

Even Semester
Subject: Computer Science
Semester II

Name of the Instructor: Baidyanath Sou

Course Code: BCOSCCHC202

Course Title: Data Structures

Course Type: CC-4

Credit: 4

Number of Classes	Remedial/ Tutorial class	Topics
L1	2 Classes	Introduction to Trees, Binary Trees
L2		Tree Traversals, Binary Search Trees
L3		Binary Search Trees(Continue...)
L4		Height-Balanced Trees, Various Operations on Adelson-Velski and Landis (AVL) Trees
L5		Linear Search, Binary Search, Comparison of Linear Search and Binary Search
L6		Selection Sort, Bubble Sort
L7		Insertion Sort, Shell Sort
L8		Recursion
L9		Tracing Recursion, Analysing Recursion
L10		Analysing Recursion, Towers of Hanoi
L11	2 Classes	Introduction of Hashing
L12		Direct Address Table
L13		Chaining
L14		Linear Probing, Quadratic Probing, Double Hashing

Even Semester
Subject: Computer Science
Semester VI

Name of the Instructor: Baidyanath Sou

Course Code: BCOSDSHT5

Course Type: DSE-4

Course Title: Artificial Intelligence

Credit: 6

Number of Classes	Remedial/ Tutorial class	Topics
L1		Introduction to Artificial Intelligence, Background and Applications
L2		Turing Test and Rational Agent Approaches to AI
L3		Introduction to Intelligent Agents and their Structures, Behaviours and Environments.
L4	2 Classes	Problem Characteristics, Production Systems, Control Strategies
L5		Breadth First Search, Depth First Search
L6		Hill Climbing and its Variations, Heuristics Search
L7		Best First Search, A* Algorithm
L8		A* Algorithm (Continue....)
L9		Constraint Satisfaction Problem, Means-End Analysis
L10		Introduction to Game Playing
L11		Min-Max and Alpha-Beta Pruning
L12		
Class Test		
L13	2 Classes	First Order Predicate Logic
L14		Resolution Principle, Unification, Semantic Nets
L15		Conceptual Dependencies, Frames and Scripts
L16		Production Rules, Conceptual Graphs.
L17		Dealing with Uncertainty and Inconsistency
L18		Dealing with Uncertainty and Inconsistency (Continue....)
L19		Truth Maintenance System, Default Reasoning
L20	3 Classes	Probabilistic Reasoning
L21		Bayesian Probabilistic Inference
L22		Bayesian Probabilistic Inference (Continue....)
L23		Understanding Natural Languages
L24		Parsing Techniques
L25		Parsing Techniques (Continue....)
L26		Context-Free and Transformational Grammars
L27		Context-Free and Transformational Grammars (Continue....)
L28		Context-Free and Transformational Grammars (Continue....)
L29		Recursive and Augmented Transition Nets
L30		Recursive and Augmented Transition Nets (Continue....)
Classes Test		

Name of the Instructor: Baidyanath Sou

Course Code: BCOSCCHC102

Course Type: CC-2

Course Title: Computer System Architecture

Credit: 2

Number of Classes	Remedial/ Tutorial class	Topics
L1		Computer Registers, Bus System, Instruction Set
L2		Timing and Control, Instruction Cycle, Memory Reference, I/O and Interrupts
L3		Interconnection Structures, Bus Interconnection Design of Basic Compute
L4	2 Classes	Register Organization, Arithmetic and Logical Micro-operations, Stack Organization
L5		Micro programmed Control, Instruction Formats, Addressing Modes
L6		instruction Codes, Machine Language, Assembly Language, RISC and CISC Architectures
Class test		
L7		Pipelining and Parallel Architecture
L8		Memory Hierarchy, Cache Memory, Associative Memory
L9		Cache Mapping Techniques
L10		Cache Mapping Techniques (Continue)
L11	2 Classes	External Devices, I/O Modules
L12		Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels
Class test		

Odd Semester

Subject: Computer Science

Semester V

Name of the Instructor: Baidyanath Sou

Course Code: BCOSCCHT502

Course Type: CC-12

Course Title: Computer Networks

Credit: 6

Number of Classes	Remedial/ Tutorial class	Topics
L1		Introduction of Networking, Components of Data Communication, Protocols and Standards, Network Topologies
L2		Layered Network Architecture, OSI Reference Model
L3		TCP/IP Protocol Suite
L4		Analog and Digital Signals, Data Rate Limits

L5		Line Coding Schemes, Pulse Code Modulation
L6		Parallel and Serial Transmission, Multiplexing
L7	3 Classes	FDM, TDM
L8		Transmission Media
L9		Circuit Switching, Packet Switching
L10		Datagram Networks and Virtual-Circuit Networks
L11		Data Link Layer
L12		Error Detection and Correction
L13		Data Link Control, Framing and Flow Control
L14		Stop and Wait ARQ, Go-Back-N ARQ
L15		CSMA, CSMA/CD
L16		Reservation, Polling, Token Passing
L17		IEEE Standard for LANs, 802.3 MAC
L18		Repeaters, Hubs, Switches, Bridges, Routers, Gateways
		Class Test
L19	2Classes	Logical Addressing (Classful and Classless Addressing)
L20		Subnetting, Internet Protocol
L21		Routing Algorithms
L22		Routing Algorithms
L23		UDP, TCP
L24		Flow and Congestion Control
L25		DNS
L26		HTTP
L27		FTP, SMTP and POP
		Class Test

Odd Semester
Subject: Computer Science
Semester I

Name of the Instructor: RANJAN KUMAR MISHRA

Course Code: BCOSCCHC101

Course Type: CC-1

Course Title: Programming Fundamentals using C

Credit: 6

Number of Classes	Remedial/ Tutorial class	Topics
L1	2 Classes	A Brief History of C, Procedural Programming vs. Object-

		Oriented Programming, Form of a C Program, Compilation and Execution of a C Program, C's Memory Map.
L2		Basic Data Types, Declaration and Definition of Variables, Scope of Variables, Storage Class Specifiers, Variable Initialization, Constants,
L3		Type Qualifier (<i>const</i>), Operators, Formatted Console I/O (<i>scanf()</i> , <i>printf()</i>), Unformatted Console I/O (<i>getchar()</i> , <i>putchar()</i>), Header Files, Use of Comments.
L4	3 Classes	Operator Precedence in Expressions, Type Conversion in Expressions, Casts, <i>True and False in C</i> .
L5		Selection Statements, Iteration Statements, Jump Statements, Block Statements.
L6		One-Dimensional Arrays, Array Initialization, Generating a Pointer to an Array, Passing One-Dimensional Arrays to Functions. Two-Dimensional Arrays, Passing.
L7		Two-Dimensional Arrays, Passing Two-Dimensional Arrays to Functions, Character Arrays, Array of Strings,
L8	2 Classes	Indexing Pointers, Introduction to Multi-Dimensional Arrays.
L9		General form of a Function, Function Declaration and Definition, Function Arguments (Call by Value and Call by Reference).
L10	2 Classes	Arguments to <i>main()</i> (<i>argc and argv</i>), Returning from a Function, Functions Returning Values, Function Returning Pointers, Functions of Type <i>void</i> ,
L11	2 Classes	Declaring Variable-Length Parameter Lists, Recursion, Library Functions.
L12	2 Classes	Basics of Structures, Accessing Structure Members, Structure Assignments.,
L13	1 Class	Array of Structures, Pointers to Structures, Passing Structures to Functions, Nested Structures
L14		Self-Referential Structures, Bit-Fields, Unions, <i>typedef</i> .
L15	2 Classes	Pointer Variables, Pointer Assignments, Pointer/Address Arithmetic,
L16		Pointer Comparison, Array of Pointers, Multiple Indirection, Pointers to Functions,
L17	2 Classes	Problems with Pointers.
L18		Static and Dynamic Memory Allocation, C's Dynamic Allocation Functions (<i>malloc()</i> , <i>calloc()</i> , <i>free()</i>).
L19		Opening and Closing a File, Reading and Writing Text

		Files, Random Access in Files,
L20		Preprocessor Directives, Macros.
Class test		

Dept. of Computer Science
J. K. College, Purulia

Lesson Plan(Session-2020-21)
Name of the Instructor: Bubai Das

Semester- 2nd

Subject- Discrete Structures

Number of Classes	Topics	Remedial/ Tutorial class
L1	Asymptotic Notations	2 Classes
L2	Asymptotic Notations	
L3	Summation Formulas and Properties, Bounding Summations	
L4	Bounding Summations	
L5	Recurrence Relations	1 Classes
L6	Generating Functions	
L7	Linear Recurrence Relations with Constant Coefficients and their Solutions	1 classes
L8	Linear Recurrence Relations with Constant Coefficients and their Solutions	
L9	Substitution Method	2 Classes
L10	Recursion Trees	
L11	Master Theorem.	
Class Test		

Semester- 4th

Subject- Database Management Systems

Number of Classes	Topics	Remedial/ Tutorial class
L1	Traditional File-Based Systems, Characteristics of Database Approach	1 Classes
L2	Data Models	
L3	Database System Architecture, Data Independence	
L4	Entity Types	2 Classes
L5	Relationships, Constraints	
L6	Relationships, Constraints	
L7	Relationships, Constraints	
L8	Enhanced Entity-Relationship Model	

L9	Enhanced Entity-Relationship Model	
L10	Relational Model Concepts	3 Classes
L11	Relational Constraints	
L12	Relational Constraints	
L13	Relational Algebra and Relational Calculus	
L14	Relational Algebra and Relational Calculus	
L15	Relational Algebra and Relational Calculus	
L16	Relational Algebra and Relational Calculus	
L17	Data Manipulation Language (DML), Data Definition Language (DDL), SQL Queries, Views	1 Classes
L18	Data Manipulation Language (DML), Data Definition Language (DDL), SQL Queries, Views	
L19	Mapping ER/EER Model to Relational Database	1 Classes
L20	Mapping ER/EER Model to Relational Database	
L21	Purpose of Normalization, Data Redundancy and Update Anomalies	3 Classes
L22	Purpose of Normalization, Data Redundancy and Update Anomalies	
L23	Functional Dependencies	
L24	Functional Dependencies	
L25	Functional Dependencies	
L26	Process of Normalization (Decomposition), Normal Forms	
L27	Process of Normalization (Decomposition), Normal Forms	
L28	Process of Normalization (Decomposition), Normal Forms	
L29	Process of Normalization (Decomposition), Normal Forms	
L30	Correctness Criteria for Normalization (Lossless-Join Decomposition and Dependency Preservation)	
L31	Correctness Criteria for Normalization (Lossless-Join Decomposition and Dependency Preservation)	
Class Test		
L32	ACID Properties	2 Classes
L33	ACID Properties	
L34	Serializability	
L35	Transaction States	
L36	Concurrency Control Protocols (Lock-Based Protocols)	
L37	Concurrency Control Protocols (Lock-Based Protocols)	
L38	Concurrency Control Protocols (Lock-Based Protocols)	
L39	Deadlocks	
L40	Operations on Files, Unordered and Ordered Records	3 Classes
L41	Overview of File Organizations	
L42	Indexing Structures for Files (Primary Index, Secondary Index	
L43	Indexing Structures for Files (Primary Index, Secondary Index	
L44	Clustering Index)	
L45	Multilevel Indexing using B Trees and B+ Trees	
L46	Multilevel Indexing using B Trees and B+ Trees	
Class Test		

Semester- 4th

Subject- [Software Engineering](#)

Number of Classes	Topics	Remedial/ Tutorial class
L1	Introduction	2 Classes
L2	The Evolving Role of Software, Software Characteristics, Changing Nature of Software	
L3	Software Engineering as a Layered Technology	
L4	Software Process Framework, Framework and Umbrella Activities.	
L5	Software Process Framework, Framework and Umbrella Activities.	
L6	Classical and Iterative Waterfall Model	2 Classes
L7	Prototyping Model; Spiral Model and its importance towards application for different system representations	
L8	Prototyping Model; Spiral Model and its importance towards application for different system representations	
L9	Comparative studies	
L10	Software Requirement Analysis, Initiating Requirement Engineering Process	1 Classes
L11	Requirement Analysis and Modeling Techniques	
L12	Flow Oriented Modeling (DFD)	
L13	Need for SRS, Characteristics and Components of SRS	
Class Test		
L14	Estimation in Project Planning Process, COCOMO	1 Classes
L15	Estimation in Project Planning Process, COCOMO	
L16	Project Scheduling	
L17	Quality Concepts, Software Quality Assurance	1 Classes
L18	Software Reviews, Metrics for Process and Projects.	
L19	Design Concepts, Modularity	2 Classes
L20	Coupling and Cohesion	
L21	Strategies of Design, Function-Oriented Design	
L22	Structure Chart Conversion from DFD: Transform Centric and Transaction Centric	
L23	Software Testing Fundamentals, Strategic Approach to Software Testing	2 Classes
L24	Test Strategies for Conventional Software	
L25	Validation Testing, System Testing, Black-Box Testing	
L26	White-Box Testing and their Types, Basis Path Testing	
Class Test		

Semester- 5th

Subject- Theory of Computation

Number of Classes	Topics	Remedial/ Tutorial class
L1	Alphabets, Strings, Languages	1 Class
L2	Operations on Languages (Concatenation, Kleene Closure).	
L3	Deterministic and Non-Deterministic Finite Automata, Transition Graphs	2 Classes
L4	Deterministic and Non-Deterministic Finite Automata, Transition Graphs	
L5	Deterministic and Non-Deterministic Finite Automata, Transition Graphs	
L6	NFA to DFA Conversion	
L7	Regular Languages and their Relationships with Finite Automata	3 Classes
L8	Regular Languages and their Relationships with Finite Automata	
L9	Regular Expressions	
L10	Regular Expressions	
L11	Closure Properties of Regular Languages	
L12	Pumping Lemma	
Class Test		
L13	Context-Free Grammars and Languages	1 Class
L14	Derivations, Parse Trees, Ambiguities in Grammars and Languages	
L15	Language Generated by a CGF	
L16	elimination of useless Symbols/Productions, Unit Productions	1 Class
L17	Chomsky Normal Forms	
L18	Pushdown Automata (Deterministic and Non-Deterministic)	3 Classes
L19	Pushdown Automata (Deterministic and Non-Deterministic)	
L20	Pushdown Automata (Deterministic and Non-Deterministic)	
L21	Pushdown Automata (Deterministic and Non-Deterministic)	
L22	Pumping Lemma for CFG	
L23	Properties of Context-Free Languages	
L24	Turing Machine as a Model of Computation	3 Classes
L25	Turing Machine as a Model of Computation	
L26	Turing Machine as a Model of Computation	
L27	Universal Turing Machine, Language Acceptability, Decidability, Halting Problem	
L28	Recursive and Recursively Enumerable Languages, Undecidable Problems.	
Class Test		

Semester- 6th

Subject- [Operation Research \(O.R.\)](#)

Number of Classes	Topics	Remedial/ Tutorial class
L2	Transportation Problem	2 Classes
L3	Transportation Problem	
L4	Transportation Problem	
L5	Transportation Problem	
L6	Assignment Problem	2 Classes
L7	Assignment Problem	
L8	Assignment Problem	
L9	Assignment Problem	
L10	Assignment Problem	
L11	Game Theory	2 Classes
L12	Game Theory	
L13	Game Theory	
L14	Game Theory	
L15	Game Theory	
L16	Network Scheduling	2 Classes
L17	Network Scheduling	
L18	Network Scheduling	
L19	Network Scheduling	
L20	Network Scheduling	
Class Test		

Lesson Plan

Name of Assistant / Associate Professor / SACT : SANDIP KUMAR SAO Class and Section: B Sc. (Hons.) in Computer Science – 3rd Semester Course Title: Programming in Java Course Type: CC – 7 Credit: 6	
Lesson Plan from August 2021 to December. 2021	
August 2021	
Topic Covered	
Week 1	Paradigms of programming languages, OO methodology, OO approach
Week 2	Comparison of OO and procedure oriented approach, benefits and application of OOPs
Week 3	OO language, class and objects, Abstraction,
Week 4	Encapsulation, inheritance, method overriding and polymorphism
September 2021	
Topic Covered	
Week 1	Basic features of Java, JVM, data types, variables, operators, expressions, statements, arrays
Week 2	Class fundamentals, objects creation, assigning object reference variables, methods, static methods
Week 3	Constructors, overloading Constructors, this keyword, using objects as parameters, argument passing, returning objects, method overloading, garbage collection,
Week 4	Finalize method(), inheritance, polymorphism, final keyword
October 2021	
Topic Covered	
Week 1	Defining package, CLASSPATH, package naming, accessibility of packages, package members
Week 2	Interface, abstract classes, extends and implements together
November 2021	
Topic Covered	
Week 1	Handling of exception, using try catch, multiple exceptions
Week 2	Using finally clause, types of exceptions, throwing exceptions, exception subclasses
Week 3	Main thread, java thread model, thread priorities, synchronisation in java, inter thread communication
December 2021	
Topic Covered	
Week 1	I/O basics, stream and stream classes, predefined
Week 2	Streams reading from and writing to, console
Week 3	Reading and writing files, transient and volatile modifiers, instance native methods

Lesson Plan

Name of Assistant / Associate Professor / SACT : SANDIP KUMAR SAO Class and Section: B Sc. (Hons.) in Computer Science – 5th Semester Course Title: Numerical Methods Course Type: DSE – 1 Credit: 6	
Lesson Plan from August 2021 to December. 2021	
August 2021	
Topic Covered	
Week 1	Errors in Computation.
Week 2	Interpolation: Newton's Forward and Backward Interpolation, Lagrange's Interpolation.
Week 3	Interpolation: Lagrange's Interpolation.
Week 4	Solution of Linear Equation Systems: Gauss Elimination Method
September 2021	
Topic Covered	
Week 1	Solution of Linear Equation Systems: Gauss-Seidel Method,
Week 2	Solution of Linear Equation Systems: Convergence and Errors.
Week 3	Solution of Non-Linear Equation Systems: Bisection Method, Regula-Falsi Method
Week 4	Solution of Non-Linear Equation Systems: Secant Method
October 2021	
Topic Covered	
Week 1	Solution of Non-Linear Equation Systems: Newton-Raphson Method, Convergence and its Graphical Significance.
Week 2	Solution of Differential Equations: Euler Method
November 2021	
Topic Covered	
Week 1	Solution of Differential Equations: Runge-Kutta Method Second Order
Week 2	Solution of Differential Equations: Runge-Kutta Method Fourth Order
Week 3	Integration: Trapezoidal Rule, Simpson's 1/3 Rule.
December 2021	
Topic Covered	
Week 1	Errors in Computation. Interpolation: Lagrange's Interpolation. Solution of Linear Equation Systems: Gauss-Seidel Method
Week 2	Solution of Differential Equations: Euler's Method, Runge-Kutta Method Second Order and Fourth Order
Week 3	Remedial classes.