



**Department of Information Technology
Central University of Kashmir
Tullamull Campus, Ganderbal.**

Syllabus for B. Tech. CSE 5th Semester

[BoS 27/5/2020]

S. No	Course Code	Course Title	Credits	Evaluation		
				CIA	ESE	Total
1.	BTCS 501	Computer Architecture	4	40	60	100
2.	BTCS 502	Database Management Systems	4	40	60	100
3.	BTCS 503	Software Analysis & Design	4	40	60	100
4.	BTCS 504	Java Programming	4	40	60	100
5.	BTCS 505	DBMS Lab	2	40	60	100
6.	BTCS 506	Java Lab	2	40	60	100
		Total	20			

BTCS 501: Computer Architecture

Unit-I :

Basics of Computer Architecture and Organization, Stored Program Organization (Von Neumann Architecture), Register Transfer Language, Microoperations(Arithmetic, Logic, Shift), Instruction codes, Registers, Instruction set, Hard wired Control Unit, Instruction cycle, Instruction types: Memory reference, Register Reference and I/O instructions. Interrupt cycle, Computer Organization and Design.

Unit-II :

Instruction Formats, Addressing Modes, Stack Organization, Program Control, Characteristics of RISC and CISC, Introduction to Pipelining.

Integer and Floating-Point Representation, Fixed Point Arithmetic: Addition, Subtraction, Multiplication and Division With Flowcharts, Floating Point Arithmetic: Addition and Subtraction.

Unit-III :

Input-Output Organization, Peripheral Devices, I/O interface, Isolated and Memory Mapped I/O Asynchronous Data transfer: Strobe control , Handshaking, serial transfer, Priority Interrupt: Daisy chaining, Parallel Priority interrupt, Direct Memory Access

Unit-IV :

Memory Hierarchy, Main Memory: RAM, ROM, Auxiliary Memory (Magnetic Disk), Associative Memory, Cache Memory: Mapping Functions, Replacement Algorithm, Virtual Memory Concepts, Virtual Memory Address Translation,

References:

1. Moris Mano, Computer system Architecture, PHI.
2. Hamacher, Computer Organization, McGraw Hill.
3. Parthasarthy, Advanced Computer Architecture, Cengage India.
4. Tennenbaum A. S., Structured Computer Organization, PHI.
5. Gear C. W., Computer Organization and Programming, McGraw Hill

BTCS502: Database Management Systems

UNIT – I

Introduction: Database Concepts, Database System Architectures: Centralized and Client-Server Architectures, 2 Tier and 3 Tier Architecture, Data Modelling: Data Models, E-R and EER diagrams: Components of E-R Model, conventions, legacy system model. Relational Model, Codd's Rules, Mapping E-R to Relational Model.

UNIT – II

Query Languages: Relational Algebra: Basic Operations. Relational Calculus: Basic Operations. Introduction to SQL: SQL Data Definition and Data Types, Specifying Constraints in SQL, Basic Retrieval Queries in SQL, INSERT, DELETE, and UPDATE Statements in SQL.

Database Design: Functional Dependency, Purpose of Normalization, Data Redundancy and Update Anomalies, Single Valued Normalization: 1NF, 2NF, 3NF, BCNF. Decomposition: lossless join decomposition and dependency preservation, Multi valued Normalization (4NF), Join Dependencies and the Fifth Normal Form.

UNIT – III

Query Processing: Overview, Measures of query cost, Transaction: Basic concept of a Transaction, Transaction Management, Properties of Transactions, Concept of Schedule, Serial Schedule, Serializability, Cursors, Triggers, assertions, roles and privileges Programmatic SQL.

UNIT – IV

Concurrency Control, Deadlocks, Recovery, File Organisation, Introduction to Parallel Databases. Introduction to No SQL Databases- Internet Databases, Cloud Databases, Mobile Databases. Introduction to Big Data and XML, Introduction to Data Warehousing and Data Mining.

References:

1. Silberschatz A., Korth H., Sudarshan S, Database System Concepts, McGraw Hill Publication, ISBN-0-07-120413-X, Sixth Edition.
2. S. K. Singh, Database Systems: Concepts, Design and Application, Pearson Publication, ISBN-978-81317-6092-5.
3. Thomas H Cormen and Charles E.L Leiserson, Introduction to Algorithm, PHI Publication, ISBN: 81203-2141-3.
4. R. C. T. Lee, S S Tseng, R C Chang, Y T Tsai, Introduction to Design and Analysis of Algorithms, A Strategic approach, Tata McGraw Hill., ISBN-13: 978-1-25-902582-2. ISBN-10: 1-25-902582-9.
5. Anany Levitin, Introduction to the Design & Analysis of Algorithm, Pearson Publication, ISBN 81-7758-835-4.
6. Steven S Skiena, The Algorithm Design Manual, Springer, ISBN 978-81-8489-865-1, Second Edition
7. George T. Heineman, Gary Pollice, Stanley Selkow, Algorithms in a Nutshell, A Desktop Quick Reference, O'Reilly, ISBN: 9789352133611.
8. Gilles Brassard, Paul Bratle, Fundamentals of Algorithms, Pearson Publication, ISBN 978-81-3171244-3.

BTCS 503: System Analysis and Design

Unit I

System Concepts and SDLC: Components and Characteristics of a System; Types of Information Systems; Modern Approach to System Analysis and Development, Role and Need of System Analyst in System Development; System Development Methodology: System Development Life Cycle, SDLC Models, Requirement Analysis, Feasibility Study and types, System Analysis and system Design, Link Program Testing, Conversion And Installation, System Review And Evaluation, Maintenance; Prototyping.

Unit II

System Analysis: System Planning and Initial Investigation, Fact Analysis, Information Gathering Tools; Tools of Structured Analysis: Data flow Diagram(DFD), Data Dictionaries, Decision Trees And Tables; Cost/Benefit Analysis, Types of costs ; System Requirement Specifications, Documentation Techniques for System Analysis; Object Oriented Analysis-UML(Unified Modelling language), Object Oriented Development Life Cycle and Modelling, Modelling using UML (Usecases, Activity Diagram, Class Diagram, Sequence Diagram)

Unit III

System Design: Modular and Structured Design, Module Specifications, Coupling and Cohesion; Forms-Driven Methodology IPO Charts, Structured Walkthrough; Input/Output and Forms Design: Requirements of Forms Design, Types of Forms; Dialog (User Interface) Design; File and Data Base Design: File Structure and File Organization, Data Structure, Normalization and its Types, Role of Data Base Administrator.

Unit IV

System Implementation: System Testing and Quality Assurance, Test Plan, Testing Techniques Available, Quality Assurance Goals in Systems Life cycle, Trends in Testing; Implementation and Software Maintenance; System Control And Audit Trails; System Administration And Training; Hardware/Software Selection-Suppliers, Software Industry, Procedure and Phases in Selection of Software, Evaluation Process; Project Scheduling and Management.

References:

1. Jeffery. Hoffer, “ Modern System Analysis And Design”, Person Edu., New Delhi.
2. Awadh. Elias M. “Systems Analysis and Design”, Prentice Hall of India, New Delhi.
3. Dennis Alan, “System Analysis and Design”, Wiley Publications, John Wiley & Sons, Inc.

4. Coad, Peter and Edward Yourdon. "Object- Oriented Analysis", Englewood cliff, New Jersey, Yourdon Press.
5. Hawryskiewycz, I.T. Introduction to System Analysis and Design. Prentice Hall of India.
6. Macro. T.D Structure Analysis and Systems specifications New Delhi, Yourdon press.

BTCS 504: JAVA Programming

Unit I

Introduction to Java Language: Creation of Java. How Java changed the Internet. Features of Java Language. Evolution of Java. Comparison with other languages like C++.Java Virtual Machine (JVM) and Byte-code.

Java Language Overview: Lexical issues – Whitespace, Identifiers, Keywords, Literals, Separators, and Comments. Installing JDK.PATH variable. Java program – Structure, Compilation and Execution. Java Class libraries (System Class).main() method.

Data types, Variables and Arrays: Primitive Data-types and Typed-Literals. Variables – Declaration, Initialization, Scope and Lifetime. Arrays – Single and Multidimensional. Type Conversion and Expression Promotion.

Operators, Expressions and Control statements: Arithmetic, Bitwise, Relational, Logical, Assignment. Precedence and Associativity. Selection, Iteration and Jump Statements.

Unit II

Class Fundamentals: Class Structure (Variable and Method declaration).Modifiers (Access Modifiers and Other Modifiers).Components of Class, Variable and Method declaration. Constructor and finalize(). Garbage Collection. Passing parameters to methods. Variable hiding. Method overloading. Constructor overloading and chaining. Use of this keyword. Code blocks - Static and non-static.

Inheritance: Mechanism. Role of Access Modifiers. Method Overriding and Shadowing. Use of super keyword. Polymorphism - Early and Late binding. Abstract Class and Interface. Components of Interface declaration. Implementing Interfaces.

Exception Handling: Mechanism - Exception-Object, Throwing an Exception, and Exception Handler. Catch or Specify policy. Types of Exception - Checked vs Unchecked, Built-in vs User-defined. Catching an Exception - try-catch-finally. Specifying an Exception - throws. Manually throwing an Exception - throw. Custom Exceptions. Chained Exceptions.

Unit III

Packages: Creating and Importing Packages. CLASSPATH variable. static import.

Strings: Mutable and Immutable Strings. Creating Strings. Operations on Strings.

Threads: Creating Threads in Java. Java Thread Lifecycle. Multithreading in Java: Synchronization and Inter-process communication (IPC) in Threads.

Applet: Java Applet class Architecture. Working and Lifecycle of Java Applet. Displaying text and animation, and passing parameters to Applet. Embedding Applets in a web page.

Unit IV

Event-Driven Programming: Introducing the AWT: Window Fundamentals, Working with Frame Windows.

Using AWT Controls: Control Fundamentals, Labels, Buttons, Applying Check Boxes, Lists, TextField.

I/O Streams: Byte, Character, Buffered, Data, and Object Streams. Standard Streams. File I/O Basics, Reading and Writing to Files. Serializing Objects.

Networking Classes and Interfaces: TCP/IP Server Sockets in Java, InetAddress, Whois. URL.

References:

1. H. Schildt, Java: The Complete Reference, 9th Edition, Tata McGraw Hill, 2014.
2. K. Sierra, Sun Certified Programmer For Java 5, Wiley India, 2006.
3. K. Sierra and B. Bates, Head First Java (Java 5), 2 nd Edition, O'Reilly, 2003.
4. H.M. Dietel and P.J. Dietel, Java: How to Program, 6th Edition, Pearson Education, 2007.
5. C.S. Horstmann and G. Cornell, Java 2 Vol-1 Fundamentals, 7th Indian Reprint, Pearson Education, 2006.
6. E. Balagurusamy, Programming with Java: A Primer, 4 th Edition, Tata McGraw Hill, 2010.