Integral University
STUDY & EVALUATION SCHEME
B.Tech Information Technology

Year 3rd, Semester VI

SNo	Course Code	Subject	Periods			Evaluation Scheme				Subject Total
						Sessional Exam			Exam ESE	
			L	T	P	CT	TA	Total		
Theory Subjects										
1.	ICS-601	Visual Programming Techniques	3	1	0	30	20	50	100	150
2.	ICS-602	Computer Networks	3	1	0	30	20	50	100	150
3.	ICS-603	Open Source Software Technologies	3	1	0	30	20	50	100	150
4.	IIT-601	E-Commerce	3	1	0	30	20	50	100	150
5.		Elective-1	3	1	0	30	20	50	100	150
6.	IIT-602	Information System	2	1	0	15	10	25	75	100
Practicals/Training/Project										
7.	ICS-651	Visual Programming Techniques Lab	0	0	3	10	10	20	30	50
8.	ICS-652	Computer Networks Lab	0	0	3	10	10	20	30	50
9.	ICS-653	Open Source Software Technologies Lab	0	0	2	10	10	20	30	50
10.	IIT-651	Computer Graphics & Animation Lab	0	0	3	10	10	20	30	50
11.	GP-501	General Proficiency	0	0	0	0	0	50	0	50
		Total	**17**	**06**	**11**	**205**	**150**	**405**	**695**	**1100**

Integral University
STUDY & EVALUATION SCHEME
B.Tech Information Technology

List of Electives

Elective-1:-

Advance Concepts in Database systems- ICS-051
Bioinformatics- IIT-011
Storage Technology and Management- ICS-012
Compiler Design - ICS-604

VISUAL PROGRAMMING TECHNIQUES
ICS-601

L	T	P
3	1	0

Unit-1
Introduction to .net architecture, .net framework: CLR, CTS, CLS, JIT compiler, MSIL, Garbage collection, data types, class library, Classes: encapsulation attribute, constructor, object creation, invoking methods, indexes and attributes.
[10]

Unit- II
Delegates and events: understanding delegates, simple delegates, multicast delegate, generic delegate, delegate implementation anonymous method, understanding events, system defined events,. Exception handling: system and application level exceptions, try, catch and finally block, handling multiple exceptions, throw exception on request. [8]

Unit-III
System collection. File handling: stream reader and stream writer, reading and writing a file. Windows forms, adding controls, adding an event handler, adding controls at runtime, attaching an event handler at runtime, implementing MDI child and parent. Multithreading: thread life cycle, thread safety, thread synchronization. [8]

Unit-IV
ADO.NET: understanding the connection object, building the connection string, understanding the command object, datareader, data set, data adapter, updating, inserting and modification in data table and database using dataset. Asp.net: creating server pages, understanding page lifecycle, understanding postback, Validation controls. Statemanagement: session state, query string, view state, cookies. [8]

Unit-V
Networking and sockets, web services: SOA architecture, SOAP and web service, SOAP essentials, WSDL documentation, Disco and disco map file, publishing and consuming a web service. windows services, messaging. Inserting updating and deleting using stored procedure. [8]

COMPUTER NETWORKS
ICS- 602

L T P
3 1 0

UNIT 1
Introduction Concepts: Goals and Applications of Networks, Network Structure and Architecture, The OSI Reference Model, Services, Network Topology Design- Delay Analysis, Back Bone Design, Ocal Access Network Design. Physical Layer Transmission Media, Switching Methods ISDN, Terminal Handling.

UNIT 2
Medium Access Sub Layer: Channel Allocations, LAN Protocols- ALOHA Protocols- Overview of IEEE Standards- FDDI, Data Link Layer- Elementary Data Link Protocol, Sliding Window Protocols, Error Handling.

UNIT 3
Network Layer: Point to Point Networks. Routing: Routing Algorithms. Congestion Control: Chock Packet, Load Shading, Leaky Bucket Algorithm, Token Bucket Algorithm.
Internetworking: Overview, TCP/IP Model. Network Layer: IP Protocol, IP Addresses.

UNIT 4
Transport Layer: Duties, Connection Management, TPDU. Session Layer: Session and Transport Interaction, Synchronization Points, Session Protocol Data Unit.
Presentation Unit: Translation, Encryption/ Decryption, Authentication, Data Compression.

UNIT 5
Application Layer: Message Handling System (MHS), File Transfer, Access and Management (FTAM), Electronic Mail, DMS, Virtual Terminal, Directory Services, WWW, Common management Information Protocol (CMIP).

REFERENCES:

Forouzen,"Data Communication and Networking",TMH
A.S.Tanenbaum,"Computer Networks",3rd Edition,Prentice Hall India,1997.
W.Stallings,"Data and Computer Communication",Macmillan Press,1989.

OPEN SOURCE SOFTWARE TECHNOLOGIES
ICS-603

L	T	P
3	1	0

Unit 1: Open Source and Linux

Open Source Definition, The distribution terms of open source software, open source technology importance, Free and Open Source Software (FOSS), LAMP (Linux, Apache, MySQL, PHP, Python, and Perl.). Benefits, Perspectives of Open Source software Linux and Open Source, Linux Usage Basics: Logging into the system, changing users and editing text files. Running Commands and Getting Help, Browsing the File system, Users, Groups and Permissions. [8]

Unit 2: Linux Administration

Installation of Linux interactively, Perform user and group administration, Administer the Linux printing subsystem, Automate tasks with at, cron, Install, update, query and remove software packages with RPM. [8]

Unit 3: Linux Application

Accessing and Running Applications: cc compiler, gcc Compiler, Mozilla Firefox. Multimedia in Linux : Listening to Audio, Playing video, Using Digital Camera, Recording music / video CDs. Publishing: Open office, Working with Graphics, Printing Documents, Displaying documents with Ghostscript and Acrobat, Using Scanners driven by SANE. [8]

Unit 4: Apache and PHP

Introduction to Web server. Installing Apache on Linux: httpd service. PHP: Testing Installation. Basics of PHP scripts, Variables, Data types, Operators and Expressions, Constants, Flow control functions, If statement, Loops, Arrays, Strings, Dates and Times, Forms. [8]

Unit 5: MySQL Server and Application

MySQL : Configuring MySQL Server, working with MySQL Databases, MySQL Tables, SQL Commands – INSERT, SELECT, UPDATE, REPLACE, DELETE. Date and Time functions in MySQL. PHP – MySQL Application Development : Connecting to MySQL with PHP, Inserting data with PHP, Retrieving data with PHP. Developing PHP scripts for dynamic web page like Feedback form, online admission form, online test. [8]

Books:

Open Source Web Development with LAMP: Using Linux, Apache, MySQL, Perl, and PHP James Lee, Brent Ware. Pub: Addison Wesley

Professional LAMP: Linux, Apache, MySQL and PHP5 Web Development, Jason Gerner, Morgan Owens, Elizabeth Naramore, Matt Warden, Wrox Publication

Red Hat Linux Bible Christopher Negus Wiley Publishing ISBN : 0-7645-4333-4

PHP, MySQL and Apache Julie C Meloni Pearson Education ISBN : 81-297-0443-9

The Complete Reference Linux Peterson Tata McGRAW HILL ISBN : 0-07-044489-7

UNIX using Linux Jack Dent, Tony Gaddis, Pub: Course Technology (Thomson Learning), ISBN : 981-240-218-7

E-COMMERCE
IIT-601

L T P
2 1 0

UNIT 1

Introduction: What is E-Commerce, Forces behind E -Commerce, E-Commerce Industry Framework, Brief History of E-Commerce. Inter Organizational E-Commerce, Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework. Network Infrastructure For E-Commerce Network Infrastructure for E-Commerce, Market forces behind I-way, Component of I Way, Access Equipment, Global Information Distribution Network, Broad band Telecommunication.

UNIT 2

Mobile Commerce: Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, W AP Technology, Mobile Information Devices. Virtual Private Network (VPN) , M commerce VS E commerce, M commerce payment methods and issues, M Commerce limitations

UNIT 3

Introduction to Web security, Firewalls & Transaction Security, Client Server Network, Emerging Client Server Security Threats, Electronic Payments: Overview of Electronics payments, Emerging financial Instruments, Home Banking, Online Banking, digital signatures and authentications,

UNIT 4

Net Commerce: EDI, EDI Application in Business, Legal & ethical Issues in E-Commerce, Identification and tracking tools of E Commerce, web based marketing, Some sites of interests, E Commerce in India, Case Study of Online Banking.

REFERENCES:

Greenstein and Feinman "E-Commerce" TMH 2. Ravi Kalakota, Andrew Whinston "Frontiers of Electronic Commerce" Addision Wesley

Denial Amor "The F-Business Revolution"

Addision Wesley Sokol "From EDI to E-Commerce : A Business Initiative" TMH DIWAN, Sharma "E-Commerce" Excel Asset International "Net Commerce" TMH

Bajaj and Nag "E-Commerce : The Cutting Edge Business" TMH.

ADVANCE CONCEPTS IN DATABASE SYSTEM
ICS-051

L T P
3 1 0

UNIT 1

Query Processing, Optimization & Database Tuning: Algorithms for executing Query Operations, Heuristics for Query Optimizations, Estimations for Query Processing Cost, Join Strategies for Parallel Processors, Database Workloads, Tuning Decisions, DBMS Benchmarks, Clustering & Indexing, Multiple Attribute Search Keys, Query Evaluation Plans, Pipelined Evaluations, System Catalogue in RDBMS.

UNIT 2

Extended Relational Model & Object Oriented Database System: New Data Types, User Defined Abstract Data Types, Structured Types, Object Identity, Containment, Class Hierarchy, Logic Based Data Model, Datalog, Nested Relational Model and Expert Database System.

UNIT 3

Distributed Database System: Structure of Distributed Database, Data Fragmentation, Data Model, Query Processing, Semi Join, Parallel & Pipeline Join, Distributed Query Processing in R* System, Concurrency Control in Distributed Database System, Recovery in Distributed Database System, Distributed Deadlock Detection and Resolution, Commit Protocols.

UNIT 4

Database Security: Database Security, Access Control and Grant & Revoke on Views and Integrity Constraints, Discretionary Access Control, Role of DBA, Security in Statistical Databases.

UNIT 5

Enhanced Data Model for Advanced Applications: Database Operating System, Introduction to Temporal Database Concepts, Spatial and Multimedia Databases, Data Mining, Active Database System, Deductive Databases, Database Machines, Web Databases, Advanced Transaction Models, Issues in Real Time Database Design.

REFERENCES

Majumdar & Bhattacharya, "Database Management System", TMH.
Korth, Silberchatz, Sudarshan, "Database Concepts", Addison Wesley.
Elmastri, Navathe, "Fundamentals of Database Systems", Addison Wesley.
Date C.J., "An Introduction to Database System", Addison Wesley.
Ramakrishnan, Hadzilacous, Goodman, "Concurrency Control & Recovery", Addiosn Wesley.
Ceri & Palgatti, "Distributed Databases", McGraw Hill.

BIOINFORMATICS
IIT-011

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3 1 0

UNIT 1

Introduction, Large-Scale Molecular Biology Data Generation, Researchers Gain Access, The Quality of the Data. Private and Future Data Sources. Metadata: Summary and Reference Systems, Finding New Types of Data Online, Likely Growth Areas. Biological Bases for Bioinformatics: The Diversity of Life Forms, The Unifying Theme [10]

UNIT 2

Nucleotide Sequence Data: Genomic Sequencing, Expressed Sequence Tags, Gene Expression, Transcription Factor Binding Sites and Single Nucleotide Polymorphisms. Computational Representations of Molecular Biological Data Storage Techniques: Databases: Flat, Relational and Object Oriented, Controlled Vocabularies. General Data Retrieval Techniques: Indices, Boolean Search, Fuzzy Search and Neighboring. [8]

UNIT 3

Biological Data Types and Their Special Requirements: Sequences, Macromolecular Structures, Chemical Compounds, Genetic Variability, and Connections to Clinical Data. Representations of Patterns and Relationships: Alignments, Regular Expressions, Hierarchies, and Graphical Models: Markov Chains and Bays Notes. [7]

UNIT 4

Protein Structure Prediction: Secondary and Tertiary, Homology Modeling, ORF Prediction, Gene Prediction, Microarray Data Analysis Visualization: Methods for Presenting Large Quantities of Biological Data, Particularly Sequence Viewers, 3D Structure Viewers, Anatomical Visual at Ion and Database-Driven Web Sites. [8]

UNIT 5

Interoperability: The Challenges of Data Exchange of Data and Integration: On Topologies, Interchange Languages and Standardization Efforts. XML, UMLS, CORBA, PERL, PYTHON and OMG/Life Sciences. [7]

REFERENCES:

Developing Bioinformatics Computer Skill-O Reilly, 1st Indian Edition, SPD publication.
An Intro. To Genetic Analysis - Anthony J. F. Griffiths et al., 1st Ed.
Genomics Protocols-Michael Starkey and Ramnath Elaswarapu.
Bioinformatics-Methods and Protocols-Stephen Misner & Stephen Krawetz
Lawrence Hunter-Artificial Intelligence & Molecular Biology, free on web
DNA & Protein Sequence Analysis- A Practical Approach, IRL Press at Ox University Press.
O' 'Reilly; Developing Bioinformatics Computer Skill- 1st Indian Edition, SPD publication

STORAGE TECHNOLOGY AND MANAGEMENT

ICS-012

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UNIT 1

Introduction to Storage Technology

Data proliferation and the varying value of data with time & usage, Sources of data and States of data creation, Data center requirements and evolution to accommodate storage Needs, Overview of basic storage management skills and activities, the five pillars of Technology, Overview of storage infrastructure components, Evolution of storage, Information Lifecycle Management concept, Data categorization within an enterprise, Storage and Regulations.

UNIT 2

Storage Systems Architecture

Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure Components, properties, performance, and specifications, Logical partitioning of disks, RAID & parity algorithms, hot sparing, Physical vs. logical disk organization, protection, and back end management, Array caching properties and algorithms, Front end Connectivity and queuing properties, Front end to host storage provisioning, mapping, and operation, Interaction of file systems with storage, Storage system connectivity Protocols.

UNIT 3

Introduction to Networked Storage

JBOD, DAS, SAN, NAS, & CAS evolution, Direct Attached Storage (DAS)Environments: elements, connectivity, & management, Storage Area Networks (SAN):Elements & connectivity, Fiber Channel principles, standards, & network management Principles, SAN management principles, Network Attached Storage (NAS): elements, Connectivity options, connectivity protocols (NFS, CIFS, ftp), & management principles, IP SAN elements, standards (SCSI, FCIP, FCP), connectivity principles, security, and Management principles, Content Addressable Storage (CAS): elements, connectivity Options, standards, and management principles, Hybrid Storage solutions overview Including technologies like virtualization & appliances.

UNIT 4

introduction to Information Availability

Business Continuity and Disaster Recovery Basics, Local business continuity techniques, Remote business continuity techniques, Disaster Recovery principles & techniques.

UNIT 5

Managing & Monitoring

Management philosophies (holistic vs. system & component), Industry management Standards (SNMP, SMI-S, CIM), Standard framework applications, Key management Metrics (thresholds, availability, capacity, security, performance), Metric analysis Methodologies & trend analysis, Reactive and pro-active management best practices, Provisioning & configuration change planning, Problem reporting, prioritization, and Handling techniques, Management tools overview.

REFERENCES

1. Fiber Array Storage Technology A FAST Introduction by Barry Mellish; Jure Arzensek; Christian Demmer; Noam Rosen Publisher: IBM Redbooks

2. Resilient Storage Networks: Designing Flexible Scalable Data Infrastructure by Greg Schulz, Greg Schulz, Greg Schulz Publisher: Elsevier Science & Technology Books.

COMPILER DESIGN
ICS-604

L T P
3 1 0

UNIT 1
Introduction to Compiler, Phases and Passes, Bootstrapping, Finite State Machines and Regular Expressions and their Applications to Lexical Analysis, Implementation of Lexical Analyzers, Lexical-analyzer Generator, LEX-compiler, Formal Grammars and their Application to Syntax Analysis, BNF Notation, Ambiguity, YACC.
The Syntactic Specification of Programming Languages: Context Free Grammars, Derivation and Parse Trees, Capabilities of CFG. [10]

UNIT 2
Basic Parsing Techniques: Parsers, Shift Reduce Parsing, Operator Precedence Parsing, Top Down Parsing, Predictive Parsers, 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. [10]

UNIT 3
Syntax-Directed Translation: Syntax-Directed Translation Schemes, Implementation of Syntax-Directed Translators, Intermediate Code, Postfix Notation, Parse Trees & Syntax Trees, Three Address Code, Quadruple & Triples, Translation of Assignment Statements, Boolean Expressions, Statements that Alter the Flow of Control, Postfix Translation, Translation with a Top Down Parser. More About Translation: Array References in Arithmetic Expressions, Procedures Call, Declarations, Case Statements. [8]

UNIT 4
Symbol Tables: Data Structure for Symbols Tables, Representing Scope Information.
Run-Time Administration: Implementation of Simple Stack Allocation Scheme, Storage Allocation in Block Structured Language.
Error Detection & Recovery: Lexical Phase Errors, Syntactic Phase Errors Semantic Errors. [8]

UNIT 5
Introduction to Code Optimization: Loop Optimization, the DAG Representation of Basic Blocks, Value Numbers and Algebraic Laws, Global Data-Flow Analysis.
Introduction to Code Generation. [8]

REFERENCES:
Aho, Sethi & Ullman, "Compiler Design", Addision Wesley.

INFORMATION SYSTEM
IIT-602

L T P
3 1 0

UNIT 1
Foundation of Information Systems: Introduction to Information System in Business, Fundamentals of Information Systems, Types of Information Systems, Solving Business Problems with Information Systems, Effectiveness and Efficiency Criteria.

UNIT 2
System Development: System Analysis and Design functions, CASE Tools, Project Feasibility, Information Requirement and Decision Analysis, Preparing System Proposal, Input/Output design, Procedures & Control Design, Testing and Quality Assurance, Implementation, Evaluation and Maintenance, Hardware and Software selection.

UNIT 3
Business Application of Information Systems: Internet and Electronic Commerce, Intranet, Extranet and Enterprise Solutions, Information Systems for Business Operations, Information Systems for Strategic Advantages.

UNIT 4
Managing Information Technology: Enterprise and Global Management, Security & Ethical Challenges, Planning & Implementing Changes.

UNIT 5
Advanced Concepts in Information System: Enterprise Resource Planning, Supply Chain Management, CRM, and Procurement Management.

REFERENCES:
O. Brian, "Introduction to Information System", TMH.
O. Brain, "Management Information System". TMH.
Steven Alter, "Information System: A Management Perspective", Addison Wesley.
Bansal, "Information System Analysis and Design", New Age.
Murdick, "Information System for Modern Management", PHI.

VISUAL PROGRAMMING TECHNIQUES LAB
ICS-651

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Basic of the .Net framework: .Net architecture, managed code, assemblies, clr, execution of assemblies code, il, jit, net framework class library, common type system, common language specification, interoperability with unmanaged code.

Introduction to VB.Net and C#:
VB.Net : Net features, Data Types **C# :** Data Types, Operators, Garbage Collection, Jagged Array, Collection (Array list, Hash table), Indexer(One Dimension) and property, Delegates and events(Multicasting , Multicasting Event), Exception Handling, Window forms.

ADO.Net & Object Oriented Concepts (Using VB.Net Or C#): Basic window control, Architecture of ADO.Net, Comparison with ADO, .Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Data Grid Constructor, Destructor, Abstraction, interface, polymorphism (Over loading and over ridding).

Practical
A program of binary operator Over loading
A program using delegation in which addition and subtraction of two integer value possible
A program-using Interface.
A program to display the caption, height of command button into label.
A window program for list box give the facility for adding, removing and clearing the list with conformation and store the deleted file in another list box.
Creating a window form through which user can enter details of employee: empid, empname, basic salary, sex, date of birth, date of joining, Designation, total income, total deduction and gross salary will be calculated automatically.
Also in above program all details of employee will be appear in Grid and depending upon selection particular actual record will be appear in form.

ASP.Net : Anatomy of ASP.NET Page, Server Controls : label, dropdown list box, validation controls, list box, text box, radio button, check box, State Management : session, caching, Authentication (window,.Net Passport, Forms Based), Authorization, web services, Advance Grid Manipulation.

Practical

Create an ASP.Net web page using different validation controls.

Create an ASP.Net Web page that lists the customer from customers database table in a sortable Data Grid with paging option. The Data Grid should display three columns, one for the customers' ids, one for the customer's names and one for the customer' phone numbers. The user should be able to sort the Data Grid by customer ID.

Create simple web service.

REFERENCES:

1. Applied .Net Framework Prog. In Ms VB.Net – Jeffrey Richter, Francesco Balena (TMH Publication)
2. Complete Reference C# - Herbert schildt (TMH Publication)
3. Microsoft Visual Basic .Net step by step - Michael Halvorsan (PHI Publication)
4. Microsoft ASP.Net with C# .Net step by step - G.Andew Duthie (PHI Publication)

COMPUTER NETWORKS LAB
ICS-652

L T P
0 0 2

SECTION – A (Study of LAN Trainer Kit)

(A) MAC LAYER

Simulate ALOHA protocol for packet transmission between a no. of Nodes connected to a common bus.
Simulate CSMA protocol for packet transmission between a no. of Nodes connected to a common bus.
Simulate CSMA/CD protocol for packet transmission between a no. of Nodes connected to a common bus.
Simulate TOKEN BUS for bus LAN.
Simulate TOKEN BUS for ring LAN.

(B) DATA LINK LAYER

Simulate PACKET TRANMISION from one Node to another Node.
Simulate SLIDING WINDOW protocol to provide reliable data transfer between two nodes over an unreliable Network.
Simulate STOP & WAIT protocol for packet transmission between a no. of nodes.

(C) APPLICATION LAYER

Simulate FILE TRANSFER protocol to check transfer of file and deceiving of file between two nodes.

SECTION – B (Study of Network Simulator)

LAN EXPRIMENTS

Simulation of network based on Pure Aloha protocol using netsim.
Simulation of network based on Slotted Aloha protocol using netsim.
Simulation of network based on Ethernet protocol using netsim.
Simulation of network based on Token Bus protocol using netsim.
Simulation of network based on Token Ring protocol using netsim.

WAN EXPRIMENTS

Simulation of network based on Router using netsim.
Simulation of network based on Frame relay using netsim.
Simulation of network based on X.25 using netsim.
Simulation of network based on TCP (Transfer Control Protocol) using netsim.
Simulation of network based on UDP (User Datagram Protocol) using netsim.

Simulation of network based on ATM (Asynchronous Transfer Mode) using netsim.

'C' PROGRAMS

WAP to implement TOKEN RING protocol.
WAP to implement ALOHA protocol.
WAP to implement CSMA/CD protocol for a single channel.
WAP to implement CSMA/CD protocol for a double channel.
Simulation of bit stuffing and Error Detection Mechanism (VRC, LRC)

OPEN SOURCE SOFTWARE TECHNOLOGIES LAB
ICS-653

COMPUTER GRAPHICS & ANIMATION LAB
IIT-651

L T P
0 0 3

DDA Line Drawing Algorithm

Bresenham's Line Drawing Algorithm

Mid-Point Circle Drawing Algorithm

Rotation of 2D
Line
Triangle
Rectangle

Translation of 2D
Line
Triangle
Rectangle

Scaling of 2D
Line
Triangle
Rectangle

Cohen Sutherland Line Clipping Algorithm

Projection
Parallel
Perspective

(9) Text Animation using Flash

(10) Motion of Ball using Flash

(11) Motion of a Ball along a specified path

(12) Shape animation using Ball

(13) Animation of object using Maya.