

3rd SEMESTER SYLLABUS
Bachelor of Computer Science
DEPARTMENT OF COMPUTER SCIENCE & IT
COTTON UNIVERSITY

PAPER: CSC301C

OBJECT ORIENTED PROGRAMMING USING C⁺⁺
(Credits: 3+1+1=5)

UNIT I: Introduction to object oriented programming [6 Lectures]

Different paradigms for problem solving, need for OOP, differences between OOP and procedure oriented programming, abstraction, overview of OOP principles- encapsulation, inheritance and data binding polymorphism.

UNIT II: C++ basics [8 Lectures]

Structure of a C++ program, data types, declaration of variables, expressions, operators, type conversions, pointers and arrays, strings, structures, references, flow control statement, functions- scope of variables, parameter passing, recursive functions, default arguments, inline functions, dynamic memory allocation and deallocation operators.

UNIT III: Objects and classes [6 Lectures]

Encapsulation, information hiding, abstract data types, Object & classes, attributes, functions, C++ class declaration, member functions, State identity and behavior of an object, static data members and member functions, friend functions, constant member functions.

UNIT IV: Constructors and operator overloading [8 Lectures]

Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, Metaclass/abstract classes. Operator overloading: Overload unary, binary operators, overloading binary operators using friends, manipulation of strings using operators.

UNIT V: Inheritance and polymorphism [10 Lectures]

Inheritance: defining a class hierarchy, different forms of inheritance, defining the base and derived classes, access to the base class members, base and derived class construction, destructors, virtual base class. Polymorphism: static and dynamic bindings, base and derived class virtual functions, dynamic binding through virtual functions, virtual function call mechanism, pure virtual functions, abstract classes, implications of polymorphic use of classes, virtual destructors.

UNIT VI: Exception Handling and files [10 Lectures]

Exception handling: benefits of exception handling, throwing an exception, the try block, catching an exception, exception objects, exception specifications, rethrowing an exception, catching all exceptions. File handling : stream classes hierarchy, stream I/O, file streams, opening and closing data file, creating a data file, read and write functions, error handling during file operations, formatted I/O, sequential and random file processing.

Textbooks:

1. Herbert Schild, “ The complete reference to C++”, Osborn McGraw Hill

Recommended Books:

1. R. Lafore, “Object Oriented Programming using C++”, Galgotia Publications

2. Ian Graham, “Object Oriented Methods”, Addison Wesley..

3. E. Balaguruswamy, “Object Oriented Programming with C++”, Tata McGraw Hill

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PAPER: CSC302C

COMPUTER ORGANIZATION AND ARCHITECTURE
(Credits: 3+1+1=5)

UNIT I: Data representation [6 Lectures]

Data types, fixed-point representation, floating – point representation, other binary codes, error detection codes.

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit.

UNIT II: Basic computer organization and design [8 Lectures]

Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Register reference instructions, Input – Output Instructions, Design of Accumulator Logic.

UNIT III: Central processor organization [8 Lectures]

Processor bus organization, arithmetic logic unit (ALU) instruction formats, addressing modes, data transfer and manipulation, program control, microprocessor organization.

UNIT IV: Input-output organization [8 Lectures]

Peripheral devices, asynchronous data transfer, direct memory access (DMA) ,priority interrupt, input –output processor (IOP).

UNIT V: Memory organization [8 Lectures]

Auxiliary memory, microcomputer memory hierarchy , associative memory , virtual memory, cache memory.

UNIT VI: 8085A microprocessor[10 Lectures]

Internal architecture of 8085 microprocessor, User Programmable registers, PC, SP, accumulator, flags, data bus, address bus, control bus, instruction word size, opcode format, data format. Assembly language programming in 8085A microprocessor: Complete instruction set in detail, programming examples, logic operation, counters and time delays, stack and subroutine, processing arrays, bit manipulation.

Textbooks:

1. M.Moris Mano , Computer System, Architecture, 2nd Edition Prentice Hall of India.

Recommended Books:

1. Heuring and Jordan, Computer systems design and Architecture , Peason Edition
2. William Stallings , Computer Organisation and Archotecture, Peason Education
3. Floyed , Digital Fundamentals,8th Edition , Peason Education.
4. Andrew S. Temenbauam, Structured Computer Organization , 3rd Edition ; Prentice Hall of India.
5. David Patterson & Hennessy , Computer Organization & Design , Elsevier.

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PAPER: CSC303C

SYSTEM PROGRAMMING
(Credits: 3+1+1=5)

UNIT I: Background [8 lectures]

Introduction, brief description and functions of Assembler, Loaders, Linkers, Macros, Compilers, Interpreters.

UNIT II: Assemblers [10 lectures]

Assembly language, Assembly process, Data structures, Macros and macroprocessors.

UNIT III: Macro language and the macro processor [10 lectures]

Macroinstruction, Features of macro facility, Macro instruction arguments, conditional macro Expansion, macro calls within macros, macro instructions defining macros., Implementation, Statement of problem, implementation of a restricted facility, A two pass algorithm, A single pass algorithm, implementation of macro calls within macros. Implementation within an assembler

UNIT IV: Linkers & loaders [8 lectures]

Basic concepts, Static and dynamic linking, Loader schemes, Compile & go, General loading Scheme, absolute loaders, Subroutine Languages, Relocating loaders, Direct linking loaders, other loading Schemes – Binders, linking loaders, Overlays, Dynamic binders. Design of absolute loader., Design of a Direct linking loader Specification of problem, Specification of data structure, format of databases algorithm.

UNIT V: Compilers [12 lectures]

Introduction to Compilers, Phases of compiler.

Textbooks:

1. Dhamdhere: System programming and Operating System TMH

Recommended books:

1. John J. Donowon , System Programming, TATA McGraw-Hill.
2. Beck: System Software, 3/e Pearson Education
