2022-2023

Title	Syllabus Distribution
Session	2022-23 (Odd Semester)
Department	B.Sc General in Computer Science
Institution Name	Hiralal Bhakat College, Nalhati, Birbhum, W.B.
Coordinator	Sk Abdul Hanif, SACT in Computer Science

Details of Courses of B.Sc. General under CBCS

Sl.	Course	Credit		Marks
1.	Core Course (12 Papers) 4 core papers each in 3 disciplines of choice	Theory+Practical 12×(4+2)=72	Theory+Tuitorial 12×(5+1)=72	12×75=900
2.	Elective Course DSE (6 Papers)	6×(4+2)=36	6×(5+1)=36	6×75=450
3	Ability Enhancement Core Course (AECC) AECC-1 (ENVS) AECC-2 (English/MIL)	 4×1=4 2×1=2	 4×1=4 2×1=2	 100 50
4.	SEC (4 Papers)	4×2=8	4×2=8	4×50=200
	Total Credit:	122	122	1700

B.Sc. Computer Science General Course Structure

Semester	Course Course (CC)	Discipline Specific Elective (DSE)	Ability Enhancement Course	
			AECC (2)	SEC (4)
I	CC1A (Mathematics) CC2A (Physics) CC3A (Computer Sc.)		AECC-1	
II	CC1B (Mathematics) CC2B (Physics) CC3B (Computer Sc.)		AECC-2	
III	CC1C (Mathematics) CC2C (Physics) CC3C (Computer Sc.)			SEC-1 (Mathematics) or SEC-1 (Computer Sc.)
IV	CC1D (Mathematics) CC2D (Physics) CC3D (Computer Sc.)			SEC-2 (Mathematics) or SEC-2 (Computer Sc.)
V		DSE1A (Mathematics) DSE2A (Physics) DSE3A (Computer Sc.)		SEC-3 (Computer Science) or SEC-3 (Physics)
VI		DSE1B (Mathematics) DSE2B (Physics) DSE3B (Computer Sc.)		SEC-4 (Computer Science) or SEC-4 (Physics)

Semester-I

Core Course (CC 3A): Problem Solving using Computer

SEMESTER – I

Course code	Course title	Credit	No of Hours		
			L	T	P
CC-1A	Problem solving Using Computer	4-0-2=6	4	0	4
	Discipline 2	6		-	
	Discipline 3	6			
	AECC1:Environmental studies	4			
		22			

Syllabus	Number of Lecture	Course	Name of Teacher
Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers.Basic Computer Organization: Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices. Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.	**10 L**	CC	Sk Abdul Hanif
Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.Structure of a Python Program, Elements of Python.Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment,	**16L**		
Input and Output Statements, Control statements (Looping- while loop, for loop , loop Control, Conditional Statement, if...else , Difference between break, continue and pass).Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.	**20 L**		
Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.	**14L**		
Section: A (Simple programs). **Section: B (Visual Python):**		**Practical**	Sk Abdul Hanif

Reference Books:

1. P. K. Sinha & Priti Sinha , ―Computer Fundamentals‖, BPB Publications, 2007.
2. Python Programming- Reema Thareja
3. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
4. T. Budd, Exploring Python, TMH, 1st Ed, 2011
5. Python Tutorial/Documentation www.python.or 2010
6. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
7. http://docs.python.org/3/tutorial/index.html
8. http://interactivepython.org/courselib/static/pythonds
9. http://www.ibiblio.org/g2swap/byteofpython/read/

Semester-III

Core Course (CC 3C) : Operating Systems

SEMESTER – III

Course code	Course title	Credit	No of Hours		
			L	T	P
CC-1C	Operating Systems	4-0-2=6	4	0	4
	Discipline 2	6			
	Discipline 3	6			
SEC-1 (Computer Science)	Office Automation Tools **OR** System Administration and Maintenance	1-0-1=2	1	0	2
		20			

Syllabus	Number of Lecture	Course	Name of Teacher
Introduction: System Software, Resource Abstraction, OS strategies. Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems. **Operating System Organization**: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.	**14 L**	CC	Sk Abdul Hanif
Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model	**15 L**		
Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies. Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory	**24 L**		
Shell introduction and Shell Scripting (7L)	**7 L**		
Software Lab based on Operating Systems 1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd. 2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date. 3. Usage of following commands: chmod, grep, tput (clear, highlight), bc. 4. Shell script programs		**Practical**	Sk Abdul Hanif

Books Recommended:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
2. Operating Systems: Internals and Design Principles - Willim Stalling
3. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
4. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997.
5. W. Stallings, Operating Systems, Internals & Design Principles , 5th Edition, Prentice Hall of India. 2008.
6. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

SEC-1 : Office Automation Tools

SEC-1 : Office Automation Tools
Theory: 20 Lectures Credit: 2

Introduction to open office/MS office/Libre office **(2L)**

Word Processing: Formatting Text, Pages, Lists, Tables (6L)

Spreadsheets: Worksheets, Formatting data, creating charts and graphs, using formulas and functions, macros, Pivot Table (6L)

Presentation Tools: Adding and formatting text, pictures, graphic objects, including charts, objects, formatting slides, notes, hand-outs, slide shows, using transitions, animations (6L)

Books Recommended:

1. Sushila Madan , Introduction to Essential tools,JBA,2009.
2. Anita Goel, Computer Fundamentals, Pearson, 2012

Semester-V

DSE-3A : Programming in Java

SEMESTER – V

Course code	Course title	Credit	No of Hours		
			L	T	P
DSE 1A	Programming in Java **OR** Software Engineering	4-0-2=6	4	0	4
DSE 2A	Discipline 2	6			
DSE 3A	Discipline 3	6			
SEC-3 (Computer Science)	MySQL / PL-SQL **OR** Concepts of Software Testing	1-0-1=2	1	0	2
		20			

Syllabus	Number of Lecture	Course	Name of Teacher
Introduction to Java: Features of Java, JDK Environment.Object Oriented Programming Concept Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA.Java Programming Fundamental :Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting	**21 L**	DSE	Sk Abdul Hanif
Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes.Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods	**16 L**		
Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages. Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.	**12 L**		
File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File. Applet Programming: Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag	**11 L**		
Software Lab based on Java		**Practical**	Sk Abdul Hanif

SEC-3 : Concepts of Software Testing

SEC – 3: Concepts of Software Testing **(1+2 Labs)**
Theory: 20 Lectures Credit: 2

Introduction **(5L)**

Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System Testing, Basic Terminologies, V Shaped Software Lifecycle Model

Functional Testing\ Black-box Testing **(7L)**

Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing

Structural Testing\ White-box Testing **(8L)**

Basis Path Testing: Program Graph, DD Path graph, Cyclomatic Complexity, Graph Matrices, Control Flow Testing: Statement Coverage, Branch Coverage, Condition Coverage, Path Coverage

Books Recommended:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, Seventh Edition, Mc Graw Hill Education.2009.
2. Yogesh Singh, Software Testing, Cambridge University Press,2011.

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