SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2201	PROGRAMMING IN C++	3	1	0	4	4

COURSE PREAMBLE: The objective of course is to develop programming skills of students, using object oriented programming concepts, learn the concept of class and object using C++ and develop classes for simple applications.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Identify importance of object oriented programming and difference between structured oriented and object oriented programming features.
- Able to make use of objects and classes for developing programs.
- Able to use various object oriented concepts to solve different problems.

UNIT-I

Introduction: Comparison of C and C++, Cout, Cin, Data Type, Type Conversion, Control Statement, Loops, Arrays and string arrays fundamentals, Function, Returning values from functions, Reference arguments, Overloaded function, Inline function, Default arguments, Returning by reference.

UNIT-II

Object and Classes: Implementation of class and object in C++, access modifiers, object as data type, constructor, destructor, Object as function arguments, default copy constructor, parameterized constructor, returning object from function, Structures and classes, Classes objects and memory, static class data, Arrays of object, Arrays as class Member Data, The standard C++ String class, Run time and Compile time polymorphism.

UNIT-III

Operator overloading and Inheritance: Overloading unary operators, Overloading binary operators, data conversion, pitfalls of operators overloading, Concept of inheritance, Derived class and base class, access modifiers, types of inheritance, Derived class constructors, member function, public and private inheritance.

UNIT-IV

Pointer and Virtual Function: Addresses and pointers, the address-of operator & pointer and arrays, Pointer and Function pointer, Memory management: New and Delete, pointers to objects, debugging

pointers, Virtual Function, friend function, Static function, friend class, Assignment and copy initialization, this pointer, dynamic type information

UNIT-V

Streams and Files: Streams classes, Stream Errors, Disk File I/O with streams, file pointers, error handling in file I/O with member function, overloading the extraction and insertion operators, memory as a stream object, command line arguments, printer output, Function templates, Class templates Exceptions, Containers, exception handling.

REFERENCES:

1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore: Galgotia
3. Balagurusamy; Object oriented programming with C++; TMH
4. Herbert Shildt, “The Complete Reference C++”, Tata McGraw Hill publication

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2202	DATABASE MANAGEMENT SYSTEM	3	1	0	4	4

COURSE PREAMBLE: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Upon successful completion of this course, students should be able to:
- Describe the fundamental elements of relational database management systems
- Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
- Design ER-models to represent simple database application scenarios

UNIT-I

Basic Concepts: - DBMS Concepts and architecture, Introduction, Review of file organization techniques, Database approach v/s Traditional File accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Functions of DBA and designer, Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database,

UNIT-II

Data models and Relational Databases: - Various data models, Basic concepts of Hierarchical data model, Network data model, and Relational data model, Comparison between the three types of models, Relational Data models: - Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension,

UNIT-III

Relational Query languages & SQL: - Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. SQL: - Data definition in SQL, update statements and views in SQL, QUEL & QBE, Data storage and definitions, Data retrieval queries and update statements.

UNIT-IV

Database Design:- Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multi-valued dependencies.

UNIT-V

Advance Concepts:- Introduction of Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery and transaction processing, basic concepts
of object oriented data base system and design.

References:

1. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3. Toledo; Data base management systems;TMH
4. Panneeselvam "Database Management System" PHI
5. Date C J, "An Introduction To Database System", Addision Wesley
6. Ashutosh Kumar Dubey "Data Base Management Concepts" Katson Publication

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2203	OPERATING SYSTEM	3	1	0	4	4

COURSE PREAMBLE: To learn the fundamentals of Operating Systems. Mechanisms of OS to handle processes and threads and their communication mechanisms involved in memory management in contemporary OS. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Students demonstrate an ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
- Students demonstrate an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

UNIT-I

Introduction: Evolution of operating systems (History of evolution of OS with the generations of computers), Types of operating systems, Multitasking, Timesharing, Multithreading, Multi programming and, Real time operating systems, Different views of the operating system.

UNIT-II

Processes: The Process concept, The process control block, Systems programmer's view of processes, Operating system services for process management, Scheduling algorithms, First come first serve, Round Robin, Shortest run time next, Highest response ratio next, Multilevel Feedback Queues, Performance evaluation of scheduling algorithms stated above.

UNIT-III

Memory Management : Memory management without swapping or paging, Concepts of swapping and paging, Page replacement algorithms namely, Least recently used, Optimal page replacement, Most recently used, Clock page replacement, First in First out (This includes discussion of Belady's anomaly and the category of Stack algorithms), Modeling

paging algorithms, Design issues for paging system, Segmentation, Segmented Paging, Paged Segmentation.

UNIT-IV `

Deadlocks: Concepts of deadlock detection, deadlock prevention, deadlock avoidance. Banker's Algorithm Inter-process Communication and Synchronization: The need for inter-process synchronization, Concept of mutual exclusion, binary and counting semaphores, hardware support for mutual exclusion.

UNIT-V

Disks: Disk hardware, Disk scheduling algorithms (namely First come first serve, shortest seek time first, SCAN, C-SCAN, LOOK and C-LOOK algorithms) Error handling, track-at-a-time caching, RAM Disks. Clocks: Clock hardware, memory-mapped terminals, I/O software.

Reference Books:

1.Galvin P.L.Abraham Silberschatz. "Operating System Concepts". John Wiley & Sons Company.

2. William Stallings "Operating Systems" , Prentice Hall of India Pvt. Ltd.
3. Joshi R.C. "Operating System" Wiley India

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2204	THEORY OF COMPUTATION & ALGORITHM	3	1	0	4	4

COURSE PREAMBLE: To make the students aware of and well-groomed in the use of the tools & Techniques of designing and analyzing algorithms and to understand Regular languages, Context free grammar, Use the Turing machine and an un-decidable problem

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Apply the acquired knowledge of finite automata theory and design discrete problems to solve by computers.
- Understand and implement the features DFA, NFA, Transition systems and Conversion of NDFA to DFA.

UNIT – I

Theory of automata: Theory of automata, Strings Alphabets and language, Finite state systems, Deterministic finite automata with moves, Two way finite automata, finite automata with output, Mealy & Moore machines

UNIT – II

NFA and DFA: Description, DFA,NFA, Transition systems, Conversion of NDFA to DFA, Removal of ∈ transition from ∈ – NDFA, Pumping lemma for regular set, Closure properties of regular set, Decision algorithm for Regular set, Myhill - Nerode theorem and initialization of finite automata Regular Expression and Language.

UNIT – III

Regular languages: Context free grammar, Chomsky Normal form, Greibach Normal form, Pumping lemma for CFL, Application for CFL of Pumping lemma. Closure properties of CFL, CYK algorithm, YACC, Introduction to LR grammar.

UNIT – IV

Pushdown automata: Informal description Definition Equivalence of PDA's and CFL's Prop Turning machine construction. Modification of turning machine.

UNIT – V

Undecidability Universal turing machine and an undecidable problem Rice theorem, Greibach theorem. Recursion finite theory, Chomsky hierarchy, Unrestricted Grammar. Context sensitive Language Computational Complexity theory, Intractable problem.

Reference Books

1. Introduction to Automata Theory Language and Computation, By John E. Hopcraft & Jeffary D. Ullman
2. Introduction to Automata Theory Language and Computation,By John E. Hopcraft Jeffary D. Ullman & Rajeev Motwani.
3. Theory of Computer Science K.L.P. Mishra, N. ChandraShekaran.

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2205	E-COMMERCE & GOVERNANCE	3	1	0	4	4

COURSE PREAMBLE: The primary objective for most ecommerce teams is to generate revenue – to be very efficient at selling through understanding complex consumer behavior to maximize conversion rates; and up-sell and cross-sell products and services to maximize value over the lifetime of the customer.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- To protect and promote the interest of trade, commerce and industry.
- To unite people engaged in trade, commerce and industry for concerted action to protect and promote their common interests.
- To take interest in and formulates it's view matters directly or indirectly affecting the business community.

Unit I

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal; environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

Unit II

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

Unit III

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

Unit IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nation wide networking in e-governance, e-seva.

Unit V

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

Reference Books:

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2.C.S.R. Prabhu, "E-governence: concept and case study", PHI Learning Private Limited.
3.V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4.David Whiteley, "E-commerce study , technology and applications", TMH.

SCHOOL OF ENGINEERING

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Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2206	LAB-III (PROGRAMMING IN C++)	0	0	8	4	8

COURSE PREAMBLE: The primary objective for Programming in C++ is to Introduces the principles of data abstraction, class, inheritance and polymorphism, principles of virtual functions .

COURSE OUTCOMES:

At the end of the Course, the student will be able

Ability to develop applications for a range of problems using Programming in C++ techniques.

LIST OF EXPERIMENTS:-

1. Write a program to find minimum of three numbers using conditional operator.
2. Write a program to swap two numbers (call by reference)
3. Write a program to find the product of two matrices.
4. Write a program to arrange the array elements in ascending order.
5. Write a program to count number of words, characters, vowels in a given string.
6. Write a program to declare a class. Declare pointer to class. Initialize and display the contents of the class member.
7. Write a program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.
8. Write a program to overload unary operator using friend function.
9. Write a program to overload – operator.
10. Write a program to invoke Constructor and Destructor.

Reference Books:

1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore: Galgotia
3. Balagurusamy; Object oriented programming with C++; TMH
4. Herbert Shildt, “The Complete Reference C++”, Tata McGraw Hill publication

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Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2207	LAB-IV (DBMS (ORACLE/MY SQL))	0	0	2	1	2

COURSE PREAMBLE: The primary objective for DBMS (ORACLE/MY SQL) lab to explain basic database concepts, applications, data models, schemas and instances.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Apply the basic concepts of Database Systems and Applications.
- Use the basics of SQL and construct queries using SQL in database creation and interaction. Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
- Analyze and Select storage and recovery techniques of database system.

LIST OF EXPERIMENTS:-

1. Study of DBMS, RDBMS and ORDBMS.
2. To study Data Definition language Statements.
3. To study Data Manipulation Statements.
4. Study of SELECT command with different clauses.
5. Study of SINGLE ROW functions (character, numeric, Data functions).
6. Study of GROUP functions (avg, count, max, min, Sum).
7. Study of various type of SET OPERATORS (Union, Intersect, Minus).
8. Study of various type of Integrity Constraints.
9. Study of Various type of JOINS.
10. To study Views and Indices

Reference Books:

1. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addision Wesley.
2. Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill.
3. Toledo; Data base management systems; TMH.
4. Ashutosh Kumar Dubey “Data Base Management Concepts” Katson Publication.