB – I (PHOTOSHOP)

(For those who joined since 2018-19)

Semester : I **Hours/week: 2**
Subject Code : FBCSE151P/GBCSE15P **Credits: 2**

Course Outcomes:

CO 1: Gain a working knowledge various tools available in toolbar
CO 2: Able to create, modify, resizing, and adjusting resolution of image
CO 3: Creating own design like student_ID card, visiting card and greeting card
CO 4: Students will be able to convert image into pencil drawing

Converting the image

1. Design a Visiting card
2. Design your ID card
3. To convert picture into pencil drawing
4. Design scenery using special effect brushes
5. Design a greeting card using assorted brushes with lighting effect
6. Design a text using clipping mask
7. Design an image and change the image size and rotate the image to 90 degree

Tools

8. Design a picture using variety of lasso tool
9. Design a picture using magic wand tool to change color
10. Design a picture using history brush tool
11. Design a picture and use the following

i) blur ii) dodge iii) sponge iv) burn v) smudge vi) sharpen

Special Effects

12. Design a picture using shadow effect
13. Design a banner using clone stamp tool and Text effect
14. Design a picture using blending and mask effects
15. Design a picture using mirror effects

Note: Questions for the Internal/External examination will be based on the concepts learnt

CORE III - PROGRAMMING IN C

(For those who joined since 2018-19)

Semester : II **Hours/week: 4**
Subject Code : FBCSC212/GBCSC21 **Credits: 3**

Course Outcomes:

CO 1: Understand brief outline of C and its instruction
CO 2: Acquire knowledge about control statements and functions
CO 3: Familiarize with arrays, structures and unions
CO 4: Know key concept of file and preprocessors

UNIT I **[12 Hours]**

Introduction To C Programming: Types of programming languages - Introduction to C - The C character set - Writing first program of C - Identifiers and keywords - Compiling and executing the program - Datatypes - Constants- Variables and arrays - Declarations - Expressions - Statements - Symbolic constants. **Operators and Expressions:** Arithmetic operators - Unary operators - Relational and logical Operators - Assignment operators - The conditional operator - Library functions. **Program Structure:** Storage classes - Automatic variables - External (Global) variables- Static variables

UNIT II **[12 Hours]**

Control Statements: if-else statement - While statement - Do-while statement - For statement - Nested control structures - Switch statement - Break statement - Continue statement - Comma Operator - Goto statement - **Functions:** Defining a function - Accessing a function - Function prototypes - Passing arguments to a function - Recursion

UNIT III **[12 Hours]**

Arrays: Defining an array - Processing an array - Passing arrays to functions - Multidimensional arrays - **Pointers:** Fundamentals - Pointer declarations - Passing pointers to a function - Pointers and one-dimensional arrays - Dynamic memory allocation - Operations on pointers - Pointers and multidimensional arrays - Arrays of pointers - Passing function to other Functions - More about pointer declarations

UNIT IV **[12 Hours]**

Structures and Unions: Defining a structure - Processing a structure - User-defined data types - Structures and pointers - Passing structures to functions - Self-referential structures - Unions

UNIT V **[12 Hours]**

File Handling: Why Files - Opening and closing a data file - Reading and writing a data file - Processing a data file - Unformatted data files - Concept of binary files - Accessing the file randomly. **Additional Features of C:** Command Line Parameters - Macros - The C pre-processor

Text Book

1. Byron Gottfried, **Programming with C**, Tata McGraw Hill Education, New Delhi, Third Edition, 2011.

References

2. Kernighan, Brian W, Ritchie, Dennis, **C Programming Language**, Prentice Hall, Second Edition, 2007
3. Yashavant Kanetkar, **Let Us C**, BPB Publications, New Delhi, 15th Edition, 2017.
4. K R Venugopal, Sudeep R Prasad, **Programming with C**, Tata McGraw Hill Education, New Delhi, 2007
5. E Balagurusamy, **Programming in ANSI C**, Tata McGraw-Hill Education , New Delhi, Third Edition, 2015

CORE IV - PROGRAMMING IN C LAB

(For those who joined since 2018-19)

Semester : II **Hours/week: 4**
Subject Code : FBCSC221P/GBCSC22P **Credits: 3**

Course Outcomes:

CO 1: Work with textual information, character and strings and work with arrays
CO 2: Develop iteration/ decision making codes
CO 3: Develop program with minimal lines using functions
CO 4: Develop pointer based programs and to handle possible errors during program execution

Formula Substitution

1. Write a C program to check whether the given number is odd or even
2. Write a C program to check whether given number is prime or not
3. Write a C program to check whether a given number is armstrong or not
4. Write a C program to check whether a given number is perfect or not
5. Write a C program check whether the given number is palindrome or not

6. Write a C program to generate Fibonacci series
7. Write a C program to generate prime number within range

Functions

8. Write a C program to find the area of various shapes using functions
9. Write a C program to find the factorial of a given number using recursion function

Arrays

10. Write a C program to check whether the element is present in the given list or not
11. Write a C program to sort numbers in ascending and descending order
12. Write a C program to sort names in Alphabetical order
13. Write a C program to Multiplication of two matrix

Pointers

14. Write a C program to perform arithmetic operations using pointer
15. Write a C Program to swapping of two numbers using pass by reference

Structures

16. Write a C program to prepare student mark list using structure
17. Write a C program to prepare electricity bill using union

Files

18. Write a C program to searching a book available from the library file

Note: - Questions for the Internal/External examination will be based on concept learnt

FIRST ALLIED III - MICROPROCESSOR

(For those who joined since 2018-19)

Semester : II **Hours/week: 4**
Subject Code : FBCSA231/ GBITA44/GBCSA23 **Credits: 3**

Course Outcomes:

CO 1: Understand the basic concept of 8088/8086 microprocessor, registers and addressing mode
CO 2: Acquire knowledge instruction sets and programming structure
CO 3: Know the min & max mode interface signals, bus cycle and system clock
CO 4: Familiarity of architecture and Pentium microprocessor family

UNIT I **[12 Hours]**

Software Architecture of the 8088 and 8086 Microprocessors: Introduction - Micro architecture of the 8088/8086 Microprocessor- Software Model 8088/8086 Microprocessor - memory address space and data organization - Data types - Segment registers and Memory segmentation - Dedicated, reserved, and general use memory - Instruction Pointer- Data registers - Pointers and Index registers - Status Registers - Generating a Memory address - Addressing modes.

UNIT II **[12 Hours]**

8086/8088 Programming: Instruction set of 8088/8086: Data Transfer, Arithmetic, Logic, Shift, Rotate instructions - Compare instructions - Control flow and Jump instructions - Loops and loop handling instructions - Strings and String handling instruction.

UNIT III **[12 Hours]**

Memory Interfaces: Minimum mode and Maximum mode Systems - Minimum and Maximum system mode interface signals - System Clock - Bus Cycle-Memory Control signals-Read and Write Bus cycle - Memory Interface Circuits.

UNIT IV **[12 Hours]**

I/O Interface: Types of I/O - Isolated Input/Output Interface - Input and Output data transfer - I/O instructions- Input and Output Bus cycles.

UNIT V **[12 Hours]**

Interrupt Interface of the 8088 and 8086 Microprocessors: Interrupt mechanism, types, and priority - Interrupt Vector table- Interrupt instructions - Enabling/disabling of interrupts - External Hardware interrupt interface signals - 82C59A Programmable Interrupt Controller - Software Interrupts.

Advanced Microprocessor: Introduction about 80386 Microprocessor family, 80486 Microprocessor family, and Pentium Microprocessor family.

Text Book

1. Walter A Triebel, Avtar Singh, **The 8088 and 8086 Microprocessors Programming, Interfacing, Software, Hardware and Applications,** Pearson Education, New Delhi, Fourth Edition, 2003

References

2. Aditya P Mathur , **Introduction to Microprocessor,** McGraw Hill Publishing Company Ltd, New Delhi, Third Edition, 2004
3. Charles M Gilmore, **Microprocessors Principles and Applications**, Tata McGraw Hill Publishing Company Ltd., New Delhi, Second Edition, 2003

FIRST ALLIED IV- MICROPROCESSOR LAB

(For those who joined since 2018-19)

Semester : II **Hours/week: 2**
Subject Code : FBCSA241P/ GBITA45P/GBCSA24P **Credits: 2**

Course Outcomes:

CO 1: Solve the basic binary operations
CO 2: Demonstrate programming using the various addressing modes & data transfer instructions
CO 3: Implement number checking and string manipulations
CO 4: Implement interfacing programs

8086 MICROPROCESSOR

Arithmetic Operations

1. Addition / Subtraction of 8/16 bit Data
2. Multiplication / Division of 8 bit Data

Formula Substitution

3. Smallest / Largest of N Numbers
4. Sum of Odd/Even Numbers
5. Factorial of a Number
6. Fibonacci Series

Binary Conversion

7. One's complement and Two's complement of given numbers

Array

8. To arrange numbers in ascending / descending order

String Manipulation

9. Program for searching for a number or character in a string for 8086.
10. Program for String manipulations for 8086.

Interfacing

11. Program for digital clock design using 8086
12. Interfacing ADC to 8086
13. Interfacing DAC to 8086
14. Interfacing stepper motor to 8086

Note: - Questions for the Internal/External examination will be based on concept learnt

SKILL BASED ELECTIVE - MULTIMEDIA LAB – II (FLASH)

(For those who joined since 2018-19)

Semester : II **Hours/week: 2**
Subject Code : FBCSE251P/GBCSE25P **Credits: 2**

Course Outcomes:

CO 1: Able to use different tools of flash player to create an effective animated picture
CO 2: Understand how to combine multiple pictures and make them to animate for a specified duration
CO 3: Learn to deal with frames for the pictures of an animated scene

CO 4: Demonstrate various animation objects

Key Frame

1. Draw a melting candle with animation
2. Animate a Doll movement
3. Design a running clock with animation

Motion Tween

4. Display the Ball bouncing
5. Draw a bird to lay egg and to hatch it with animation
6. Animate the working of Solar System
7. Draw the natural scenery along with the movement of bird
8. Design an animated Logo
9. To animate the life cycle of the Butterfly
10. To animate the scene " Tree growing from the seed"
11. To animate the scene " Leaves falling down from the tree"
12. To animate a cartoon picture
13. Draw the multicolored fishes that jumps in and out of water in the tank
14. Animate a Vehicle in the Path

Note: - Questions for the Internal/External examination will be based on the concepts learnt

CORE V - PROGRAMMING IN C++

(For those who joined since 2018-19)

Semester : III **Hours/week: 6**
Subject Code : FBCSC311/GBCSC31 **Credit: 4**

Course Outcomes:

CO 1: Understand the basic concept of C++, tokens, expression and control structures
CO 2: Knowledge about object oriented concept
CO 3: Implement constructors, destructors, type conversion and inheritance concepts
CO 4: Understand the memory access and manipulation using pointers, working with files and exceptions

UNIT I **[18 Hours]**

Principles of Object Oriented Programming - Beginning with C++ - Introduction to C++ - Tokens, Expressions and Control Structures.

UNIT II **[18 Hours]**

Classes and Objects: Introduction, C Structures Revisited - Specifying a Class - Defining Member Functions - A C++ Program with Class - Making an Outside Function Inline - Nesting of Member Functions - Private Member Functions, Array within a Class - Memory Allocation for Objects - Static Data Members, Static Member Functions - Array of Objects - Objects as Function Arguments - Friendly Functions - Returning Objects - Const Member Functions - Pointer to Member.

UNIT III **[18 Hours]**

Constructor and Destructors: Introduction, Constructors - Parameterized Constructors, Multiple Constructors in a Class - Constructors with Default Arguments - Dynamic Initialization of Objects - Copy Constructor - Dynamic Constructors - Constructing Two-Dimensional Arrays - Destructors. **Operator Overloading and Type Conversion :** Introduction, Defining Operator Overloading - Overloading Unary - Binary Operators- Overloading Binary Operators using Friends - Manipulation of Strings using Operators- Rules for Overloading Operators - Type Conversions. **Inheritance:** Introduction - Defining Derived Class - Single Inheritance - Making Private Member Inheritable - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance, Hybrid Inheritance - Virtual Base Class - Abstract Classes - Constructors in Derived Classes - Nesting of Classes.

UNIT IV **[18 Hours]**

Pointers, Virtual Functions and Polymorphism: Introduction - Pointers to Objects - this Pointer - Pointer to Derived Classes - Virtual Functions - pure Virtual functions. **Working with files:** Introduction -

classes for file stream operations- opening and closing a file - Detecting End - of file - more about open (): File modes - file pointers and their manipulations - sequential input and output operations – updating a file : - Random Access - Error Handling During file operations - command line arguments.

UNIT V **[18 Hours]**

Templates: introduction - class Templates - class templates - class templates with multiple parameters- function templates - function templates with multiple parameters - overloading of template functions - member function templates - non-type template arguments. **Exception Handling:** Introduction - Basics of Exception Handling - Exception Handling Mechanism- throwing Mechanism-catching mechanism - rethrowing an exception- specifying exceptions.

Text Book

1. Balagurusamy E, **Object Oriented Programming with C++**, Tata McGraw-Hill Publishing Company Limited, New Delhi, Fourth Edition, 2008.

References

2. Ivor Horton , **Beginning C++ The Complete Language**, Shroff Publishers and Distributors Pvt. Ltd., Bangalore, 2007
3. Venugopal K R, Rajkumar B, and RaviShankar T, **Mastering C++**, Tata McGraw Hill, New Delhi, Fifth Reprint, 2006

CORE VI - PROGRAMMING IN C++ LAB

(For those who joined since 2018-19)

Semester : III **Hours/week: 6**
Subject Code : FBCSC321P/ FBITC33P/GBCSC32P **Credit: 4**

Course Outcomes:

CO 1: Able to create basic checking program
CO 2: Demonstrate the OOPs related program
CO 3: Implement file program
CO 4: Know to handle exception

Formula Substitution

1. Write a C++ program to check a given number is odd or even
2. Write a C++ program to check a given number is palindrome or not using class
3. Write a C++ program to check a given number is armstrong or not using class
4. Write a C++ program to sort the list of numbers using class

Member Functions

5. Write a C++ program to check a given number is positive or negative using function
6. Write a C++ program to find sum of digit using nesting of member function

Constructors

7. Write a C++ program to find reverse of digit using constructor

Overloading

8. Write a C++ program to find area of shapes using function overloading
9. Write a C++ program to demonstrate unary operator using friend function
10. Write a C++ program to add two complex numbers using binary operator overloading

Inheritance

11. Write a C++ program to perform student mark list using single inheritance
12. Write a C++ program to prepare electricity bill using multilevel inheritance

Pointer

13. Write a C++ program to searching an element in the list using pointer
14. Write a C++ program to checking a given number is prime or not using pointer to object

File Handling

15. Write a C++ program to create a new files to store content and display number of words in the files

Exception Handling

16. Write a C++ program to demonstrate user defined exception

Note: - Questions for Internal and External examination will be based on concept learnt

SKILL BASED ELECTIVE - WEB DESIGNING LAB – I (HTML)

(For those who joined since 2018-19)

Semester : III **Hours/week: 3**
Subject Code : FBCSE341P/GBCSE34P **Credits: 2**

Course Outcomes:

CO 1: Know the basic HTMS tags
CO 2: Create own personal web pages
CO 3: Create web pages for own company and institution
CO 4: Demonstrate online dictionary

HTML Tags

1. Creation of hyperlinks in HTML
2. Creation of Lists in HTML
3. Create web site for your company product advertisement in HTML
4. Create your own website for your personal information
5. Linking documents and images
6. Create your company web site using HTML tags
7. Create your college web site using HTML tags

Table

8. Create mark sheet preparation using table

Frame
9. Create online Dictionary using Frames
Style Sheet
10.Create style sheets with the style elements

Note: - Questions for the Internal/External examination will be based on concept learnt

EXTRA CREDIT - LINUX AND SHELL PROGRAMMING LAB

(For those who joined since 2018-19)

Semester : III **Hours/week: -**
Subject Code : FBCSX31/ FBITE15P/GBCSX3P **Credits: 2**

Course Outcomes:
CO 1: Understand the basis of shell scripting
CO 2: Ability to solve problem
CO 3: Gain knowledge of display username and password
CO 4: Learn about usage of various commands

Built-in Commands
1. Write a shell program to use who commands
2. Write a shell program to use list commands
3. Write a shell program to use sort commands
4. Write a shell program to use wc commands
5. Write a shell program to use cat commands

Formula Substitution
6. Write a shell program to find odd or even number
7. Write a shell program to find smallest among three numbers
8. Write a shell program to find the factorial value
9. Write a shell program to display multiplication table

Switch case
10. Write a shell program to use case statement

Functions
11. Write a shell program to display username, pwd using function
12. Find age of a person using set date

Checking
13. To check the given file is a directory or not

String Manipulation
14. Convert lowercase to uppercase using tr statement

Note: - Questions for the Internal/External examination will be based on the concepts learnt

CORE VII - OPERATING SYSTEM

(For those who joined since 2018-19)

Semester : IV **Hours/week: 5**
Subject Code : FBCSC411/ FBITC43/GBCSC41 **Credits: 4**

Course Outcomes:
CO 1: Understand the services provided and design of an OS and able to use system calls
CO 2: Know about process and how process are synchronized and scheduled
CO 3: Differentiate memory management
CO 4: Gain knowledge of dead lock handling algorithm
CO 5: Acquire knowledge of structure of distributed system
CO 6: Gain skill for protection and security problems in operating system

UNIT I **[15 Hours]**

Introduction: What is an Operating System -Mainframe systems- desktop systems- Multiprocessor Systems- Distributed systems- Clustered Systems- Real time systems- Hand held systems

Operating System Structure: System components- Operating System services- System calls- - System structure- Virtual machines

UNIT II **[15 Hours]**

Processes: Process concept- process scheduling- operations on processes- cooperating processes- Inter process Communication

CPU Scheduling: Basic Concepts- Scheduling Criteria- Scheduling algorithms **Process Synchronization**: Background- The critical system problem- semaphores- Classic problems of synchronization- Critical Regions- Monitors

UNIT III **[15 Hours]**

Deadlock: System Model-Deadlock Characterization- Methods of Handling Deadlock-Deadlock Prevention-Deadlock Avoidance- Deadlock Detection- Recovery from Deadlock

Memory management: Background- Swapping- Contiguous memory allocation- Paging- Segmentation- Segmentation with paging

UNIT IV **[15 Hours]**

Virtual memory: Background- Demand paging- process creation- Page replacement

File system interface: File concepts- access methods- Directory structure

Mass storage structure: Disk structure- Disk Scheduling- Disk management- Swap space management- RAID structure

UNIT V **[15 Hours]**

Protection: Goals of protection- domain of protection- Access matrix- Implementation of Access matrix- revocation of access rights

Security: The security problem- User authentication- Program threats- System threats- securing systems and facilities- Intrusion detection- Cryptography

Text Book

1. Silberschatz, Galvin, Gagne, **Operating System Concepts**, Wiley India Pvt. Ltd, NewDelhi, Sixth Edition, 2003

References

2. Milan Milenkovic, **Operating System Concepts & Design,** Tata, McGraw Hill Publishing Limited, NewDelhi,Second Edition,1997
3. Peter Baer Galvin and Robert Neilson Boyd, **Applied Operating system concepts**, John Wiley & Sons, NewDelhi, First Edition, 2000
4. Dhananjay M. Dhamdhere, **Operating System A Concept-Based Approach**, Tata McGraw Hill Publishing Limited, NewDelhi, Third Edition, 2012

CORE VIII - DATA STRUCTURES AND ALGORITHMS

(For those who joined since 2018-19)

Semester : IV **Hours/week: 5**
Subject Code : GBCSC42 **Credit: 4**

Course Outcomes:

CO 1: Understand basics of algorithms and data structures
CO 2: Know the basic concept and types of linked list and trees
CO 3: Acquire skill about graphs
CO 4: Gain knowledge about sorting and searching techniques

UNIT I **[15 Hours]**

Introduction: History of Algorithm - Data structures and Algorithms - Data structure - Definition and Classification.
Stacks: Introduction - stack Operation - Application. **Queues:** Introduction - Operation - circular Queues - Other Types of Queues - Application.

UNIT II [15 Hours]
Linked Lists: Introduction - Singly Linked Lists - Circularly Linked List - Doubly Linked List - Multiply Linked List - Application. **Trees and Binary Tress:** Introduction -Trees: Definition and Basic Terminologies - Representation of Trees -Binary Tree Traversals - Threaded Binary Trees - Applications.

UNIT III [15 Hours]
Graphs: Introduction-Definitions and Basic Terminologies - Representations of Graphs - Graph Traversals - Single-source & All pairs shortest paths problem - Minimum cost spanning trees. **Binary Search Trees and AVL Trees:** Introduction - Binary Search Trees: Definition and Operations - AVL Trees: Definition and Operations - Applications.

UNIT IV [15 Hours]
Red-Black Trees and Splay Trees: Red-Black Trees - Applications. **Hash Tables:** Introduction-Hash Table Structure - Hash Functions - Linear Open Addressing - Chaining - Applications. **Searching:** Introduction - Linear Search - Transpose Sequential Search - Interpolation Search - Binary Search - Fibonacci Search - Other Search Techniques.

UNIT V [15 Hours]
Internal Sorting: Introduction - Bubble Sort - Insertion Sort - Selection Sort - Merge Sort - Shell Sort - Quick Sort - Heap Sort - Radix Sort.
Algorithms: Algorithm Specification - Performance analysis - Asymptotic notation.

Text Book

1. Vijayalakshmi Pai G A, **Data structures and Algorithms, Concepts, Techniques and Application**, Tata McGraw-Hill Education Pvt. Limited, New Delhi, 2008
2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, **Fundamentals of Computer Algorithms**, Second Edition, Universities Press, 2008

Reference

3. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, **Data Structures and Algorithms**, Dorling Kindersley (India) Pvt. Ltd., Noida, 2013
4. Patel R B, **Expert Data Structures with C**, Khanna Book Publishing Co.(p) Limited, New Delhi, Third Edition, 2000

CORE IX - VISUAL PROGRAMMING LAB
(For those who joined since 2018-19)

Semester : IV **Hours/week: 5**
Subject Code : FBCSC431P/GBCSC43P **Credit: 4**

Course Outcomes:
CO1: Acquire the skills for developing event-driven applications
CO2: Implement GUI program using various control in toolbox
CO3: Implement to use databases
CO4: Get knowledge to animate pictures

Formula substitution
1. Write a Visual Basic program to find the simple and compound interest
2. Write a Visual Basic program to perform arithmetic operations
3. Write a Visual Basic program to find the sum of digits
4. Write a Visual Basic program to check whether the given string is palindrome or not
5. Write a Visual Basic program to generate Fibonacci series

Functions substitution

6. Write a Visual Basic program to perform the String Manipulation
7. Write a Visual Basic program to implement all date and time functions

Control

8. Write a Visual Basic program to add an item, delete an item and transfer item from one list to another list
9. Write a Visual Basic program to calculate the age of the person using date control
10. Write a Visual Basic program to change background color of form using scroll bar

Graphics

11. Write a Visual Basic program to animate a picture

Array

12. Write a Visual Basic program to arrange the numbers in order
13. Write a Visual Basic program to arrange the names in alphabetical order

Control arrays

14. Write a Visual Basic program to design a calculator using control arrays

Menu

15. Write a Visual Basic program to prepare an electricity bill using menu
16. Write a Visual Basic program to create own notepad using menu

Database

17. Write a Visual Basic program to prepare student mark list using data control
18. Write a Visual Basic program to prepare pay bill using data control
19. Write a Visual Basic program to create employee details using ADO control

Note: - Questions for the Internal/External examination will be based on the concepts learnt

SKILL BASED ELECTIVE - WEB DESIGNING LAB – II (SCRIPT)

(For those who joined since 2018-19)

Semester : IV **Hours/week: 3**
Subject Code : FBCSE451P/GBCSE45P **Credits: 2**

CO1: Create interactive web page using various tags
CO2: Develop web games
CO3: Create web page to demonstrate buttons
CO4: Design photo gallery web page

Formula Substitution

1. To generate random numbers using VB Script
2. To Check a given number is odd or even using VB Script
3. To Sort the numbers in ascending order using VB Script

Animation

4. To animate a ball using VB Script
5. Create any brainy games using VB Script

Buttons

6. Demonstration of dialog boxes using JavaScript
7. Perform arithmetic operations using JavaScript
8. Create rollover buttons
9. Create login format using arrays in JavaScript
10. Create Photo gallery using java Script with background details

Note: - Questions for the Internal/External examination will be based on the concepts learnt

EXTRA CREDIT - DATA STRUCTURES LAB

(For those who joined since 2018-19)

Semester : IV **Hours/week: -**
Subject Code : GBCSX4P **Credits: 2**

CO 1: Implement stack and queue data structure
CO 2: Implement to conversion of infix to postfix expression
CO 3: Implement linked list

CO 4: Develop program to sorting numbers and searching a number

Arrays
1. Implement stacks
2. Implement queue
3. Convert infix expression to postfix expression

Linked List
4. Implement Singly linked list
5. Implement Doubly linked list

Tree
6. Implement binary traversal
7. Implement graph travels

Searching
8. Searching a number using binary search

Sorting
9. Arrange numbers in descending order using merge sort
10. Arrange numbers in ascending order using quick sort
11. Implement heap sort

CORE X - PROGRAMMING IN JAVA

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Subject Code : FBCSC511/ FBITC53/GBCSC51 **Credits: 3**

Course Outcomes:

CO 1: Gain knowledge about basic Java language syntax and semantics to write Java programs
CO 2: Understand the fundamentals of OOPs
CO 3: Know the principles of inheritance, packages and interfaces
CO 4: Acquire the knowledge about exception handling and applet programming

UNIT I **[12 Hours]**

Fundamentals of Object Oriented Programming: Introduction – object oriented paradigm – basic concepts of oop – benefits of oop – applications of oop –java features –java Versus C and C++ - java and internet – java and WWW – web browsers – java environment – **Overview of Java Language**: Simple java program - more of java – application with two classes – java program structure – java tokens – java statements-implementing a java program - java virtual machine - command line arguments

UNIT II **[12 Hours]**

Constants, Variables, data types: Declaration of variables- giving values to variables – scope of variables –symbolic constants – type casting – getting values of variables – standard default values - **Operators and Expressions**: Arithmetic operators –Relational operators- logical operators – assignment operators – increment and decrement operators –conditional operator – bitwise operator – special operators –arithmetic expressions –evaluation of expressions –precedence of arithmetic operators-type conversion in expression –operator precedence and associativity – mathematical functions. **Decision making and Branching:** If statement –switch - ? : Operator - **Decision Making and Looping:** While statement – do statement – for statement – jumps in loops - labeled loops

UNIT III **[12 Hours]**

Classes, Objects and Methods: Introduction – defining a class –field declaration–methods declaration – creating objects – accessing class members – constructors – methods overloading – static members – nesting of methods – inheritance – overriding methods – final variables and methods – final classes – finalizer methods – abstract methods and classes –visibility control - **Arrays Strings and Vectors** : Arrays –one dimensional array – creating an array –two dimensional arrays –strings –vectors –wrapper classes – **Interfaces, Multiple Inheritance**: defining interfaces – extending interfaces –implementing interfaces – accessing interface variables

UNIT IV **[12 Hours]**

Packages , Putting classes together : Introduction - java API packages –using system packages – naming conventions –creating packages –accessing a package –using a package – adding a class to a package –hiding classes – **Multithreaded Programming** : Creating threads – extending the thread class – stopping and blocking a thread - life cycle of a thread – using thread methods – thread exceptions –thread priority –synchronization –implementing the runnable interface

UNIT V **[12 Hours]**

Managing Errors and Exception: Introduction – types of errors –exceptions –syntax of exception handling code – multiple catch statements –using finally statement –throwing our own exceptions –using exceptions for debugging- **Applet Programming:** Introduction –how applets differ from applications – building applet code –applet life cycle – creating an executable applet –designing a web page - applet tag – adding applet to html file –running the applet – more about applet tags –passing parameters to Applets – aligning the display

Text Book

1. Balagurusamy E, **Programming with Java A Primer**, Tata McGraw-Hill Publishing Company Limited, New Delhi, Third Edition, 2007

References

2. Herbert Schildt, **The Complete Reference Java**, Tata McGraw-Hill publishing Company Limited, New Delhi, Fourth Edition, 2002
3. Bruce Eckel, **Thinking in Java**, Pearson Education, New Delhi, Fourth Edition, 2006

CORE XI - PROGRAMMING IN JAVA LAB

(For those who joined since 2018-19)

Semester : V **Hours/week: 5**
Subject code : FBCSC521P/GBCSC52P **Credits: 4**

Course Outcomes:

CO 1: Gain hands on experience with the basics of Java program
CO 2: Implement multi-threaded programs
CO 3: Handling Exception
CO 4: Acquire skills to implement GUI components (Console and GUI based) and event-driven programming

Checking

1. Write a java program to check a given number is palindrome or not
2. Write a java program to check a given number is prime or not
3. Write a java program to check a given number is perfect or not

Generation

4. Write a java program to generate N Armstrong numbers
5. Write a java program to generate Fibonacci series

Methods

6. Write a java program to find factorial of a given number using method
7. Write a java program to find largest among two numbers using nesting of method
8. Write a java program to find area of different shapes using method overloading

Array

9. Write a java program to sort the list of numbers in ascending order
10. Write a java program to sort the list of names in alphabetical order
11. Write a java program to searching a number in the list
12. Write a java program to perform matrix multiplication

String Manipulation

13. Write a java program to perform string functions using switch-case

Constructor

14. Write a java program to find sum of digits using constructor

Inheritance

15. Write a java program to find area and volume of room using single inheritance
16. Write a java program to enumerate student details using Hierarchical inheritance

Thread

17.Write a java applet program to animate banner using thread

Applet

18. Write a java applet program to draw a human face
19. Write a java applet program to display an image
20. Write a java applet program to perform arithmetic operations
21. Write a java applet program to perform mouse events
22. Write a java applet program to perform key events

JFrame

23. Write a java jframe program to create user login form
24. Write a java jframe program to demonstrate arithmetic exception
25. Write a java jframe program to demonstrate menu
26. Write a java jframe program to store personal information to the database

Note: - Questions for the Internal/External examination will be based on the concepts learnt

CORE XII - RDBMS

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Subject Code : FBCSC532/GBCSC53 **Credit: 3**

Course Outcomes:

CO 1: Able to know the basic concepts of DBMS and RDBMS
CO 3: Understand the concept of distributed and object oriented databases
CO 2: Know about database design and transaction processing management
CO 4: Acquire the knowledge about security in database

UNIT I **[12 Hours]**

Introduction to Database Systems: What is DBMS-File Management Systems (FMS)-Database Management Systems (DBMS)-FMS versus DBMS-An Overview of Database Management-Brief Introduction to SQL-Embedded SQL-Dynamic SQL-DBMS Models-Database System Architecture

UNIT II **[12 Hours]**

The Relational Model: Relational Database Primer-Relational Database Characteristics-Relational Algebra-Relational Calculus-Database Integrity-Keys-Entity and Referential Integrity-Views

UNIT III **[12 Hours]**

Database Design: Design Considerations-Functional Dependency-Normalisation and Normal Forms-Entity/Relationship (E/R) Modeling. **Object Technology and DBMS:** An Introduction to Object Technology-Abstraction-Encapsulation-Inheritance-Object Technology and RDBMS-Object Oriented Database Management System (OODBMS)

UNIT IV **[12 Hours]**

Transaction Processing and Management: Transaction-Recovery-Transaction Models-Two-phase Commit-Concurrency Problems-Locking-Concurrency problems Revisited-Deadlocks-Transaction Serialsability-Two-phase Locking-Isolation Levels

UNIT V **[12 Hours]**

Database Security: Data Classification-Threats and Risks-Cryptography-Digital Signature-Database Control-Users and Database Privilleges-Types of Privilleges-Object Privilleges-Taking Away Privilleges-Filtering Table Privilleges-Statistical Databases

Text Book

1. Atul Kahate, **Introduction to Database Management Systems**, Dorling Kindersley (India) Pvt. Ltd., Noida, Second Edition, 2012.

References

2. Dr. Jain V K, **Advanced Data Base Management System**, Cyber Tech Publications, New Delhi, First Edition 2001.
3. Abraham Silberschatz, Henry Korth F, Sudarshan S, **Database System Concepts**, McGraw-Hill Edition, New Delhi, Fifth Edition , 2006.

ELECTIVE I (a) - WEB TECHNOLOGY

(For those who joined since 2018-19)

Semester : V **Hours/week: 5**
Subject Code : FBCSE51A/GBCSE5A **Credits: 5**

Course Outcomes:

CO 1: Enhance the students to understand Internet protocols, Web clients and Web servers
CO 2: Know the use of XHTML and HTML elements in building a website
CO 3: Understand how to include CSS while creating a website
CO 4: Gain knowledge to include java script to enhance website development
CO 5: Understand the concepts of servlets
CO 6: Obtain knowledge about the role of cookies in website maintenance

UNIT I **[15 Hours]**

Web Essentials: Clients, Servers, and Communication-The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers

UNIT II **[15 Hours]**

Markup Languages: XHTML1.0- An Introduction to HTML History and Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements

UNIT III **[15 Hours]**

Style Sheets - Introduction to Cascading Style Sheets- CSS Core Syntax- Style Sheets and HTML- Style Rule Cascading and Inheritance- Text Properties- CSS Box Model- Normal Flow Box Layout

UNIT IV **[15 Hours]**

Client- Side Programming: The JavaScript Language- History and Versions- Introduction to JavaScript-JavaScript in Perspective-Basic Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Arrays-Built-in Objects-JavaScript Debuggers.

UNIT V **[15 Hours]**

Server-Side Programming: **Java Servlets**- Servlets Architecture Overview- Servlets Generating Dynamic Content-Servlets Life Cycle-Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency

Text Book

1. Jeffrey C. Jackson, **Web Technologies A Computer Science Perspective**, Pearson Education, New Delhi, Sixth Edition, 2006.

References

2. Deitel, Goldberg, **Internet & World Wide Web How to Program**, Pearson Education, New Delhi, Third Edition, 2006.
3. Robert W Sebesta, **Programming the World Wide Web**, Pearson Education, New Delhi, Fourth Edition, 2007.

ELECTIVE I (b) – CLOUD COMPUTING

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Subject Code : FBCSE51B/GBCSE5B **Credits: 5**

Course Outcomes:

CO 1: Know basic of cloud computing
CO 2: Understand the concepts of virtualization
CO 3: Know different types of clouds and its uses in different types of environments
CO 4: Understand basics cloud services
CO 5: Understand Aneka and its implementation to act as a cloud application platform
CO 6: Gain experience to work for cloud services

UNIT I **[12 Hours]**

Defining Cloud Computing: Cloud Types -The NIST model - The Cloud Cube Model - Deployment models - Service models -Examining the Characteristics of Cloud Computing - Paradigm shift -Benefits of cloud computing - Disadvantages of cloud computing - Assessing the Role of Open Standards

Assessing the Value Proposition: Measuring the Cloud's Value - Early adopters and new applications - The laws of cloudonomics - Cloud computing obstacles - Behavioral factors relating to cloud adoption - Measuring cloud computing costs - Avoiding Capital Expenditures - Right-sizing - Computing the Total Cost of Ownership - Specifying Service Level Agreements -Defining Licensing Models

UNIT II **[12 Hours]**

Understanding Cloud Architecture: Exploring the Cloud Computing Stack - Composability - Infrastructure - Platforms - Virtual Appliances - Communication Protocols - Applications - Connecting to the Cloud - The Jolicloud Netbook OS- Chromium OS: The Browser as an Operating System

Understanding Services and Application by Types: Defining Infrastructure as a Service (IaaS) - IaaS workloads - Pods, aggregation, and silos - Defining Platform as a Service (PaaS) - Defining Software as a Service (SaaS) - SaaS characteristics - Open SaaS and SOA - Salesforce.com and CRM SaaS - Defining Identity as a Service (IDaaS) – Define identity - Networked identity service classes - Identity system codes of conduct - IDaaS interoperability - Defining Compliance as a Service (CaaS)

UNIT III **[12 Hours]**

Understanding Abstraction and Virtualization: Using Virtualization Technologies - Load Balancing and Virtualization - Advanced load balancing - The Google cloud - Understanding Hypervisors - Virtual machine types - VMware vSphere -Understanding Machine Imaging-Porting Applications - The Simple Cloud API - AppZero Virtual Application Appliance

Exploring Platform as a Service: Defining Services - Salesforce.com versus Force.com: SaaS versus PaaS - Application development - Using PaaS - Application Frameworks - Drupal - Eccentex AppBase 3.0 - LongJump - Squarespace - WaveMaker - Wolf Frameworks

UNIT IV **[12 Hours]**

Understanding Services Oriented Architecture: Introducing Service Oriented Architecture - Event-driven SOA or SOA 2.0 - The Enterprise Service Bus - Service catalogs - Defining SOA Communications - Business Process Execution Language -Business process modeling -Managing and Monitoring SOA - SOA management tools - SOA security - The Open Cloud Consortium - Relating SOA and Cloud Computing

Managing the Cloud: Administrating the Clouds - Management responsibilities - Lifecycle management - Cloud Management Products -Emerging Cloud Management Standards - DMTF cloud management standards - Cloud Commons and SMI

UNIT V **[12 Hours]**

Understanding Cloud Security: Securing the Cloud - The security boundary - Security service boundary - Security mapping - Securing Data -Brokered cloud storage access - Storage location and tenancy – Encryption - Auditing and compliance - Establishing Identity and Presence - Identity protocol standards - Windows Azure identity standards - Presence

Working with cloud-Based Storage: Measuring the Digital Universe - Cloud storage in the Digital Universe - Cloud storage definition - Provisioning Cloud Storage - Unmanaged cloud storage - Managed cloud storage - Creating cloud storage systems - Virtual storage containers - Exploring Cloud Backup

Solutions - Backup types - Cloud backup features - Cloud attached backup - Cloud Storage Interoperability - Cloud Data Management Interface (CDMI) - Open Cloud Computing Interface (OCCI)

Text Book

1. Barrie Sosinsky, **Cloud Computing Bible**, Wiley Publishing, Inc., Indiana, 2011

References

2. Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, **Cloud Computing Concepts, Technology & Architecture**, Prentice Hall of India Pvt. Ltd., New Delhi, First Edition, 2013
3. Toby Velte,Anthony Velte and Robert Elsenpeter, **Cloud Computing-A Practical Approach**, Tata McGraw Hill, New Delhi, First Edition,2010
4. Rajkumar Buyya, Christian Vecchiola and Thamarai Selvi, **Mastering Cloud Computing,** Tata McGraw Hill, New Delhi, 2013

CLOUD COMPUTING (Lab)

Hours/week: 1

1. Create your Gmail Account
2. Create your own Google documents
3. Save Your Google documents in Google drive
4. Chat with your friends using Google Hangouts
5. Create Your own social networks using Google+
6. Create Your own Blog using Google Blogger and publish your own articles
7. Translate Your document using Google Translator

Note: - Questions for the Internal examination will be based on the concepts learnt

ELECTIVE II (a) – SOFTWARE DEVELOPMENT FRAMEWORK

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Subject Code : FBCSE51C/GBCSE5C **Credits: 5**

Course Outcomes:

CO 1: Understand the basic concepts of .net and different languages
CO 2: Differentiate the value and reference type
CO 3: Acquire the knowledge of class and web controls
CO 4: Know the data base concept with .Net
CO 5: Learn about ADO.NET and its data access
CO 6: Implement console and web application program

UNIT I **[12 Hours]**

The .NET Framework: .Net programming Framework-VB.NET, C#.NET and the .NET Languages-The Common Language Runtime-The .NET Class Library-ASP.NET-Visual Studio .NET.

UNIT II **[12 Hours]**

Learning the .NET Languages: The .NET Languages-Data Types-Declaring Variables-Scope and Accessibility-Variable Operations-Object-Based Manipulation-Conditional Structures-Loop Structures-Functions and Subroutines.

UNIT III **[12 Hours]**

ASP.NET APPLICATIONS: ASP.NET Applications-Code-Behind-The Global.asax Application File-Understanding APS.NET Classes-ASP.NET Configuration.

Web Form Fundamentals: A Simple Page Applet-A Deeper Look at HTML Control Classes-The Page Class-Accessing HTML Server Controls.

UNIT IV **[12 Hours]**

Validation and Rich Controls: Validation-simple Validation Example-Understanding Regular Expressions Other Rich Controls.

Using Visual Studio .NET: The promise of Visual Studio.NET-Starting a Visual Studio.Net Project – The Web form Designer-Writing Code-Visual Studio.NET Debugging-Working Without Visual Studio.NET

UNIT V **[12 Hours]**

Overview of ADO.NET: Introducing ADO.NET and Data Management-Characteristics of ADO.Net-The ADO.NET Object Model.

ADO.NET Data Access: About the ADO.NET Examples-SQL Basics-The SQL Select Statement-Update-Insert-Delete-Accessing Data the Easy Way-Creating a connection-Defining a Select Command-Using a Command with a Data Reader-Updating Data-Accessing Disconnected Data-Selecting Multiple Tables-Modifying Disconnected Data-Updating Disconnected Data

Text Book

1. Matthew MacDonald, **The Complete Reference ASP.NET**, Tata McGraw-Hill Publishing Company Ltd, New Delhi, Nineteenth reprint, 2002.

References

2. Dino Esposito, **Programming Microsoft ASP.NET**, Tata McGraw-Hill publishing Company Ltd., New Delhi, Second Edition, 2003
3. Chris Ullman, John Kauffman, Chris Hart, David Sussman, **Beginning ASP.Net 1.1 with VB.NET**, Wiley Publishing Inc, New York , First Edition, 2003.
4. Elliotte Rusty Harold , **XML 1.1 Bible** , Wesley Publications, Boston, Third Edition, 2003

SOFTWARE DEVELOPMENT FRAMEWORK (Lab)

Hours/week: 1

Console Application

1. Create a console application program to checking a given number is prime or not
2. Create a console application program to checking a given number is armstrong or not
3. Create a console application program to sort the numbers in ascending order

Windows Application

4. Create a windows application program to prepare the student mark list
5. Create a windows application program to calculate the area of circle, sphere, rectangle, triangle using drop down list

Webpage

6. Design a webpage for login page including validation and database connection
7. Design a webpage for your college
8. Design a webpage for dictionary
9. Design an advertisement for a company

Note: - Questions for the internal examination will be based on the concepts learnt

ELECTIVE II (b) - PHP

(For those who joined since 2018-19)

Semester : V **Hours/week: 4**
Subject Code : FBCSE51D/GBCSE5D **Credits: 5**

Course Outcomes:

CO 1: Understand basics of PHP
CO 2: Knowledge about variables and data types
CO 3: Learnt about control structures
CO 4: Acquire knowledge about Arrays and user defined functions
CO 5: Understand files and databases
CO 6: Implement interactive web pages

UNIT I **[12 Hours]**

Introducing PHP-History- Unique features-Basic development concepts-creating your first PHP Script-writing and running the script-understanding the script-handling script errors

UNIT II **[12 Hours]**

Storing data in variables-assigning values of variables-destroying variables-inspecting variable contents-**understanding PHP's data types**-setting and checking variables data types-using constants –manipulating variables with operators.

UNIT III **[12 Hours]**

Controlling program flow-writing simple conditional statements-the if statement-the if-else statement-writing more complex conditional statements-the if - elseif statement-the switch-case statement-combining conditional statements-repeating actions with loops-working with string and numeric functions.

UNIT IV **[12 Hours]**

Working with arrays-storing data in arrays-processing arrays with loops and iterators-using arrays with forms-working with array functions-working with date and times-creating User-defined functions-creating classes-using advanced OOP concepts.

UNIT V **[12 Hours]**

Working with files and directories-reading files-writing files-processing directories-performing other file and directory operations-working with databases and SQL-**introducing databases and SQL**-using PHP's MySQLi extension-adding or modifying data-handling errors

Text Book

1. Vikram Vaswani, **PHP: A Beginner's Guide**, Tata McGraw-Hill, New Delhi, Second Edition, 2009

References

2. Steven Holzner, **PHP: The Complete Reference**, Tata McGraw-Hill, New Delhi, Second Edition, 2007
3. Larry Ullman, **PHP Advanced and Object-Oriented Programming: Visual QuickPro Guide**, *Pearson Education, New Delhi, Third Edition, 2013*

PHP (Lab)

Hours/week: 1

Formula substitution

1. Write a PHP page to perform Arithmetic operation
2. Write a PHP page to check whether the given string is Palindrome or not
3. Write a PHP page to find whether the given number is Prime or not

Tags

4. Create a PHP page for displaying the personal information by using various tags
5. Create a PHP page to advertise a product of the company using images and audio

Built-in Functions

6. Design a PHP page to implement string functions
7. Design a PHP page to implement number functions

File

8. Design a PHP page to read and write data to the file

Database

9. Write a PHP page to enumerate student mark list using database.

Note: - Questions for the Internal examination will be based on the concepts learnt

SKILL BASED ELECTIVE - RDBMS LAB

(For those who joined since 2018-19)

Semester : V **Hours/week: 3**
Subject Code : FBCSE541P/GBCSE54P **Credits: 2**

Course Outcomes:

CO 1: Gain hands on experience with MySQL queries
CO 2: Create queries to use DDL, DML and TCL queries
CO3: Implement built-in functions
CO4: Implement constrains

DDL

1. Create MySQL Library table with fields BookNo, BookName, AuthorName, Number of Copy and Price to illustrate all DDL queries

DML

2. Create MySQL student table with fields Regno, Name, Tamil, English, Maths, Total,Average and Result to illustrate DML queries
3. Create a table in MySQL for an Institution to show their fee particular for various departments in the institution

TCL

4. Create MySQL table to illustrate TCL queries

Operator

5. Create an item table with the fields itemno, itemname, quantity & price and insert records. Illustrate the comparison operators
6. Create a table and illustrate set operators

Built-in Function

7. Create MySQL queries to illustrate String functions
8. Create MySQL queries to illustrate Aggregate functions
9. Create MySQL queries to illustrate Date functions
10. Create MySQL queries to illustrate Number functions

Constraints

11. Create a student table in MySQL using Create command with fields RegNo as primary key, Student_Name, Mark1, Mark2, Mark3, Total, Result as its attribute.
12. Create an organization table in MySQL for with Empno, Empname, Empdept and sort them according to the empname

Group by Clause

13. Create a player table with fields name, sports (cricket, hockey, etc.), age & country

a) Find out the eldest and youngest player
b) Group players according to sports
c) Group player according to country
d) List out the Indian players

Join

14. Create two tables and illustrate joining of tables

Sub query

15. Create a table and illustrate subqueries

Note: - Questions for the Internal/External examination will be based on the concepts learnt

CORE XIII - SOFTWARE ENGINEERING

(For those who joined since 2018-19)

Semester : VI **Hours/week: 5**
Subject Code : FBCSC611/ FBITC61/GBCSC61 **Credits: 4**

Course Outcomes:

CO1: Plan a software project
CO2: Identify the requirement and analyse the cost
CO3: Familiarity to implement code
CO4: Ability to perform test, maintenance and to assure the quality of software

UNIT I **[15 Hours]**

Introduction: Introduction to software engineering – some definitions – some size factors-quality and productivity factors – managerial issues

Planning a software project: Defining the problem– developing a solution strategy – planning the development process – planning an organizational structure- other planning activities

UNIT II **[15 Hours]**

Software Cost Estimation: software cost factors- software cost estimation techniques- estimating software maintenance costs

Software Requirements Definition: The software requirements specification- formal specification techniques

UNIT III **[15 Hours]**

Software Design: Fundamental design concepts – modules and modularization criteria-design notations-design techniques – detailed design considerations- realtime and distributed system design-test plan – milestones, walkthroughs and inspections- design guidelines

Software Implementation: Structured coding techniques – coding style – standards and guidelines

UNIT IV **[15 Hours]**

Software Testing: A Strategic approach to software testing – strategic issues – unit testing –integration testing - validation testing – system testing – the art of debugging

Software Maintenance: Enhancing maintainability during development- managerial aspects of software engineering-configuration management – source code metrics-other maintenance tools and techniques

UNIT V **[15 Hours]**

Software Quality Assurance: Quality concepts – software quality assurance- software reviews – formal technical reviews-statistical quality assurance-the SQA plan – the ISO 9000 quality standards

Text Book

1. Richard E. Fairley, **Software Engineering Concepts**, Tata McGraw-Hill Publishing Company Ltd, New Delhi, Second Edition, 2004

References

2. Roger S. Pressman, **Software Engineering – A Practitioner's approach** , McGraw-Hill, New Delhi, Eighth Edition, 2014
3. Pankaj Jalote, **An Integrated Approach to Software engineering**, Narosa Publishing House, New Delhi, Third Edition, 2005
4. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli**, Fundamentals of Software Engineering**, Prentice Hall of India Pvt. Ltd., New Delhi, Second Edition, 2001

CORE XIV - COMPUTER NETWORKS

(For those who joined since 2018-19)

Semester : VI **Hours/week: 5**
Subject Code : FBCSC621/ FBITC62/GBCSC62 **Credits: 4**

Course Outcomes:

CO1: Define and distinguish different network models
CO2: Gain knowledge about Transmission media
CO3: Understand how error detection and correction is performed
CO4: Identify Address mapping and multicasting and perform congestion control and remote login

UNIT I **[15 Hours]**

Introduction: Data communications - Networks - The Internet

Network Models: Layered Tasks - The OSI model - Layers in the OSI model - TCP/IP Protocol suite - Addressing

UNIT II **[15 Hours]**

Physical Layer: Transmission Media: Transmission media: Guided media - Unguided media
Switching: Circuit switched networks - Datagram networks - Virtual circuit networks
Using Telephone and cable networks for data transmission: Telephone network - Cable TV networks

UNIT III **[15 Hours]**

Data Link Layer: Error Detection and Correction: Introduction - Block coding - Linear block codes - Cyclic Codes - Checksum
Data Link Control: Framing - Flow and Error control - Protocols - Noiseless channels - Nosy channels - Point-to-point protocol
Ethernet: IEEE Standards - Standard Ethernet - Faster Ethernet - Gigabit Ethernet

UNIT IV **[15 Hours]**

Network Layer: Network Layer: IPV4 Addresses - IPV6 Addresses
Internet Protocol: Internetworking - IPV4 - IPV6
Address Mapping, Error Reporting, and Multicasting: Address Mapping - ICMP - IGMP

UNIT V **[15 Hours]**

Transport Layer: Process - To Process Delivery: UDP, TCP: User Datagram Protocol (UDP) - TCP
Congestion Control and Quality of Service: Data traffic - Congestion - Congestion Control -Quality of Service - Technique to improve QoS
Application Layer: Domain Name System: Name space - Domain name space - DNS in the Internet - DNS messages
Remote Logging, Electronic Mail, and File Transfer: Remote Logging - Electronic Mail - File Transfer
WWW and HTTP: Architecture - Web Document - HTTP

Text Book

1. Behrouz A Forouzan, **Data Communications & Networking**, Tata McGraw Hill, New Delhi, Fourth Edition, 2003

References

2. Andrew S Tanenboum, **Computer Networks**, Prentice Hall of India Pvt. Ltd., New Delhi, Fourth Edition, 2007
3. Douglas E Comer, **Computer Networks and Internets**, Pearson Education, New Delhi, Fourth Edition, 2004

CORE XV – OPEN TECHNOLOGY

(For those who joined since 2018-19)

Semester : VI **Hours/week: 5**
Subject Code : GBCSC63 **Credits: 4**

Course Outcomes:

CO1: Acquire the skills for fundamentals, types and variable
CO2: Knowledge to use control structures
CO3: Learnt about lists, dictionary, function, files and exceptions
CO4: Get knowledge about GUI and graphics

UNIT I **[15 Hours]**

Getting Started: Introducing Python - Setting Up Python on Windows - Setting Up Python on Other Operating Systems - Introducing IDLE - **Types, Variables, and Simple I/O:** Using Quotes with Strings - Using Escape Sequences with Strings - Concatenating and Repeating Strings - Working with Numbers - Understanding Variables - Getting User Input - Using String Methods - Using the Right Types - Converting Values

UNIT II **[15 Hours]**

Branching, while Loops, and Program Planning: Generating Random Numbers - Using the if Statement - Using the else Clause - Using the elif Clause - Creating while Loops - Avoiding Infinite Loops - Treating Values as Conditions - Creating Intentional Infinite Loops - Using Compound Conditions - Planning Your Programs - **For Loops, Strings, and Tuples:** Using for Loops - Counting with a for Loop - Using Sequence Operators and Functions with Strings -Indexing Strings - Understanding String Immutability - Building a New String - Slicing Strings -Using Tuples

UNIT III **[15 Hours]**

Lists and Dictionaries: Using Lists - Using List Methods - Understanding When to Use Tuples Instead of Lists - Using Nested Sequences - Understanding Shared References - Using Dictionaries - **Functions:** Creating Functions - Using Parameters and Return Values - Using Keyword Arguments and Default Parameter Values - Using Global Variables and Constants - **Files and Exceptions:** Reading from Text Files - Writing to a Text File - Storing Complex Data in Files - Handling Exceptions

UNIT IV **[15 Hours]**

Software Objects: Understanding Object-Oriented Basics -Creating Classes, Methods, and Objects - Using Constructors - Using Attributes - Using Class Attributes and Static Methods - Understanding Object Encapsulation - Using Private Attributes and Private Methods - Controlling Attribute Access - **Object-Oriented Programming:** Sending and Receiving Messages - Combining Objects - Using Inheritance to Create New Classes - Extending a Class through Inheritance - Altering the Behavior of Inherited Methods - Understanding Polymorphism - Creating Modules

UNIT V **[15 Hours]**

GUI Development: Understanding Event - Driven Programming - Using a Root Window - Using Labels-Using Buttons - Creating a GUI Using a Class - Binding Widgets and Event Handlers - Using Text and Entry Widgets and the Grid Layout Manager - Using Check Buttons - Using Radio Buttons - **Graphics:** Creating a Graphics Window - Setting a Background Image - Understanding the Graphics Coordinate System - Displaying a Sprite - Displaying Text - Displaying a Message - Moving Sprites-Dealing with Screen Boundaries - Handling Mouse Input - Detecting Collisions - **Sound, Animation, and Program Development:** Reading the Keyboard - Rotating a Sprite - Creating an Animation - Working with Sound and Music

Text Book

1. Michael Dawson, **Python Programming for the Absolute Beginner**, Course Technology, a part of Cengage Learning, USA, Third Edition, 2010

References

2. Mark Lutz, **Learning Python**, O'Reilly Media, Inc, USA, Fifth Edition, 2013
3. Allen Downey, **Think Python**, Green Tea Press, Second Edition, 2015
4. Martin C. Brown, **Python: The Complete Reference** , Osborne/McGraw-Hill, USA, 2001

CORE XVI - PROJECT

(For those who joined since 2018-19)

Semester : VI **Hours/week: 6**
Subject Code : GBCSC64PW **Credits: 4**

Course Outcomes:

CO 1: Analytically collect requirements, plan, analyze, design, construct and test the code
CO 2: Solve real time problems
CO 3: Make decisions effective and efficient and document the various aspects of software development
CO 4: Enhance team building skills

Project shall be a group project (group consists of maximum of two members)

ELECTIVE III (a) – MOBILE APPLICATION DEVELOPMENT

(For those who joined since 2018-19)

Semester : VI **Hours/week: 4**
Subject Code : FBCSE61A/GBCSE6A **Credits: 5**

Course Outcomes:

CO 1: Know the history of mobile and its ecosystem
CO 2: Understand designing context, mobile strategy and types of mobile application
CO 3: Gain knowledge about mobile information architecture and its design
CO 4: Know about mobile 2.0, mobile web development and iphone web apps
CO 5: Understand adapting device strategies and supporting devices
CO 6: Create mobile application simulations

UNIT I **[12 Hours]**

A Brief History of Mobile: In the Beginning -The Evolution of Devices - **The Mobile Ecosystem:** Operators -Networks -Devices -Platforms - Operating Systems -Application Frameworks. **Why Mobile** : Size and Scope of the Mobile Market- The Addressable Mobile Market- Mobile As a Medium.

UNIT II **[12 Hours]**

Designing for Context: Thinking in Context -Taking the Next Steps. **Developing a Mobile Strategy:** New Rules. **Types of Mobile Applications**: Mobile Application Medium Types.

UNIT III **[12 Hours]**

Mobile Information Architecture: Define Information Architecture-Mobile Information Architecture - The Design Myth. **Mobile Design**: Interpreting Design-The Mobile Design Tent-Pole-Designing for the Best Possible Experience-The Elements of Mobile Design -Mobile Design Tools -Designing for the Right Device -Designing for Different Screen Sizes. **Mobile Web Apps Versus Native Applications**: The Ubiquity Principle - When to Make a Native Application - When to Make a Mobile Web Application.

UNIT IV **[12 Hours]**

Mobile 2.0: Define Mobile 2.0 -Mobile 2.0. **Mobile Web Development:** Web Standards -Designing for Multiple Mobile Browsers –Device Plans -Markup - CSS: Cascading Style Sheets- JavaScript. **iPhone Web Apps:** WebKit- Makes It a Mobile Web App- Markup- CSS- JavaScript- Creating a Mobile Web App- Web Apps As Native Apps -PhoneGap -Tools and Libraries.

UNIT V **[12 Hours]**

Adapting to Devices: Define Adaptation a "Necessity"- Strategy #1: Do Nothing- Strategy #2: Progressive Enhancement- Strategy #3: Device Targeting- Strategy #4: Full Adaptation- What Domain Do I Use. **Making Money in Mobile:** Working with Operators- Working with an App Store- Add Advertising- Invent a New Model. **Supporting Devices**: Having a Device Plan- Device Testing- Desktop Testing- Usability Testing.

Text book

1. Brain Fling, **Mobile Design and Development**, O'Reilly Media, USA, First Edition, 2009.

References

2. James Pearce, **Professional Mobile Web Development With Wordpress, Joomla, And Drupal** , Wiley India Pvt. Ltd., New York, First Edition, 2011
3. Adrian Kosmaczewski, **Mobile Java script Application Development**, O'Reilly Media, USA, First Edition, 2012.

MOBILE APPLICATION DEVELOPMENT (Lab)

Hours/week: 1

1. Simulate mobile application to send "hello" message from one to another
2. Simulate mobile application to Addition of two numbers
3. Simulate mobile application to create login form
4. Simulate mobile application to send image from one to another
5. Simulate mobile application to chatting
6. Simulate mobile application to create any games
7. Simulate mobile application to display device information

Note: - Questions for the internal examination will be based on the concepts learnt

ELECTIVE III (b) - COMPILER DESIGN

(For those who joined since 2018-19)

Semester : VI **Hours/week: 4**
Subject Code : FBCSE61B/GBCSE6B **Credits: 5**

Course Outcomes:

CO 1: Know about compiler and translators
CO 2: Understand the Lexical Analysis and basic parsing techniques

CO 3: Knowledge on automatic construction of efficient parsers
CO 4: Learn syntax directed translation and symbol tables
CO 5: Familiarity with error detection, recovery, code optimization and generation technique
CO 6: Implement compiler phases programs

UNIT I **[12 Hours]**

Introduction to compilers: Compilers and translators - Purpose to need translators - The structure of a compiler - Lexical analysis - Syntax analysis - Intermediate code generation - Optimization - Code generation - Bookkeeping - Error handling - Compiler

UNIT II **[12 Hours]**

Lexical analysis: The role of the Lexical analyzer - A simple approach to the design of lexical analyzers - Regular expression-Finite Automata
Basic Parsing techniques: Parsers - Shift- reduce parsing - Operator-precedence parsing - Top-down parsing - Predictive parsers.

UNIT III **[12 Hours]**

Automatic construction of efficient parsers: LR parsers - The canonical collection of LR(0) items - Constructing SLR parsing tables - Constructing canonical LR parsing tables - Constructing LALR parsing tables - Using ambiguous grammars - An automatic parser generator - Implementation of LR parsing tables.

UNIT IV **[12 Hours]**

Syntax-Directed Translation: Syntax-directed translation schemes - Implementation of syntax-directed translators - Intermediate code - Postfix notation - Parse trees and syntax trees -Three-address code, quadruples and triples - Postfix translations.
Symbol tables: The contents of symbol table - Data structures for symbol tables - Representing scope information.

UNIT V **[12 Hours]**

Error detection and recovery: Errors - Lexical-phase errors - Syntactic-phase errors - Semantic errors.
Introduction to code optimization: The principal sources of optimization - Loop optimization - The DAG Representation of basic blocks.
Code generation: Object programs - Problems in code generation - A simple code generator - Peephole optimization.

Text Book

1. Alfred V. Aho , Jeffrey D. Ullman, **Principles of Compiler Design**, Narosa Publishing House, New Delhi, Twenty fifth reprint, 2002

References

2. Dr. Kakde O G, **Comprehensive Compiler Design**, Laxmi Publications Pvt. Ltd., New Delhi, Third Edition, 2005
3. Dick Grune, Henri E Bal, Ceriel J H Jacobs, Koen G Langendoen, **Modern Compiler Design**, Wiley India Pvt., Ltd., New Delhi, Second Edition, 2012

COMPILER DESIGN (Lab)

Hours/week: 1

1. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value. Simulate the same in C language.
2. Write a C program to identify whether a given line is a comment or not
3. Write a C program to recognize strings under 'a', 'a*b+', 'abb'.
4. Write a C program to test whether a given identifier is valid or not.
5. Write a C program to implement operator precedence parsing.
6. Write a C program to implement Program semantic rules to calculate the expression that takes an expression with digits, + and * and computes the value.

7. Write a C program to generate machine code from abstract syntax tree generated by the parser.

Note: - Questions for the Internal/Examination will be based on the concepts learnt

SKILL BASED ELECTIVE – OPEN TECHNOLOGY LAB

(For those who joined since 2018-19)

Semester : VI **Hours/week: 2**
Subject Code : GBITE65P/GBCSE65P **Credits: 2**

Course Outcomes:

CO 1: Acquire the skills for developing python script
CO 2: Knowledge to create simple application window
CO 3: Ability to create web site
CO 4: Know to create simple blogs

Display Text

1. Write a python program to display any given text message

Formula Substitution

2. Write a python program to display Fibonacci serious

Array

3. Write a python program to count the number of vowel in the string

Function

4. Write a python program to convert a date read from the user, given in DD/MM/YYYY format into written format. For example, Enter a date in DD/MM/YYYY Format: 16/7/2003 Output: 16 July, 2003
5. Write a python program to print the contents of a file in uppercase using function
6. Write a python program to sort the contents of a file using function

Operator Overloading

7. Write a python program to implement Operator Overloading

Script

8. Write a python script that implements the Arithmetic Quiz
9. Write a python script to create a button with the text, "Hello World"
10. Write a python script that creates a combo box with three elements. When the selection is changed the selected item is to be printed
11. Write a python script that creates a simple application window with menus and submenus
12. Write a python script that creates a simple application window with displaying lines
13. Write a python program to create your own web site for displaying message
14. Write a python program to create a simple blog using models

Note: - Questions for the Internal/External examination will be based on the concepts learnt

B.COM WITH COMPUTER APPLICATIONS

(Three Years regular programme)
(For those who joined since 2018-19)

Program Specific Outcomes (PSO)

PSO 1: To provide basic knowledge of computers with application to various fields of information technology and its role in Business today.

PSO 2: To provide a platform for the students on the basis of which they can further explore the field of computer application in their related discipline and build the necessary skill set and analytical abilities for developing computer based solutions to real corporate and business problems.

Programme Structure

Sem	Part	Code	Course	Subject Title	Hours /Week	Credits	CIA	ESE	Total Marks
I	I	GBLT11/ GBLA11/ GBLIA11/ GBLH11	Language I	Tamil I/ Basic Arabic I / Intermediate Arabic I/ Hindi I	6	6	40	60	100
	II	GBLF12/ GBLG12	Language II	Functional English I / General English I	6	6	40	60	100
	III	GBCCC11	Core I	**Principles of Information Technology**	5	4	40	60	100
	III	GBCCC12	Core II	Principles of Accountancy – I	5	4	40	60	100
	III	GBCCA13	First Allied I	**Programming in C**	4	3	40	60	100
	III	GBCCA14P	First Allied II	**Programming in C Lab**	2	2	40	60	100
	IV	GBCCE15P	Skill Based Elective	**PC Package Lab**	2	2	-	50	50
				TOTAL	**30**	**27**	**240**	**410**	**650**
II	I	GBLT21/ GBLA21/ GBLIA21/ GBLH21	Language I	Tamil II/ Basic Arabic II / Intermediate Arabic II / Hindi II	6	6	40	60	100
	II	GBLF22/ GBLG22	Language II	Functional English II / General English II	6	6	40	60	100
	III	GBCCC21	Core III	Principles of Accountancy – II	4	3	40	60	100
	III	GBCCC22	Core IV	Business Statistics	4	3	40	60	100
	III	GBCCA23	First Allied III	**Database Query Language**	4	3	40	60	100
	III	GBCCA24P	First Allied IV	**RDBMS LAB**	2	2	40	60	100
	IV	GBCCE25P	Skill Based Elective	**DESIGNING LAB I (PHOTOSHOP)**	2	2	-	50	50
	IV	GBES2	General Interest Course	Environmental Studies	2	2	-	50	50
		GBCCX2	Extra Credit	Business Communication	-	2	-	100	100
				TOTAL	**30**	**27+2**	**240**	**460 +100**	**700+ 100**
III	III	GBCCC31	Core V	**E-Commerce**	6	4	40	60	100
	III	GBCCC32	Core VI	Partnership Accounting	6	4	40	60	100

	III	GBCCA33	Second Allied I	**Visual Programming**	6	5	T– 20 L - 20	60	100
	IV	GBCCE34	Skill Based Elective	Executive Development	3	2	-	50	50
		GBNM3CO	Non Major Elective		4	2	-	50	50
		GBXTN3	Extension/ NSS/ CSS	Extension Activities	2	2	100	-	100
		GBHR3	General Interest Course	Human Rights	3	2	-	50	50
		GBCCX3/ GBCCX3O	Extra Credit	Principles and Practices of Insurance / * Online Certification	-	2	-	100	100
				TOTAL	**30**	**21+2**	**220**	**330+ 100**	**550+ 100**
IV	III	GBCCC41	Core VII	Financial Markets and Services	5	4	40	60	100
	III	GBCCC42	Core VIII	Banking Law and Practice	5	4	40	60	100
	III	GBCCC43	Core IX	Business Mathematics	5	4	40	60	100
	III	GBCCA44	Second Allied II	**Graphics and Animation**	4	3	40	60	100
	III	GBCCA45P	Second Allied III	**Graphics and Animation Lab (Flash)**	2	2	40	60	100
	IV	GBCCE46	Skill Based Elective	Business Research Methods	3	2	-	50	50
	IV	GBVE4	General Interest Course	Values and Ethics	2	2	-	50	50
		GBNM4CO	Non Major Elective		4	2	-	50	50
		GBCCX4/ GBCCX4O	Extra Credit	Business Environment / *Online Certification	-	2	-	100	100
				TOTAL	**30**	**23+2**	**200**	**450+ 100**	**650+ 100**
V	III	GBCCC51P	Core X	Accounting Package Lab(Tally)	4	4	40	60	100
	III	GBCCC52	Core XI	**Web Designing**	4	3	40	60	100
	III	GBCCC53	Core XII	Corporate Accounting	5	3	40	60	100
	III	GBCCE5A/ GBCCE5B	Core Elective I	Income Tax law and Practice – I / Company law	5	5	40	60	100
	III	GBCCE5C GBCCE5D	Core Elective II	Accounting for Management Financial Management	5	5	40	60	100
	IV	GBCCE54P	Skill Based Elective	**Web Designing Lab**	3	2	-	50	50
		GBWS5	General Interest Course	Women Studies	3	2	-	50	50
				Library/Browsing	1	-	-	-	-

		GBCCX5PW / GBCCX5O	Extra Credit	Project: Developing CAI Package/ *Online Certification	-	2	-	100	100
				TOTAL	**30**	**24+2**	**200**	**400+ 100**	**600+ 100**
VI	III	GBCCC61	Core XIII	Practical Auditing	5	4	40	60	100
	III	GBCCC62	Core XIV	Accounting for Specific Entities	5	4	40	60	100
	III	GBCCC63	Core XV	Human Resource Management	4	4	40	60	100
	III	GBCCC64PW	Core XVI	Project	6	4	40	60	100
	III	GBCCE6A	Elective III	Income Tax Law and practice – II	5	5	40	60	100
		GBCCE6B		Services Marketing					
	IV	GBCCE65P	Skill based Elective	**Designing Lab - II (Corel Draw)**	3	2	-	50	50
				Library	2	-	-	-	
		GBSED6	Extra Credit	Skills for Employability Development	-	2	100	-	100
				TOTAL	**30**	**23+2**	**200+ 100**	**350**	**550+ 100**
				GRAND TOTAL	**180**	**145+10**	**1300+ 100**	**2400 +400**	**3700+ 500**

* For Online certification credit alone will be assigned on submission of certificate obtained through appearing for online examination from EDX, Spoken Tutorial, NPTEL or Coursera etc., approved by the department.

CORE I - PRINCIPLES OF INFORMATION TECHNOLOGY

(For those who joined since 2018)

Semester : I **Hours/ week: 5**
Subject Code: GBCCC11 **Credits : 4**

Course Outcomes:

CO 1: Know the generation of computers and various I/O devices
CO 2: Understand about new developments in the digital communication and Networks
CO 3: Obtain knowledge in distributed system and World Wide Web
CO 4: Know the usage of different storages and applications of computers

UNIT I **[15 Hours]**

Computer System : Introduction-The First electronic Computers-Low-Level Languages-High-Level Languages- High-Level Languages- The first commercial Computers-Inside a Typical Computer System-The peripheral devices-Speeding up the System-The Emergence of CISC-What is RISC- The Advantages of RISC-Hazards of RISC- **Input Devices:** Introduction-Keyboard-Mouse-Trackball-Digitizing Tablet-Scanners-Digital Camera- Bar Code Reader-Speech Input Devices- -Light Pen-**Output Devices:** Monitor-Classification Of Monitors-Characteristics of a Monitor- Video Standards- VGA-SVGA-XGA-Printer-Plotter-Sound Cards & Speakers-3D-Audio

UNIT II **[15 Hours]**

General Software Features and Trends: Introduction – Ease of Use-Requirements Of more Powerful Hardware-Mail Enabling - **Introduction to Telecommunications:** Introduction- Analog & Digital signals-Modulation- Types of Modulation- Pulse Modulation Techniques- Digital Modulation – Modems-

Computer Networks: Introduction – Overview of Network- Communication Processors- Communication Media- Types of Networks –Network Topologies- Network Protocols- Network Architecture

UNIT III **[15 Hours]**

Communication Systems: Introduction- Radio- Television – Microwave Systems- Communication Satellites- Radar- Fibre Optics-ISDN- **Distributed Systems:** Introduction-Distributing the processing and storage Functions- Advantages & Disadvantages of Distributed Systems- **Internet and Worldwide Web:** Introduction-What Special about Internet-Internet Access- Internet Basics-Internet Protocols- Internet Addressing- The WWW- Web Pages .**Electronic Mail:** Introduction- Mailing Basics- E-Mail Ethics-Spamming- E-Mail Advantages & Disadvantages- Newsgroups-**Intranets:** Introduction-Characteristics of Intranet-Advantages of Intranets- Business Benefits of Intranets- Drawbacks of Intranets- -Intranet vs. Groupware- Extranet

UNIT IV **[15 Hours]**

Introduction To Multimedia: Introduction – Multimedia in Entertainment- Multimedia in Software Training- Multimedia in Education and Training- Multimedia on the Web- Multimedia in Office Work-– Paint & Draw Applications. **Virtual Reality-** Introduction – Basic History of Virtual Reality – What Does Future Hold for Virtual Reality-**Electronic Commerce:** Introduction – Business-to-Business E-Commerce-The virtual Shop-The digital Middleman- What kind of E-commerce to use-**Hypermedia:** Introduction – Characteristics of Hypermedia- The Components of Hypermedia- Hypermedia Applications-**Data Warehouses and Data Marts:** Introduction-Advantageous of Data Warehouse-Data Warehouse Components- Structure of a Data Warehouse- Uses of a Data Warehouse- Interface with other Data Warehouses

UNIT V **[15 Hours]**

On-Line Analytical Processing (OLAP): Introduction- OLAP and Data Warehousing-Uses of OLAP-OLAP Benefits-**Geographic Information System (GIS):** Introduction- Components of GIS- How GIS Works?- GIS and Related Technologies- What can GIS do for you – GIS is Everyday Life-**Computers in Business and Industry:** Introduction – Office Automation- People- Ergonomics- Office Automation Technologies- Office Automation Systems-**Computers in Home:** Introduction – Household Business-Business Applications at Home – Smart Cards – Communication, Education and Information- Home Entertainment Refined- Creativity and Leisure-**Computers in Education and Training:** Introduction – Literacy- Computer in Schools- Programming Tools- Productivity Tools- Authoring Tools for Students - Computer in Entertainment, Science, Medicine and Engineering

Text Book

1. Alex Leon, Mathews Leon, **Fundamentals of Information Technology**, Tata McGraw Hill Education, New Delhi, Fourth Edition, 2007

References

2. Raja Raman, **Computer Fundamentals**, Prentice Hall India Pvt Limited, New Delhi, 2003

3. Bethesda MD, **Planning for Integrated Academic Information Management Systems**, Proceedings of a symposium sponsored by the National Library of Medicine, 1984, The Library, 1985

4. Lorenzi NM, Riley RT, **Organizational Aspects of Health Informatics**, Springer-Verlag: Managing Technological Change, New York, 1995

FIRST ALLIED I - PROGRAMMING IN C

(For those who joined since 2018)

Semester : I **Hours/week: 4**

Sub.Code : GBCCA13 **Credits : 3**

Course Outcomes:

CO 1: Understand the basic concepts of C programs and different types of data types

CO 2: Gain knowledge about control statements

CO 3: Familiarize with arrays, functions, structures and unions

CO 4: Understand the memory access, manipulation using pointers and working with files

UNIT I **(12 Hours)**

Introduction: History of C –Importance of C – Basic structure of C programs - Constants, Variables and Data types – Operators and Expressions

UNIT II **(12 Hours)**

Input and Output Operations - Decision making and Branching – Decision Making and Looping.

UNIT III **(12 Hours)**

Arrays : one and two dimensional arrays - Initializing one and two dimensional arrays – Multidimensional arrays.

Character Arrays and Strings: Declaring and initializing string variables- Reading strings from terminal- Writing strings to screen – Arithmetic operations on characters - Putting strings together – Comparison of Two Strings -String handling functions – Other string functions.

UNIT IV **(12 Hours)**

User defined functions : Introduction – Need for user defined functions – A multi-function program – Elements of user defined functions – Definition of functions - Return values and their types- Calling a function – Function declarations - Categories of functions – Functions that return multiple values – Nesting of functions - Recursion -The scope and lifetime of variables .

UNIT V **(12 Hours)**

Structures and Unions : Introduction – Defining and declaring structure – Accessing structure members – Structure initialization – Copying and comparing structure variables – Operations on individual members - Arrays of structures – Unions.

Pointers : Introduction - Understanding pointers - Accessing the address of a variable -Declaring and initializing pointers. **File Handling :** Defining and opening a file – Closing a file

Text Book:

1. E Balagurusamy, **Programming in ANSI C**, Tata McGraw - Hill Publishing Company Ltd, New Delhi, Fifth Edition, 2011

Reference Books:

1. K R Venugopal & Sudeep R Prasad Tata, **Programming with C**, McGrawHill Publishing Company Ltd, NewDelhi, 1997
2. Noel Kalicharan, **C by example**, Cambridge University Press,1996
3. S.Thamarai Selvi and R.Murugan, C for All, Anuradha Publishers, 2008

FIRST ALLIED II - PROGRAMMING IN C LAB

(For those who joined since 2018)

Semester : I **Hours/week: 2**

Sub.Code : FBCCA14P/GBCCA14P **Credits : 2**

Course Outcomes:

CO 1: Develop iteration/ decision making codes

CO 2: Work with character, strings and arrays

CO 3: Develop program with minimal lines using functions

CO 4: Develop pointer based programs and to handle possible errors during program execution

Formula Substitution

1. To find largest number among three numbers
2. To find sum of the digits of a given Integer.
3. To generate the Fibonacci series
4. To check whether a given number is Armstrong or not
5. To check whether a given number is perfect or not
6. To check whether the given number is palindrome or not

Arrays

7. To check whether the element is present in the given list or not
8. To sort names in Alphabetical order
9. To count the vowels in the given string

10. To count the number of positive, negative and zero in the list.

Conversion

11. To convert the case of given string from upper case to lower case and vice versa
12. To convert Binary to decimal and vice versa

Function

13. To find the factorial of a given number using recursive and non-recursive function

Structure

14. Preparation of student mark list using structure

Pointers

15. To find average of 10 numbers using pointers

Note: Questions for the external examination will be based on the concepts learnt.

FIRST ALLIED III – DATABASE QUERY LANGUAGE

(For those who joined since 2018)

Semester : II **Hours/week : 4**
Sub.Code : GBCCA23 **Credits : 3**

Course Outcomes:

CO 1: Understand and evaluate the role of database management systems and entity relationship model
CO 2: Understand the SQL data definition and SQL query language
CO 3: Write queries to extract information from large datasets
CO 4: Understand the exception handling concepts

UNIT I **(12 Hours)**

Introduction to Database Systems: Terminology – overview of database design – Entity – Relationship model – database normalization – linking tables within the database – sample database description – Structured Query Language. Table creation and management : table design – table creation – table creation through subqueries – modifying existing tables – altering a table - renaming a table – truncating a table – deleting a table. Data Manipulation : Inserting new rows – modifying existing rows – substitution variables – transaction control statements – deleting rows – table locks.

UNIT II **(12 Hours)**

Basic SQL SELECT statements : syntax – operations within the SELECT statement. Restricting Rows and Sorting Data : WHERE clause – comparison operators – logical operators – treatment of NULL values – ORDER BY clause. Joining Multiple Tables : Cartesian joins – equality joins – non-equality joins – self –joins – Outer Joins – Set operators – Joining multiple tables

UNIT III **(12 Hours)**

Single – Row functions: case conversion functions – character manipulation functions – number functions date functions – other functions – nesting functions – DUAL table. Group functions: group function concepts – HAVING clause – nesting functions – statistical group functions.

UNIT IV **(12 Hours)**

Sub queries: sub queries and their uses – single-row sub queries – multiple- row sub queries - multiple-column sub queries - NULL values – nested sub queries. Constraints : creating constraints – PRIMARY KEY , FOREIGN KEY, UNIQUE KEY and NOT NULL constraints – including constraints during table creation – viewing constraints – disabling constraints - dropping constraints.

UNIT V **(12 Hours)**

User creation and management: Need for security-Creating a user-Granting privileges-Granting roles-Revoking and dropping privileges and roles.

Text Book:

1. Lannes L. Morris – Murphy, **Oracle 9i SQL with an Introduction to PL/SQL**, Thomson Course Technology, 2003

Reference Books:

1. Abraham Silberschatz, Henry F. Korth & S.Sudarshan, **Database System Concepts**, McGraw Hill International Edition , 5th Edition, 2006
2. Rajshekhar Sunderraman, **Oracle 9i Programming A primer**, Pearson Education, 2004

Web Site

- www.vanderbilt.edu/.../How-**Big-Data**-Will-Change-Your-Life-OLLI...

FIRST ALLIED IV – RDBMS LAB

(For those who joined since 2018)

Semester : II **Hours/week: 2**
Sub.Code : FBCCA24P/GBCCA24P **Credits : 2**

Course Outcomes:

CO 1: Write SQL commands to create tables and indexes, insert/ update/ delete data and query data in a relational DBMS.
CO 2: Write queries to retrieve selective records using where clause.
CO 3: Write queries to join tables using foreign key.
CO 4: Write manipulation queries such as String function, Number function, Aggregate function, Date function.

DML

1. Create an address table with fields name , door no , street & city
- describe its structure
- alter the table to include pincode
- alter the table to modify street column
- drop the table

DDL

2. Create a student table with regno, name, age and dept.
- insert records
- delete the students with age above 20
- truncate and drop the table

Functions

3. Create an employee table with fields eno , ename , sex ,age & years of experience
- find out the no. of female employees
- find out the employees with age ranging between 30 and 35
- list out the employees who are working more than 5 years

4. Create a library file with fields accno, title, author, cost & no of copies
- Arrange the books according to accno
- Find out the total no. of books available in the library
- Find out the book of minimum cost

5. Create a player table with fields name, sports(cricket, hockey, etc.),age & country
- find out the eldest and youngest player
- group players according to sports
- list out the Indian players

6. Write the SQL queries to illustrate all number functions
7. Write the SQL queries to illustrate date functions
8. Write the SQL queries to illustrate all string functions
9. Create an item table with field's itemno, itemname, quantity & price and insert records. Illustrate the comparison operators (between, like, in & isnull)
10. Create a table with the fields client no, client name & phone no Illustrate the set operators union , union all, minus & intersect
11. Create a student table with fields' regno, name, English, Tamil, Maths and Total & insert records

- Arrange all records according to Total

- Find the student who got first mark in Maths
- List out the students whose name starts with 'S'

12. Create an inventory table with fields' item no, item name, qnty, price and reorder level insert records
- update the qnty when it goes less than reorder level
- list the items with price less than 100

13. Create a vendormaster table with fields vencode,venname,place and phoneno
Create a ordermaster table with fields itemno,itemcode,vencode,qnty and orderdate .
Illustrate the following constraints using the above tables
- vencode as primary key in vendormaster
- vencode as foreign key in ordermaster
- phoneno as unique
- place as notnull &
- qnty > 100

Note: Questions for the external examination will be based on the concepts learnt.

CORE V - E-COMMERCE

(For those who joined since 2018)

Semester : III **Hours/week : 6**
Sub.Code : FBCCC31/GBCCC31 **Credits : 4**

Course Outcomes:

CO 1: Understand different types of e-commerce
CO 2: Gain knowledge about internet and its components
CO 3: Gain knowledge about the various payment methods
CO 4: Understand the features of e-retailing and various e-services

UNIT I **(18 Hours)**

Introduction : Electronic commerce and physical commerce - Digital Phenomenon - Looking at e-commerce from different perspectives - Different Types of e-commerce - Example of the types of e-commerce - Some e-commerce scenarios - Changes bought by e-commerce - Advantages of e-commerce - Myths about e-commerce development and implementation - System model

UNIT II **(18 Hours)**

Internet and World Wide Web : An Overview of the internet - Brief history of the web - Web system architecture - Uniform Resource Locator - Overview of the hypertext transfer protocol – HTTP - Generation of dynamic web pages – Cookies - HTTP/1.1Client server programming : Important factors in the client – side or web programming - Web design and production – Overview of HTML - Basic structure of an HTML document - Basic text formatting – Links - Images – Image Map – Tables – Frames -Form – Cascading Style sheet- JavaScript

UNIT III **(18 Hours)**

Server side programming I : server fundamentals - The three-tier model - Common Gateway interface - Active server page - Overview of java servlets - java servlet architecture - Overview of the servlets API - Building the virtual book store - Your first servlet - Compilation and execution of servlets - An interactive servlet program example Applications - Internet payment systems: Characteristics of payment systems - 4C payment methods - SET Protocol for credit card payment - E-cash – E-check –Micro payment system - Overview of smart card – Overview of Mondex

UNIT IV **(18 Hours)**

Consumer Oriented e-commerce: Introduction – traditional retailing and e-retailing – Benefits of e-retailing – Key success factors - Models of e-retailing – Features of e-retailing – Developing a consumer – oriented e-commerce system – The PASS Model Business – oriented e-commerce: Features of B2B e-commerce – Business models – Integration

UNIT V **(18 Hours)**

E-services: Categories of e-services – web-enabled services – March making services – information-selling on the web – E-entertainment – Auctions and other specialized services Web advertising and web publishing: traditional versus internet advertising – Internet advertising techniques and strategies – Business models for advertising and their revenue streams – Pricing models and measurement of the effectiveness of advertisements- Web publishing – Web site development methodologies – Logical Design of user interface- Usability testing and quality assurance – Web Presence and visibility

Text Book:

1. Herry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, **E-Commerce Fundamentals and Applications** , John Wiley & Sons Ltd, 2001.

Reference Books:

2. Kamalesh K Bala, Debjani Nag, **E-Commerce the cutting edge of business**, Tata McGraw Hill Publications, New Delhi,2000.
3. Kalakota & Whinston , **Frontiers of Electronic Commerce**, Pearson Education Asia, 2006.
4. P.J Joseph,S.J, **E-Commerce: An Indian Perspective**, PHI Learning Pvt. Ltd., Fifth Edition, 2015.

SECOND ALLIED I – VISUAL PROGRAMMING

(For those who joined since 2018)

Semester : III **Hours/week : 6**
Sub.Code :GBCCA33 **Credits : 5**

Course Outcomes:

CO 1: Understand various data types, modules,procedures and control structure arrays
CO 2: Understand event-driven applications
CO 3: Understand the database connectivity
CO 4: Use specialized GUI components
CO 5: Understand to work with ActiveX data objects
CO 6: Apply visual programming in software development by designing projects

UNIT I **(12 Hours)**

Getting started with Visual Basic 6.0: Introduction to Visual Basic-Visual Basic 6.0 Programming Environment-Working with Forms-Developing an Application-Variables, Data Types and Module-Procedures and Control Structures-Arrays in Visual Basic.

UNIT II **(12 Hours)**

Working with Controls: Introduction-Creating and Using Controls-Working with Control Arrays-Menus, Mouse Events and Dialog Boxes: Introduction-Mouse Events-Dialog Boxes.

UNIT III **(12 Hours)**

ODBC and Data Access Objects: Evolution of Computing Architectures-Data Access Options. ODBC Using Data Access Objects and Remote Data Objects: Open Database Connectivity (ODBC)-Remote Data Objects.

UNIT IV

(12 Hours)

Data Environment and Data Report: Introduction-Data Environment Designer-Data Report. Object Linking and Embedding: Introduction-OLE Fundamentals-Using OLE Container Control-Using OLE Automation Objects-OLE Drag and Drop.

UNIT V **(12 Hours)**

Objects and Classes - Introduction to Objects - Working with Objects – Classes and Class Modules - Introducing Web Browser and DHTML.

Text Book:

1. Content Development Group, Chennai, **Visual Basic 6.0 Programming**, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2007.

Reference Books:

2. PK McBride, **Programming in Visual Basic**, BPB Publications, First Indian Edition,1995.
3. Michael V.Ekedahl, **Developing Applications with Microsoft Visual Basic Advanced Topic**, Cambridge, Course Technology 1999.

VISUAL PROGRAMMING LAB

VISUAL BASIC PROGRAMS

Formula Sustitution

1. Write a Visual basic program to find the simple and compound interest
2. Write a Visual Basic program to check whether the given number is perfect or not
3. Write a Visual Basic program to check given number is prime or not
4. Write a Visual Basic program to check given number is Armstrong or not
5. Write a Visual basic program to implement all date & time functions
6. Write a Visual basic program to calculate the age of a person using calendar control

String manipulation

7. Write a Visual basic program to perform all string manipulations

Arrays

8. Write a Visual basic program to arrange the numbers in order
9. Write a Visual basic program to design a calculator using control arrays

Menu Implementation

10. Write a Visual basic program to implement menus

Controls

11. Write a Visual basic program to prepare student mark list using DAO control

Note: Questions for the external examination will be based on concept learnt

SECOND ALLIED II – GRAPHICS AND ANIMATION

(For those who joined since 2018)

Semester : IV **Hours/week: 4**
Sub.Code : GBCCA44 **Credits : 3**

Course Outcomes:

CO 1: Gain knowledge to create and modify graphic objects
CO 2: Learn to work with layers, animation with both shape and motion tweening
CO 3: Learn Buttons and adding sound to flash movie
CO 4: Uunderstand Basics of ActionScript for interaction with animations

UNIT I: **(12 Hours)**

Getting to know Flash: Flash concepts-Using rulers-Modifying the grid –Exploring workspace – Introducing timeline – Using the controller –Introducing toolbars ,toolbox, layers –using Flash panels – working with panels-Using panel option –grouping panels –using Flash launcher bar-using context menus –customizing the workspace

Creating graphic objects : Exploring the drawing tools –selecting stroke and fill attributes –using eye dropper –selecting a line style –creating custom line style, line, ovals, rectangles –using pencil tool, brush tool, pen tool, -Modifying a path created with the pen tool –adding points to a path –deleting points from a path –modifying points along a path-Modifying a curve –using zoom and pan tools –modifying drawing settings –creating text objects –Adjusting character options –Adjusting paragraph options

Modifying graphic objects : Modifying objects with tools –using arrow tool-selecting objects –creating selections –moving objects –smoothing and straightening objects –modifying shapes –rotating objects – scaling objects –using the snap to objects modifier –using lasso tool –using the scale and rotate command - softening fill edges –using info panel ,transform panel, ink bottle tool, dropper tool, eraser tool, mixer panel, swatches panel –creating custom fill

UNIT II: **(12 Hours)**

Importing Non flash Graphics :Importing vector graphics, bitmap images, - converting bitmaps to flash vector objects – using break apart command – using magic wand – using bitmap as fills – editing a bitmap fill

Working with layers : Organizing movies with layers –creating ,naming selecting , deleting, copying layers –modifying layer properties – hiding layers –locking layers-changing the number of layers displayed-working objects across layers –using paste in place command – guide layers –mask layer

UNIT III: **(12 Hours)**

Creating frame by frame animation : Understanding timeline –adjusting frame rate –changing frame view –viewing frame status –working with frames, key frames, onion skins – editing multiple frames

Animating objects with tweening : Creating motion Tween animations –scaling, rotating object –editing tweens transition –editing motion tween animations –inserting key frames –animating motion paths – creating motion guide layer, motion path-animating multiple objects with shape tweening combining motion with shape tweening-combining shape and motion tweening in an animation

Creating complex animations : Creating, deleting, duplicating, naming, selecting, changing the order of scenes –animating mask layer –creating a movie clip –converting animation into movie clip – synchronizing symbols –controlling animation with layers – adding and deleting frames across multiple layers –creating a multiple layer animation

UNIT IV: **(12 Hours)**

Creating Buttons :Creating rollover button, button, complex button with layers ,morphing buttons, animated buttons, invisible buttons- assigning actions to buttons –using on mouse event action.

Creating interactive movies : Using action panel –assigning action -deleting action –Arranging hierarchy of actions –labeling frames –using expert mode –using action panels option menu –using basic action – using go to action – using play and stop action –stopping sounds in a movie –using get URL action

Adding sound to flash movies : Using sound in flash – importing sounds –creating sound track –adding sound to button –synchronizing movie sounds –starting and stopping sounds –creating custom sound effects

UNIT V: **(12 Hours)**

Introduction to action Script :Creating action script in flash –using the load movie action –using unload movie action –using tell target action –using set variable action –creating names and content for variables – changing a variable's value with an expression –using if –using operators –using mathematical operators – using string operators – working with dynamic text and input text –creating your first action script –testing the movie –using the test movie command

Publishing your flash production : Using bandwidth profiler –using frame by frame graph view –using streaming graph view –changing download setting – using the show streaming command –using the movie explorer –optimizing your flash movies –publishing your flash movies –adjusting publishing settings ,format settings ,HTML settings –publishing movies in projector formats –previewing the publication – publishing the movie

Text Book:

1. Doug Sahlin, **Flash 5,** Mc Graw Hill Publications, 2001

Reference Books:

2. Phillip Kerman, **Teach yourself Macromedia Flash 5**, SAMS Publication, 2001
3. Mark Schaeffer, **Adobe Flash How-Tos**, Pearson Education India, 2009
4. Peter Shirley, **Fundamentals of Computer Graphics**, AK Peters Ltd, 2002

SECOND ALLIED III - GRAPHICS AND ANIMATION LAB (FLASH)

(For those who joined since 2018)

Semester : IV **Hours/week: 2**
Sub.Code : GBCCA45P **Credits : 2**

Course Outcomes:

CO 1: Create animated images
CO 2: Learn to utilize several flash tools
CO 3: Learn to create animated logo
CO 4: Gain knowledge to develop animated pictures using tweening

1. Display the Ball bouncing
2. Draw a melting candle with animation
3. Animate a Doll movement
4. Draw a bird to lay egg and to hatch it with animation
5. Animate the working of Solar System
6. Design a running clock with animation
7. Draw the natural scenery along with the movement of bird
8. Design an animated Logo
9. To animate the life cycle of the Butterfly
10. To animate the scene " Tree growing from the seed"
11. To animate the scene " Leaves falling down from the tree"
12. To animate a cartoon picture
13. Draw the multicolored fishes that jumps in and out of water in the tank

Note :-

Questions for the external examination will be based on the concepts learnt

CORE XI – WEB DESIGNING

(For those who joined since 2018)

Semester : V **Hours/week: 4**
Sub.Code : GBCCC52 **Credits : 3**

Course Outcomes:

CO 1: Understand the basic tags in HTML
CO 2: Obtain knowledge to create a webpage including tables, frames, forms etc.
CO 3: Develop skills to include style sheets
CO4: Understand the fundamental concepts of Client Side and Server Side Programming

UNIT I **(12 Hours)**

Introduction to HTML: Basic HTML concepts–Introduction to common HTML: The Structure of HTML documents - Document types - <html>, <head> and <body> elements – HTML elements – Core attributes – Language attributes – Core events – Block level elements – Text level elements – Character entities

UNIT II **(12 Hours)**

Links and Addressing: Linking Basics –What are URls - Linking in HTML - Anchor attributes - Images and anchors – Image Maps – Semantic Linking with the <LINK> element. HTML and Images: HTML image Basics – Images as buttons. Introduction to Layout, Backgrounds, colors and Text: HTML Approach to Web design – Fonts – Colors in HTML – Background images.

UNIT III **(12 Hours)**

Layout with Tables: Introduction to Tables – Table elements – Tables generated from a data source. Frames and Layers: Frames – Layers – Positioned layers – Inflow layers – Interesting uses of layers.

UNIT IV **(12 Hours)**

Style Sheets: Style Sheet Basics – Style Sheet Properties – Positioning with Style Sheets. Forms: The <FORM> element - Form Controls - <BUTTON> element – Labels - <FIELDSET> - Form Presentation – Forms and Events.

UNIT V **(12 Hours)**

Introduction to Server- Side Programming: Client/Server programming on the Web – Server Side Programming – CGI – Active Server Pages (ASP). Introduction to Scripting and HTML: Purpose of Scripting – JavaScript – VBScript – Including Scripts in an HTML Document – Script Events and HTML – Form Validation in JavaScript.

Text Book:

1. Thomas A Powell, **The complete reference HTML** , McGraw-Hill Osborne Media, 2nd edition , February 26, 1999.

Reference Book:

1. Wendy Willard, **HTML: A Beginner's Guide**, McGraw-Hill Education, Fifth edition, April 3, 2013.
2. John Docket, **HTML and CSS: Design and Build Websites,** John Wiley & Sons, 1st edition, November 8, 2011.
3. Marijn Haverbeke, **Eloquent JavaScript: A modern introduction to Programming**, No Starch Press, 2nd edition, December 7, 2014

PROJECT

(For those who joined since 2018)

Semester : VI **Hours/week: 6**
Sub.Code : GBCCC64PW **Credits : 2**

Course Outcomes:

CO 1: Analyze data from client and determine the requirements
CO 2: Develop data flow diagram
CO 3: Implement the project in high level language
CO 4: Perform various types of testing

Project shall be a group project (Team consist of maximum two members).

SKILL BASED ELECTIVES
PC PACKAGE LAB

(For those who joined since 2018)

Semester : I **Hours/week: 2**
Sub.Code : GBCCE15P **Credits : 2**

Course Outcomes:

CO 1: Create a document in MS Word
CO 2: Perform calculations and comparison of data in MS Excel
CO 3: Prepare slides in Power point presentation
CO 4: Store data in MS Access

Word Processing

1. Design the Time Table given to you at the start of the Semester.
2. Design a "Birthday Invitation" card.
3. Create a 5-page document. Use hyperlinks. Insert Bookmarks.
4. Prepare the given advertisement.

Spread Sheet

1. Prepare a bar chart using chart wizard representing rain fall for the last 5 years in MS-EXCEL. Assume the rain fall indices
2. Prepare students mark list and calculate total, average, result, rank and grade.
3. Illustrate the numeric functions
4. Illustrate the character functions

Presentation

1. Do a presentation with a minimum of 5 slides on the topic "MY NATION" using MS-POWER POINT with audio and video effects.
2. Do a presentation with a minimum of 5 slides on "TOURISM" with pictures.
3. Do a presentation with a minimum of 5 slides on the topic "MY COLLEGE" using MS-POWER POINT with hyperlink.
4. Do a presentation with a minimum of 5 slides with various animation effects.

Database Management

1. Create a table on student Marks details and query the table to list students who are getting greater than 90 marks in Mathematics.
2. Create a table on Employee details and query the table using wizard to list employees who are getting salary more than Rs. 10,000.

Note :- Questions for the external examination will be based on the concepts learnt.

DESIGNING LAB - I (PHOTOSHOP)

(For those who joined since 2018)

Semester : II **Hours/week: 2**

Sub.Code : GBCCE25P **Credits : 2**

Course Outcomes:

CO 1: Gain knowledge of Photoshop and develop their skills in editing and altering images through a tools, layers, and the adjustments panel.
CO 2: Create w Images, Resizing, and Adjusting Resolution.
CO 3: Creat ID card, visiting card, greeting card
CO 4: Convert image into pencil sketch

1. Design a Birthday card using Photoshop.
2. Design scenery using special effect brushes.
3. Design a picture using lasso tool.
4. Design a greeting card using lighting effect.
5. Using layers hide and display the parts of the pictures
6. Design a greeting card & Outline a greeting card using assorted brushes.
7. Design an image and change the image size, canvas size and rotate the canvas to 90 degree.
8. Design a picture and change the mode of the picture.
9. Design a greeting card using pattern available in the rubber stamp tool.
10. Design a picture and give the following effects
    i. Wind ii. Water paper iii. Glowing edges iv. Grain v. mosaic tiles.
11. Design your ID card using Photoshop.
12. Create your own water color by mixing a variety of colors using smudge tool
13. Select the similar colored picture parts using a magic wand tool and past it into another file.
14. Design a picture using varieties of brush tool available in the Photoshop.
15. Design a picture & use the following.
    i. Blur ii. Dodge iii. Sponge iv. Burn
16. Convert a image into pencil sketch

Note: Questions For the External Examinations shall be based on the concepts learnt

WEB DESIGNING LAB

(For those who joined since 2018)

Semester : V **Hours/week: 3**
Sub.Code : GBCCE54P **Credits : 2**

Course Outcomes:

CO 1: Learn to create a webpage with basic formatting tags

CO 2: Create a web page by dividing it into frames

CO 3: Develop a web page for advertising purposes

CO 4: Develop webpages including audio and video

HTML Tags

1. Create a HTML page for displaying the personal information by using various tags such as background color, heading tag, font tag.
2. Create a HTML page, which includes images and audio for any application.
3. Create a HTML page for displaying the Tender notice which is given to you.
4. To create a Time Table of your class using HTML.
5. Create a HTML Page to Advertise the Courses offered by our College using various frames.
6. By using HTML create an advertisement for selling a particular product
7. Create a HTML page to advertise the Opportunities for the job in a Company.
8. Create a web page depicting the application form of our College.
9. Create a HTML page for displaying your Curriculum vita
10. Create a web page to advertise a product of the company using images and audio.
11. To create a simple web page for a company this includes the following details: History, LOGO, Departments, Year wise report, Monthly report, Day to Day reports of the sales of the company.

Frames

12. Create simple CAI package for any subjects which includes 10 topics.
13. To create a simple web site for our college which includes the following details. History of the college and courses offered for both UG and PG, Individual department details, Fee particulars for the courses using frame tag.
14. To create dictionary using frames. The words are displayed in one frame and when you click the word, the meaning will be displayed on the other frame.

Note: Questions for the External examination will be based on concept learnt

DESIGNING LAB - II (COREL DRAW)

(For those who joined since 2018)

Semester : VI **Hours/week: 3**
Sub.Code : GBCCE65P **Credits : 2**

Course Outcomes:

CO 1: Design newsletters, invitations
CO 2: Create images using various tracing techniques
CO 3: Create presentations
CO 4: Create transform objects

1. Create a newspaper advertisement using CorelDraw's text formatting tools.
2. Create a Bitmap Image and apply the auto tracing technique to that Image.
3. Create an object and apply transformation technique.
4. Create a Parachute using the given special fills methods such as
a) Filling object using foundation fills
b) Pattern Fill
c) Interactive Fill Tool
5. Create a certificate template & merged with data files.
6. Create any kind of invitation.
7. Create a Mirror object using Mirror command.
8. Design a magazine
9. Create presentation with slides using CorelDraw.

10. Design a certificate

Note: Questions for the external examination will be based on concept learnt

ALLIED PAPERS FOR OTHER UG PROGRAMME

Sem	Subject Code	Course	Subject Title	Hrs/ wk	Credit	CIA Marks	ESE Marks	Total Marks
III	GBMXA33	ALLIED I	Programming in C	6	5	40	60	100
IV	GBMXA44	ALLIED II	Object Oriented Programming in C++	6	5	40	60	100

ALLIED I - PROGRAMMING IN C

(For those who joined since 2018-19)

Semester: III **Hours/week: 4**
Subject Code: GBMXA3 **Credits: 5**

Course Outcomes:

CO1: Understand the Basic Structure of C Programs.

CO2: Acquire Knowledge about Operators and Expressions.

CO3: Learn types of Branching, Looping Statements and experiment in the lab.

CO4: Understand Character Array and String.

CO5: Get an Idea about Structure, Union and experiment in the lab.

CO6: Understand Pointers and File Concepts.

UNIT I **[12 Hours]**

Introduction: History of C –Importance of C – Basic structure of C programs - Constants, Variables and Data types – Operators and Expressions.

UNIT II **[12 Hours]**

Input and Output Operations - Decision making and Branching – Decision Making and Looping.

UNIT III **[12 Hours]**

Arrays: one and two dimensional arrays - initializing one and two dimensional arrays – multidimensional arrays.

Character Arrays and Strings: Declaring and initializing string variables- reading strings from terminal-writing strings to screen – arithmetic operations on characters - Putting strings together – Comparison of Two Strings -string handling functions – other string functions.

UNIT IV **[12 Hours]**

User defined functions : Introduction – need for user defined functions – A multi-function program – elements of user defined functions – definition of functions - return values and their types- calling a function – function declarations - categories of functions – functions that return multiple values – nesting of functions - recursion -the scope and lifetime of variables.

Structures and Unions : Introduction – defining and declaring structure – accessing structure members – structure initialization – copying and comparing structure variables – operations on individual members - arrays of structures – unions.

UNIT V **[12 Hours]**

Pointers: Introduction- understanding pointers - accessing the address of a variable -declaring and initializing pointers, accessing a variable through its pointer.

File Handling : defining and opening a file – closing a file – i/o operations on files- error handling during i/o operations-random access to files – command line arguments.

Text Book

1. E Balagurusamy, **Programming in ANSI C**, Tata McGraw-Hill publishing Company Ltd, New Delhi,Fifth Edition, 2011

References

2. Venugopal K R , Sudeep R Prasad, **Programming with C**, Tata McGraw-Hill Publishing Company Ltd., NewDelhi, 2008
3. Mullish, Hentry Cooper, Herbert, **The Spirit of C - An introduction to modern programming**, Jaico publishing house, Mumbai, Third Edition, 2006
4. S.Thamarai Selvi and R.Murugan, **C for All,** Anuradha Publishers, Kumbakonam,2008

PROGRAMMING IN C LAB

Hours/week: 2

Formula Substitution

1. Write a C program to find quadratic equation
2. Write a C program to find sin series and cos series

Loop structure

3. Write a C program to find the sum of the digit.

Conditional Statements

4. Write a C program to find the largest number among three numbers

Array

5. Write a C program to check whether the element is present in the given list or not
6. Write a C program to count the number of positive, negative and zero in the list
7. Write a C program to perform matrix manipulation

Number Checking

8. Write a C program to find whether a given number is armstrong or not
9. Write a C program to find whether a given number is perfect or not
10. Write a C program to check whether the given number is palindrome or not
11. Write a C program to check whether the given number is prime or not

Number Generation

12. Write a C program to generate the fibonacci series

Number Conversion

13. Write a C program to convert binary to decimal

Built-in function

14. Write a C program to perform the string handling functions
15. Write a C program to count the vowels in the given string

Recursive Function

16. Write a C program to find the factorial of a given number using recursive function

Structure

17. Write a C program to preparation of student mark list using structure

Pointer

18. Write a C program to find average of 10 numbers using pointers

Note:- Questions for the internal examination will be based on concept learnt

ALLIED II-OBJECT ORIENTED PRIGRAMMING IN C++

(For those who joined since 2018-19)

Semester: IV **Hours/week: 4**

Subject Code: GBMXA4 **Credits : 5**

Course Outcomes:

CO1: Learn Basic Concepts of OOPS.

CO2: Acquire Knowledge about Functions in C++ and experiment in the lab .

CO3: Understand Constructor and Destructor .

CO4: Understand Types of Inheritance and experiment in the lab.

CO5: Acquire Knowledge about Polymorphism.

CO6: Understand File Operations.

UNIT I **[12 Hours]**

Object-Oriented Programming Paradigm: Basic Concepts of Object Oriented Programming- Benefits of OOP-Object Oriented languages-Application of OOP-Beginning with C++-Tokens, Expressions and Control Structure.

UNIT II **[12 Hours]**

Functions in C++ : Introduction- The main function- Function prototyping- Call by Reference- Return by Reference- Inline Functions- Default Arguments- Const Arguments- Function Overloading-Function and Virtual Functions- Math Library Functions.

Classes and Objects: Introduction , Specifying a Class, Defining Member Functions, A C++ Program with Class, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions, Array within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Array of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const Member Functions

UNIT III **[12 Hours]**

Constructor and Destructors: Introduction, Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Destructors.

Operator Overloading and Type Conversion: Introduction, Defining Operator Overloading – Overloading Unary, Binary Operators – Rules for Overloading Operators.

UNIT IV **[12 Hours]**

I**nheritance:**Introduction, Defining Derived Class, Single Inheritance, Making Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Class, Abstract Classes, Constructors in Derived Classes. Member Classes **:** Nesting of Classes.

Pointers, Virtual Functions and Polymorphism:Introduction, Pointers to Objects, this Pointer, Pointer to Derived Classes, Virtual Functions, pure Virtual functions

UNIT V **[12 Hours]**

Working with files: Introduction – classes for file stream operations- opening and closing a file – Detecting End of file – more about open - File modes.

Templates: introduction – class Templates – class templates – class templates with multiple parameters-function templates – function templates with multiple parameters

Exception Handling: Introduction- Basics of Exception Handling – Exception Handling Mechanism-throwing Mechanism-catching mechanism

Text Book

1. E.Balagurusamy ,**Object – oriented Programming With C++,** Fourth Edition -,Tata McGraw-Hill Publishing Company Limited, New Delhi,2008

Reference Book

2. Ivor Horton, **Beginning C++ The Complete Language**, Shroff Publishers and Distributors Pvt. Ltd.,Bangalore, 2007.

3. **Programming Techniques Using C & C++,** Hewlett Packard Enterprise.

PROGRAMMING IN C++ LAB

Hours/week: 2

Formula Substitution

1. Write a C++ program to convert fahrenheit to celsius using class

Number Checking

2. Write a C++ program to check whether a given number is odd or even
3. Write a C++ program to check whether a given number is positive or negative or zero
4. Write a C++ program to check whether a given number is palindrome or not using class
5. Write a C++ program to check whether a given number is Armstrong or not using class

Function

6. Write a C++ program to perform arithmetic operations using Inline function
7. Write a C++ program to find largest number among three numbers using nesting of member function

Overloading

8. Write a C++ program to find area of shapes using function overloading(minimum 2 shapes)
9. Write a C++ program to demonstrate unary operator using operator overloading

Array

10. Write a C++ program to sort the list of numbers using class

Constructor

11. Write a C++ program to find sum of digit using constructor
12. Write a C++ program to find reverse of digit using constructor

Inheritance

13. Write a C++ program to perform student mark list using single inheritance

Pointer

14. Write a C++ program to search whether an element is in the list or not using pointer

Exception Handling

15. Write a C++ program to demonstrate user defined exception

Note:- Questions for the internal examination will be based on concept learnt.

Non-Major Elective Papers

Sem	Subject Code	Subject Title	Hours/Week	Credit	CIA	ESE	Total
III	GBNM3ITP	PC Package Lab	4	2	-	50	50
IV	GBNM4ITP	Multimedia Lab	4	2	-	50	50

PC PACKAGE LAB

(For those who joined since 2018-19)

Semester: III **Hours/Week: 4**
Subject Code: GBNM3ITP **Credits : 2**

Course Outcomes:

CO 1: Create, edit and save file
CO 2: Perform simple arithmetic calculation
CO 3: Ability to create and manipulate presentation
CO 4: Usage of databases

WORD

1. Working with Files-Creating and opening documents, Saving documents, Renaming documents, working on multiple documents. Working with Text – Formatting, Moving, copying and pasting text
2. Lists – Bulleted and numbered lists, Nested lists, Formatting lists
3. Table Manipulations
4. Graphics – Adding clip Art, Add an image from a file, Editing a graphic
5. Spelling and Grammar, AutoCorrect
6. Page formatting-Page margins, page size and orientation, Header and footers, page numbers,Mail Merge
7. Macros – Recording a macro, Running a macro
8. Web wizard – Using the Web Wizard, Creating & Saving web pages, Hyperlinks

EXCEL

1. Modifying a Worksheet – Moving through cells, Adding worksheets, rows and columns, Resizing rows and columns, Selecting cells, Moving and copying cells, Freezing panes
2. Macros – recording and running
3. Formatting cells-Formatting toolbar, Dates and times, Auto formatting
4. Formula and Functions
5. Linking worksheets-Relative, absolute and mixed referencing
6. Sorting and Filling –Basic ascending and descending sorted, Complex sorts, Alternating text and numbers with Auto fill, Auto filling functions
7. Graphics – Adding clip art, add an image from a file
8. Charts – Using chart Wizard, Copy a chart to Microsoft Word

POWER POINT

1. Create a Presentation from a template
2. Working with Slides-Insert a new slide, Applying a design template, Changing slide layouts, Reordering slides, Hide slides
3. Adding Content –Resizing a text box, Text box properties, Delete a text box
4. Video and Audio effects
5. Color Schemes & Backgrounds
6. Save as a web page

ACCESS

1. Using Access database wizard, pages and projects
2. Open an existing database , converting to Access 2000
3. Screen Layouts – Database window, Design view, Datasheet view
4. Creating Tables – Create a Table in design view, Primary key, Indexes, Field validation rules
5. Datasheet Records – Adding, Editing, Deleting records, Adding and deleting columns & Resizing rows and columns, Finding data in a table & replacing, Print a datasheet
6. Declaring Table Relationships
7. Sorting and Filtering-Sorting, Filter by selection, by form, saving & removing a filter
8. Queries – Create a query in design view, Query Wizard, Find duplicates query Delete
9. Forms –Create a form using the wizard, Create a form in Design View
10. Reports-Using the wizard, Create in Design View, Printing reports

Note: - Questions for Internal and External examination will be based on concept learnt

MULTIMEDIA LAB

(For those who joined since 2016-17)

Semester: IV **Hours/Week: 4**
Subject Code: GBNM4ITP **Credits : 2**

Course Outcomes:

CO 1: Understand the tools for editing image like change colors, retouching, correcting mistakes and alter images for advertising or publication
CO 2: Know how to design layouts for web pages, Paper Advertisements, Brouchers, CD Covers, Banners Albums, Pop Ups and etc
CO 3: Use different tools of flash player to create an effective animated picture to analyse the role of art in animation and graphics
CO 4: Understand how to combine multiple pictures and use them to animate for a specified duration

PHOTOSHOP

Converting the image

1. Convert the picture into pencil drawing
2. Convert any one of the bird black and white in a given picture
3. Design a picture and change the mode of the picture
4. Design an image and change the image size, canvas size and rotate the canvas to 90 degree

Tools

88700608. Design a picture and use the following tools

i) blur ii) dodge iii) sponge iv) burn v) sharpen

88701040. Design a picture using lasso tool

88701041. Design an advertisement using text tool and lasso tool

88701042. Create your own water color by mixing a variety of colors using smudge tool

Special Effects

88701472. Design scenery using special effect brushes

88701473. Design a picture and give the following effects

i) wind ii) water paper iii) glowing edges iv) grain v) mosaic tiles

88702384. Design a birthday card using lighting effect

Layers

88711168. Using layers hide and display the parts of the picture

Text effect

88711696. Design a visiting card containing at least one graphics and apply the shadow emboss for text information

88711697. Design a banner using clone stamp tool and Text effect

88711698. Design your visiting card using text effect

MACRO MEDIA FLASH

Keyframes

1. Animate the stages of burning candle
2. Animate a Clock
3. Animate a Doll Movement

Motion Tween

4. Draw a bird to lay egg and to hatch it with animation
5. Draw the multicolored fishes that jumps in and out of water in the tank
6. Draw the Natural Scenery along with the movement of bird
7. Display the Ball bouncing
8. Animate the Life Cycle of the Butterfly
9. Animate the scene “Tree growing from the seed”
10. Animate the scene “Leaves falling down from the tree”
11. Animate Kite which is flying in an irregular path
12. Animate a wheel rolling down on an irregular path
13. Display an animated greeting card
14. Illustrate the working of solar System
15. Create a cartoon movie

Note: - Questions for the Internal/External examination will be based on the concepts learnt