



School of Applied Sciences

Centurion University of Technology & Management

COURSE STRUCTURE AND SYLLABUS

FOR

2 YEARS MASTER DEGREE OF SCIENCE

In

Information Technology

2016-17

Course Structure

SEMESTER-I				
Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	MSIT4101	Mathematical Foundations Of Computer Science	3+1+0	4
2	MSIT4102	Data Structures Using C/C++ OBJECT	3+1+0	4
3	MSIT4103	Object Oriented Programming Using Java	3+1+0	4
4	MSIT4104	Computer System Organization	3+1+0	4
5		Skill Elective I	3+1+0	4
6	MSIL4101	Data Structures Using C/C++ Lab	0+0+3	2
7	MSIL4102	Object Oriented Programming Using Java Lab	0+0+3	2
TOTAL CREDITS				24

SEMESTER-II				
Sl no	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	MSIT4201	Design And Analysis Of Algorithms	3+1+0	4
2	MSIT4202	Database Management Systems	3+1+0	4
3	MSIT4203	Data Communication And Computer Networks	3+1+0	4
4	MSIT4204	Design And Analysis Of Algorithms Lab	3+1+0	2
5		Skill Elective II	3+1+0	4
6	MSIL4201	Database Management Systems Lab	0+0+3	2
7	MSIL4202	Data Communication And Computer Networks Lab	0+0+3	2
TOTAL CREDITS			22	

Skill Elective Subjects

Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1.	MSIS4781	Web Programming	3+1+0	4
2.	MSIS4782	Business Intelligence & Application	3+1+0	4
3.	MSIS4783	Cisco Computer Networking Fundamentals	3+1+0	4
4.	MSIS4784	Dot Net Using C++	3+1+0	4
5.	MSIS4785	Project Based C – Programming	3+1+0	4
6.	MSIS4786	Mat Lab	3+1+0	4

SEMESTER-III				
Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	MSCI2301	Advanced Theory Of Computation	3+1+0	4
2	MSCI2302	Advanced Cryptography & Network Security	3+1+0	4
3	MSCI2303	Advanced Operating Systems	3+1+0	4
4		Elective I	3+1+0	4
5	MSIL2301	Operating Systems Lab	3+1+0	4
6	MSRM5101	Introduction To Research	2+0+0	2
7	MSIP2301	Minor Project	0+0+3	2
TOTAL CREDITS				24

SEMESTER-IV				
Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	MSCI2401	Quantitative Techniques	3+1+0	4
2	MSCI2402	Object Oriented Software Engineering	3+1+0	4
3		Elective II	3+1+0	4
4	MSIL2401	Object Oriented Software Engineering Lab	0+0+3	2
5	MSIS2401	Seminar	0+0+3	2
6	MSIP2401	Major Project		10
TOTAL CREDITS				26

Elective Subjects

Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1.	MSIE2401	Big Data Analytics	3+1+0	4
2.	MSIE2402	Mobile Applications & Computing	3+1+0	4
3.	MSIE2403	Computer Graphics & Multimedia	3+1+0	4
4.	MSIE2404	Cloud Computing Techniques	3+1+0	4
5.	MSIE2405	Data Mining & Data Warehousing	3+1+0	4
6.	MSIE2406	E-Business & ERP	3+1+0	4
7.	MSIE2407	Internet Of Things	3+1+0	4
8.	MSIE2408	Information Systems	3+1+0	4
9.	MSIE2409	Communication And Interpersonal Skills For Corporate Readiness	3+1+0	4

Detail Syllabus M.Sc.

(IT)

First Semester

MSIT4101 Mathematical Foundations of Computer Science (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4101	Mathematical Foundations of Computer Science	4	3+1 + 0

Module-I

(16 Lectures)

Propositional logic: Proposition logic, basic logic, logical connectives, truth tables, tautologies, contradiction, normal forms (conjunctive and disjunctive), modus ponens and modus tollens, validity, predicate logic, universal and existential quantification. Notion of proof: proof by implication, converse, inverse, contrapositive, negation, and contradiction, direct proof, proof by using truth table, proof by counter example.

Integers: greatest common divisor, Euclidean algorithm.

Mathematical reasoning: Proof strategies, Mathematical Induction, Recursive definitions, Structural Induction. Sequences and Summations

Counting: basic rules, Pigeon hole principle, Permutations and combinations, Binomial coefficients and Pascal triangle.

Module-II

(17 Lectures)

Sets: Definition of Sets, Venn Diagrams, complements, Cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), proofs of some general identities on sets.

Relation: Definition, types of relation, composition of relations, domain and range of a relation, pictorial representation of relation, properties of relation, partial ordering relation.

Function: Definition and types of function, composition of functions, recursively defined functions.

Module-III

(15 Lectures)

Probability: Discrete probability. Expected values and variance.

Graph Theory: Graph terminology, types of graph connected graphs, components of graph, Euler graph, Hamiltonian path and circuits, Graph coloring, Chromatic number.

Tree: Definition, types of tree (rooted, binary), properties of trees, binary search tree, tree traversing (preorder, inorder, postorder).

Text Book:

1. Bernard Kolman, Robert Busby, Sharon C. Ross, "Discrete Mathematical Structures", Sixth Edition, 2008, Pearson Education Inc., New Delhi. / Prentice Hall of India (PHI) Pvt. Ltd., New Delhi. **Reference**

Books:

1. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", Sixth Edition, 2008, Tata McGrawHill (TMH) Publications Pvt. Ltd., New Delhi.
2. D. S. Malik & M. K. Sen, "Discrete Mathematical Structures", First Edition, 2005, CENGAGE Learning India Pvt. Ltd., New Delhi.
3. Judith L. Gersting, "Mathematical Structures for Computer Science: A Modern treatment to Discrete Mathematics", Fifth / Sixth Edition (Asian Student Editions), 2008, W. H. Freeman & Company, New Delhi.
4. Richard Johnsonbaugh, "Discrete Mathematics", Seventh Edition, 2008, Pearson Education Inc., New Delhi.

MSIT4102 Data Structures Using C/C++ OBJECT (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4102	Data Structure Using C/C++OBJECT	4	3+1 + 0

MODULE-I

(16 Lectures)

Introduction to Algorithm, Flowchart. Asymptotic Notations (Big oh, little oh, Theta, Big omega, little omega), time complexity and space complexity of an algorithm. Pseudocode for expressing algorithms.

Introduction to Data Structures: Data Structures, Need of data structure, various types of data structure (Primitive & non-primitive, Static & dynamic, Homogeneous & non-homogeneous, Linear & non-linear), ADT.

Linear Structures of Array: Memory representation, Array Implementation (insertion, deletion and traverse), application of array, sparse matrix, Advantages and Disadvantages of array. Link list: Memory representation, implementation and application, Polynomials, Doubly Linked Lists, Circular Linked Lists. Advantages and Disadvantages of linked list. Stack: Memory representation, implementation and application of stack (Conversion from Infix to Postfix, Conversion from Postfix to Infix, Evaluation of prefix expressions, Evaluation of postfix expressions), Linked stacks and queues, Disadvantages of stack. Queue: Queues: Memory representation, implementation and application of a queue, Priority Queues, Circular Queues. Advantages and Disadvantages of queues.

MODULE-II

(18 Lectures)

Tree: Concept of tree, Definition, Binary tree, Complete binary tree, Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, linked list representation of tree. Creation of binary tree from a general tree. Traversal of Binary Tree: Preorder, Inorder and postorder.

MODULE-III

(16 Lectures)

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees. Sorting and searching: Bubble, Selection, Insertion, Heap sort, Radix sort, linear search and binary search.

Text Books:

1. Data Structures: Seymour Lipschutz

Reference Books:

1. Data Structures in C by Tanenbaum.
2. Fundamentals of Data Structure by Sahany 3.Data Structures, by Tremblay and Sorenson.
4. Data Structure & Algorithms using C ,Amitav Nag and J P Singh, 2nd Edition, Vikas Publishing House Pvt Ltd.

MSIT4103 Object Oriented Programming Using Java (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4103	Object Oriented Programming Using Java	4	3 + 1 + 0

Module –I

(16 Lectures)

Introduction to Java and Java programming Environment. Object Oriented Programming. Fundamental Programming Structure: Data Types, variable, Typecasting Arrays, Operators and their precedence.

Control Flow: Java's Selection statements.

Concept of Objects and Classes, constructor overloading, static, final this keyword, Inheritance, Method overriding, Dynamic method Dispatch, Using Abstract Classes

Packages and interfaces: Packages, Access Protection, Importing package, Interface, Implementing Interfaces, variables in Interfaces, Interfaces can be extended.

Module –II

(16 Lectures)

Exception Handling: Fundamentals, Types Checked , Unchecked exceptions, Using try & catch, Multiple catch, throw , throws, finally, Java's Built in exceptions, user defined exception. Multi-threading, Java Thread Model, Thread Priorities, Synchronization, Creating a thread, Creating Multiple threads, Using is Alive () and join (), wait () & notify ()

String Handling: String constructors, String length, Character Extraction, String Comparison, Modifying a string.

Exploring Java-lang: Simple type wrappers, Runtime memory management, object (using clone () and the cloneable Interface). Java util, Java I/O, Java Networking:

Module III

(18 Lectures)

Applets: Basics, Architecture, Skeleton, The HTML APPLET Tag, Passing Parameters to Applets, Applet context and show documents ().

Event Handling: Delegation Event model, Event Classes, Event Listener Interfaces, Adapter classes

AWT :AWT Classes window fundamentals, component, container, panel, Window, Frame , Canvas,

Creating a frame window in an Applet , working with Graphics , Control Fundamentals , Layout managers, Handling Events by Extending AWT components. Core java API package, reflection,

Swing: J applet, Icons & Labels, Text fields, Buttons, Combo boxes, Tabbed panes, Scroll panes, Trees, Tables.

JDBC: Fundamentals, Type I, Type II, Type III, Type IV drivers.

Text Books:

1. Java complete Reference, Herbert Schild, fifth edition chapters **Reference Books:**

1. Balguruswamy, Programming with JAVA, TMH.
2. Programming with Java: Bhav &. Patekar, Pearson Education.
3. Big Java: Horstman, Willey India, 2nd Edition

MSIT4104 Computer System Organization (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4104	Computer System Organization	4	3 + 1 + 0

Module –I

(16 Lectures)

Overview of computer structure: Functional units, operational concepts, Bus structures, Software, Performance, Computer Architecture vs Computer Organization.

Machine Instruction and Programs: Memory location and addresses, Big-endian and Little-endian representation. Subroutine, additional instructions. Instruction set processor design, Principles of processor performance, RISC and CISC architectures. Architectural classification of parallel processing (FLYNN'S), Pipelining fundamentals, Pipeline hazards.

Module – II

(16 Lectures)

Arithmetic : Addition and subtraction of signed Numbers, Design of Fast Adders, Multiplication of positive Numbers, Signed-operand multiplication , Fast multiplication, Integer Division, Floating- point Numbers, (IEEE754 s...) and operations, Floating point Addition and subtraction algorithm.

Module – III

(18 Lectures)

Input-output organization: Hardwired control, Micro programmed control. Basic Input/output operations, Basic Input/output operations with Single Bus and multiple Bus, Programmed I/O, DMA

Memory: Hierarchical memory technology, Basic Concepts, Paging, Segmentation, cache Memory, Cache memory mapping policies, Cache updating schemes, Multi-level caches, performance consideration, Virtual memory management, Demand paging, Page replacement policies.

Text Books:

1. Computer Organization: Carl Hamacher, Zvonkovranesic, SafwatZaky, McGraw Hill, 5th Ed
2. Computer Organization and Design Hardware/ Software Interface: David A. Patterson, John L. Hennessy, Elsevier, 4th Edition.

Reference Book:

1. Computer Architecture and Organization: William Stallings, Pearson Education.
2. Computer system Architecture: Morris M. Mano PHI NewDelhi.
3. Structured Computer Organization: A.S. Tanenbum, PHI

MSIL4101 DATA STRUCTURES USING C/C++ LAB (0-0-3)

Code	Course Title	Credits	L + T + P
MSIL4101	Data Structures Using C/C++ Lab	2	0 + 0 + 3

1. Write a Program to Traverse an Array.
2. Write a Program to Insert and delete an Item into an Array.
3. Write a program to search an element using sequential search.
4. Write a program to search an element using binary search.
5. Write a program to implement stack operation using array.
6. Write a program to convert an infix to postfix notation using stack.
7. Write a program for stack implementation using linked list.
8. Write a program to implement queue operation using array.
9. Write a program to implement circular queue operation using array.
10. Write a program for queue implementation using linked list.
11. Write a program to implement link list (creation, insertion, deletion).
12. Write a program to implement circular link list (creation, insertion).
13. Write a program to implement double link list (creation, insertion).
14. Write a program to construct binary tree.
15. Write a program to traverse (in order, preorder, post order any one .
16. Write a program to sort N number of elements using bubble sort.
17. Write a program to sort N number of elements using quick sort.
18. Write a program to sort N number of elements using merge sort.
19. Write a program to sort N number of elements using selection Sort.
20. Write a program to sort N number of elements using insertion Sort.

MSIL4102 Object Oriented Programming Using Java Lab

Code	Course Title	Credits	L + T + P
MSIL4102	Object Oriented Programming Using Java Lab	2	0 + 0 + 3

1. JDK Installation Procedure and Simple Java Programs with control statements and using Arrays.
2. Write java programs using concept of Inheritance.
3. Write java programs using concept of Interfaces.
4. Write java programs using concept of String handling.
5. Write java programs using concept of Package.
6. Write java programs using concept of Exception Handling.
7. Write java programs using concept of Multithreading.
8. Write a java program using concept of Networking.
9. Write java programs using concept of Applets.
10. Write java programs using concept of AWT & Event Handling.
11. Write java programs using concept of JDBC.
12. Write java programs using concept of swings.

SECOND SEMESTER

MSIT4201 Design And Analysis Of Algorithms (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4201	Design & Analysis of Algorithms	4	3 + 1 + 0

MODULE-I

(16 Lectures)

Introduction to design and analysis of algorithms, Growth of Functions (Asymptotic notations, standard notations and common functions), Recurrences, solution of recurrences by substitution, recursion tree and Master methods, worst case analysis of Merge sort, Quick sort and Binary search, Design & Analysis of Divide and conquer algorithms.

MODULE-II

(18 Lectures)

Heapsort : Heaps, Building a heap, The heapsort algorithm, Priority Queue, Lower bounds for sorting. Dynamic programming algorithms (Matrix-chain multiplication, Elements of dynamic programming, Longest common subsequence) Greedy Algorithms - (Assembly-line scheduling, Activity- selection Problem, Elements of Greedy strategy, Fractional knapsack problem, Huffman codes).

MODULE-III

(16 Lectures)

Data structure for disjoint sets:- Disjoint set operations, Linked list representation, Disjoint set forests. Graph Algorithms: Breadth first and depth-first search, Minimum Spanning Trees, Kruskal and Prim's algorithms, single- source shortest paths (Bellman-ford and Dijkstra's algorithms), All-pairs shortest paths (Floyd – Warshall Algorithm). Back tracking, Branch and Bound. String matching (Rabin-Karp algorithm), NP - Completeness (Polynomial time, Polynomial time verification, NP - Completeness and reducibility, NPComplete problems (without Proofs), Approximation algorithms (Vertex-Cover Problem, Traveling Salesman Problem).

Text Book:

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest, C.Stein : Introduction to algorithms -2nd edition, PHI,2002. Chapters: 1,2,3,4 (excluding 4.4), 6, 7, (7.4.1), 8 (8.1) 15 (15.1 to 15.4), 16 (16.1, 16.2, 16.3), 21 (21.1,21.2,21.3), 22(22.2,22.3), 23, 24(24.1,24.2,24.3), 25 (25.2), 30,32 (32.1, 32.2) 34, 35(35.1, 35.2) 2. AnanyLevitin ,Introduction to the Design and Analysis of Algorithm –Second Edition ,Pearson Education.

Reference Books:

1. Algorithms – Berman, Cengage Learning
2. Computer Algorithms: Introduction to Design & Analysis, 3rd edition-by Sara Baase,
3. Allen Van Gelder, Pearson Education
4. Fundamentals of Algorithm-by Horowitz &Sahani, 2nd Edition, Universities Press.
4. Algorithms By Sanjay Dasgupta, UmeshVazirani – McGraw-Hill Education
5. Algorithm Design – Goodrich, Tamassia, Wiley India

MSIT4202 Database Management System (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4202	Database Management System	4	3 + 1 + 0

MODULE-I:

(16 Lectures)

Introduction to database Systems; Basic concepts & Definitions; Data Dictionary, DBA, File oriented system vs. Database System, Database Language. Database System Architecture-Schemas, Sub Schemas & Instances, 3-level database architecture, Data Abstraction, Data Independence, Mappings, Structure, Components & functions of DBMS, Data models, Mapping E-R model to Relational, Network and Object Oriented Data models, types of Database systems.

MODULE-II:

(16 Lectures)

Relational Algebra, Tuple & Domain Relational Calculus, Relational Query Languages: SQL and QBE. Database Design:-Database development life cycle (DDLC), automated design tools, Functional dependency and Decomposition, Dependency Preservation & lossless Design, Normalization, Normal forms: 1NF, 2NF, 3NF, and BCNF, Multi-valued Dependencies, 4NF & 5NF. Query processing and optimization: Evaluation of Relational Algebra Expressions, Query optimization.

MODULE-III:

(18

Lectures)

Transaction processing and concurrency control: Transaction concepts, concurrency control, locking and Timestamp methods for concurrency control. Database Recovery System: Types of Data Base failure & Database Recovery, Recovery techniques. Advanced topics: Object-Oriented & Object – Relational Database, Parallel & Distributed Database. Introduction to Data warehousing & Data Mining.

Text Books:

10. Database Systems by Thomas Connolly and Carolyn Begg-Pearson Education-3rd , edition

Reference Books:

11. An introduction to Database System – Bipin Desai, Galgotia Publications
2. Database System: concept, Design & Application by S.K.Singh (Pearson Education)
12. Database management system by leon&leon (Vikas publishing House).
13. Database Modeling and Design: Logical Design by Toby J. Teorey, Sam S. Lightstone, and Tom Nadeau, “”, 4th Edition, 2005, Elsevier India Publications, New Delhi
14. Fundamentals of Database Management System – Gillenson, Wiley India
6. Database System Concepts by Sudarshan, Korth (McGraw-Hill Education)

MSIT4203 Data Communication And Computer Networks (3-1-0)

Code	Course Title	Credits	L + T + P
MSIT4203	Data Communication and Computer Networks	4	3 + 1 + 0

Introduction to Computer Networks: Introduction, Evolution of Computer Networks, Components

MODULE-I:

(16 Lectures)

of Computer Networks, Network Topologies, Types of Computer Network

Data Communications: Introduction, Data Communication System, Network Connections, Communication Media.

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media, Transmission Modes, Data Communication Interfacing, and Multiplexing.

Data Link Layer - Error Detection and Error Correction, Function of Data Link Control, Protocols and Standards, High Level Data Link Control design issues, sliding window protocol.

Multi Access Protocols - ALOHA, CSMA, CSMA/CD Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, repeaters, hubs, bridges, switches, routers and gateways.

MODULE-II

(16 Lectures)

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms. Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol, The Internet Transport Protocols UDP-RPC, Internet Transport Protocols- Introduction to TCP, The TCP Service

Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

MODULE-III

(16 Lectures)

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH Internet Applications and Network Security: Introduction, World Wide Web, Email. **Text Books:**

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

References Books:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.
4. Computer Networks, L. L. Peterson and B. S. Davie, 4th edition, ELSEVIER.
5. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

MSIT4204 Design And Analysis Of Algorithms Laboratory (0-0-3)

Code	Course Title	Credits	L + T + P
MSIT4204	Design & Analysis of Algorithms Lab	2	0 + 0 + 3

1. Using a stack of characters, convert an infix string to postfix string.
2. Implement insertion, deletion, searching of a BST.
3. Implement binary search and linear search in a program
4. Implement a heap sort using a max heap.
5. Implement DFS/ BFS for a connected graph.
6. Implement Dijkstra's shortest path algorithm using BFS.
7. Write a program to implement Huffman's algorithm.
8. Implement MST using Kruskal/Prim algorithm.
9. Implement the following algorithms.
 - a. Write a program on Quick sort algorithm.
 - b. Write a program on merge sort algorithm.
 - c. Take different input instances for both the algorithm and show the running time.
10. Implement Strassen's matrix multiplication algorithm.
11. Write down a program to find out a solution for 0 / 1 Knapsack problem.
12. Using dynamic programming implement LCS.

MSIL4201 Database Management System Lab (0-0-3)

Code	Course Title	Credits	L + T + P
MSIL4201	Database Management System Lab	2	0 + 0 + 3

1. Preparing an ER diagram for given database and Conversion from ER diagram to tables.
2. Perform DDL (Data Definition Language) commands.
3. Perform DML statement.
4. Implement Data Constraints
5. Implement Subquery.
6. Implement queries using set operations.
7. Implement PL/SQL Block.
8. Implement Cursors

9. Implement Procedures
10. Implement Function
11. Implement Trigger
12. Database Design and implementation – Employee database

MSIL4202 Data Communication And Computer Networks Lab (0-0-3)

Code	Course Title	Credits	L + T + P
MSIL4202	Data Communication & Computer Networks Lab	2	0 + 0 + 3

Some Network protocol simulation using NS2 / Net Sim / CISCO Packet Tracer.

1. Installation of NS2 / Net Sim / CISCO Packet Tracer.
2. Analyzing number of transmitting nodes vs. collision count, mean delay for Ethernet LAN.
3. Analyzing bus vs. star-switch with respect to number of collisions (for a fixed number of transmitting nodes) for Ethernet LAN
4. Analyzing performance of token ring with number of nodes vs. response time, mean delay using NetSim.
5. Comparing the throughput and normalized throughput for token ring and token bus for different transmitting nodes.

6. Comparing the CSMA/CD vs. CSMA/CA protocols (for a fixed number of transmitting nodes).
7. Analyzing the difference between unicast and broadcast transmission (for a fixed number of transmitting nodes).
8. Verification of stop-and-wait protocol.
9. Verification of Go-back-N protocol.
10. Verification of Selective repeat protocol.
11. Verification of distance vector routing algorithm.
12. Verification of link state routing algorithm.

Skill Subjects
Detail Syllabus
MSIS4781 Web Programming (3-1-0)

Code	Course Title	Credits	L + T + P
MSIS4781	Web Programming	4	3 + 1 + 0

Module – I

(16 Lectures)

HTML: Overview of Internet and HTML, Basic Tags, Elements, Attributes, Formatting, Phrase Tags, Meta Tags, Comments, Images, Tables, Lists, Text Links, Image Links, Email Links, Frames, Iframes, Blocks, Backgrounds, Colors, Fonts, Forms, Embed Multimedia, Marquees, Header, Style Sheet, JavaScript, Layouts

Bootstrap: Introduction, Environment Setup, Grid System, CSS Overview, Typography, Code, Tables, Forms, Buttons, Images, Helper Classes, Responsive utilities, Glyphicons, Drop downs, Button Groups, Button Drop downs, Input Groups, Navigation Elements, Navbar, Breadcrumb, Pagination, Labels, Badges, Jumbotron, Page Header, Thumbnails, Alerts, Progress Bars, Media Object, List Group, Panels, Wells, Bootstrap Plugins

Module – II

(16 Lectures)

PHP: Introduction, Environment, Syntax Overview, Variable Types, Constants, Operator Types, Decision Making, Loop Types, Arrays, Strings, Web Concepts, GET & POST, File Inclusion, Files & I/O, Functions, Cookies, Sessions, Sending Emails, File Uploading. Coding Standard

MySQL: Introduction, Installation, Administration, Syntax, Connection, Create Database, Drop Database, Select Database, Data Types, Create Tables, Drop Tables, Insert Query, Select Query, Where Clause, Update Query, Delete Query, Like Clause, Sorting Results, Using Join, NULL Values, Regexp, Transactions, Alter Command, Indexes, Temporary Tables, Clone Tables, Database Info, Using Sequences, Handling Duplicates, SQL Injection, Database Export, Database Import

Module – III

(16 Lectures)

PHP & MySQL Connection: Connecting to MySQL database, Create MySQL Database Using PHP, Delete MySQL Database Using PHP, Insert Data to MySQL Database, Retrieving Data from MySQL Database, Using Paging through PHP, Updating Data into MySQL Database, Deleting Data from MySQL Database, Using PHP to Backup MySQL Database

CMS using Joomla: Introduction to CMS, Purpose, Pitfalls and Misconceptions, Examples: Joomla, Drupal, WordPress and Joomla Configuration

Text Book:

1. Web Warrior Guide to Web Design Technologies, Don Gosselin, Joel Sklar & others, Cengage Learning
2. Beginning PHP And MySQL From Novice To Professional; SKU: BK9788184897456; ISBN-13: #9788184897456; ISBN: 8184897456; Author: W. Jason Gilmore; Publisher: Om Books

Reference Books:

1. PHP and MySQL in Easy Steps by Mike Mcgrath Publisher: Tata Mcgraw Hill
2. PHP: The Complete Reference by Steven Holzner Publisher: Tata Mcgraw Hill
3. MySQL: The Complete Reference by Author: VikramVaswani Publisher: Tata Mcgraw Hill

MSIS4782 Business Intelligence And Its Application (3-1-0)

Code	Course Title	Credits	L + T + P
MSIS4782	Business Intelligence & Its Applications	4	3 + 1 + 0

Module-I:

(16 Lectures)

Introduction to Business Intelligence: Introduction to OLTP and OLAP, BI Definitions & Concepts, Business Applications of BI, BI Framework, Role of Data Warehousing in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities

Module-II:

(16 Lectures)

Basics of Data Integration (Extraction Transformation Loading): Concepts of data integration need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL using SSIS, Introduction to data quality, data profiling concepts and applications

Module-III:

(16 Lectures)

Introduction to Multi-Dimensional Data Modelling: Introduction to data and dimension modelling, multidimensional data model, ER Modelling vs. multi-dimensional modelling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using SSAS Basics of Enterprise Reporting, Duration Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to SSRS Architecture, enterprise reporting using SSRS

Courseware:

The courseware including PowerPoint and notes will be made available by Infosys for the Elective.

Reference books:

1. Business Intelligence by David Loshin
2. Business intelligence for the enterprise by Mike Biere
3. Business intelligence roadmap by Larissa Terpeluk Moss, ShakuAtre
4. Successful Business Intelligence: Secrets to making Killer BI Applications by CindiHowson
5. Delivering business intelligence with Microsoft SQL server 2008 by Brain, Larson
6. Foundations of SQL Server 2005 Business Intelligence by Lynn Langit
7. Information dashboard design by Stephen Few

MSIS4783 CISCO Computer Networking Fundamentals (1-0-3)

Code	Course Title	Credits	L + T + P
MSIS4783	CISCO Computer Networking	4	1 + 0 + 3

Module-I

(16 Lectures)

Networking basics -Introduction to computer network? ,OSI & TCP/IP models ,Ethernet Networking and Data Encapsulation, Ethernet frame ,MAC & IP addresses ,Unicast, multicast, and broadcast addresses ,Network devices ,Half duplex and full duplex ,IEEE Ethernet standards ,Cisco three-layer hierarchical model ,Cabling -

Types of Ethernet cabling ,Types of Ethernet cables

Types of networks -Wide area network, Local area network & Metropolitan area network
IP addressing -Types of IP addresses, Classes of IP addresses, Subnetting,Subnet mask
Create subnets, Network tools -Ping, Traceroute, Network protocols -TCP/IP protocols suite

Module-II

(16 Lectures)

Cisco Routers/Switches-Introduction to Cisco Routers, Switches,Command-Line Interface (CLI),Basic Configuration of Router and Switches,Configuring Router Interfaces,DNS, DHCP,Cisco's Internetworking Operating System (IOS)

Module-III

(16 Lectures)

IP routing - static & dynamic routing,Routing protocols: Distance vector (RIP, EIGRP),Link state (OSPF),Lan switching ,Differences between hubs and switches

VLAN -Configuring VLANs ,ACL-Types of access lists,Configuring ACLs,Network Address Translation (NAT)-Static NAT ,Dynamic NAT,Ipv6 Internet Protocol Version 6 (IPv6) -Ipv6 address format ,Types of IPv6 addresses ,Configure IPv6 ,Differences between IPv4 and IPv6

Text-books :

1 Computer networks Book by Andrew S. Tanenbaum

2 CCNA Cisco Certified Network Associate Study Guide, 7th Edition Book by Todd Lammle.

MSIS4784 Dot Net Using C# (1-0-3)

Code	Course Title	Credits	L + T + P
MSIS4784	Dot Net Using C #	4	1 + 0 + 3

Module-I: Dot Net Overview

(16 Lectures)

Introduction, Vision and goals of .NET, overview of .Net applications, The .Net Framework Architecture, Intermediate Language(IL), Common Language Runtime (CLR), Base Class Library, JIT Compilation, Common Type System (CTS), Common Language System (CLS), Assemblies, IL Disassembler (ILDasm.exe), Namespaces. Visual Studio IDE, Introduction: OOPS, Variables, Operators, Decision Making, Arrays, Recursion, **C# classes** Constants, fields, methods, properties, events, indexers, operators, constructors, destructors, and static modifiers, delegate, Type Casting, Structures, Class Inheritance Compiling with multiple classes, virtual and override methods, operator overloading

Module-II: Object Oriented Programming and C#

(16 Lectures) abstract methods, Interfaces & Abstract Classes, Garbage Collection, sealed classes, Boxing and Unboxing,

Working with namespaces, Exception handling, Collections, Multithreading, Understanding **Windows**

Forms Architecture, Windows controls: Common, Containers, Menus and Tool strips,. Understanding

ADO.NET: Architecture and framework. Understanding the Dataset classes and their relatives,

Understanding OLEDB and SQL Server Support. Understanding common database operations using ADO.NET

Module-III: Windows form with C#

(16 Lectures)

Introduction to ASP.NET, ASP.NET lifecycle, web application architecture, Code behind model, Creating web applications with web forms [Asp.NET] Difference between ASP and ASP.Net. ASP.NET server controls: Introduction, How to work with button controls, Textboxes, Labels, checkboxes and radio buttons, list controls and other web server controls, web.config and global.asax files. Validation Control, State Management: Using view state, using session state, using application state, using cookies and URL encoding. Master Pages

Text Book:

1. C# 5.0 in a Nutshell: The Definitive Reference by Joseph Albahari and Ben Albahari
2. [Professional ASP.NET 3.5: In C# and VB](#) by Bill Evjen, Scott Hanselman, Devin Rade

Reference Book:

1. NET 4.0 programming (6 in 1) Black Book. Publication DreemTech Press
2. ADO.NET Examples and Best Practices for C# Programmers By Peter D. Blackburn, William (Bill) Vaughn

MSIS4785 Project Based C – Programming (1-0-3)

Code	Course Title	Credits	L + T + P
MSIS4785	Project Based C – Programming	4	1 + 0 + 3

Course Objective: To enable the students to be confident programmers, so software development capability is not a bottleneck and when they do other computer science courses.

Pre-requisite: Nil

Scope and Syllabus: Programming in C

Teaching Methodology:

The teaching methodology will take into account the varying confidence level and capability of students in programming. The course will be run in project mode, thus:

1. At the beginning of the semester, 50 programming projects will be announced. These 50 projects will be categorized thus:

a. Simple: 25 programs: The simple programs will each be of simple functionality, each illustrating one or two simple attributes of C programming. The range of the 25 programs will be such that all aspects of C will be understood when one does all 25. String manipulation, Simple numerical problems, Reading and manipulating data into arrays of structures, Using pointers, will be some of the programs in Simple.

b. Meaningful: 17 programs: These programs are of medium complexity, and each will achieve something meaningful. Sorting student records, matrix multiplication, or finding a word in a dictionary, is examples of Meaningful programs

c. Complex: 8 programs. These are “difficult” problems, and the output can be useful in some ways to build other programs. Each program will ensure thinking up a good algorithm.

2. Students who are not confident will begin with Simple programs. But confident students will be encouraged straightaway to jump to Meaningful.

3. Lectures will focus on common problems of students. Tutorials will be focused on doubt clearing. It is not mandatory to attend lectures and tutorials if one has graduated to Meaningful programs, or if one has got O grade (the highest grade) in the C in Use course.

4. Evaluation: One gets 1 point for completing one simple program, 5 for completing a Meaningful program, and 15 for completing a Complex program. Points get added at the end of the course. Minimum 40 points are needed to pass. Minimum two complex programs must be delivered to qualify for the highest grade.

5. All students will be advised that they need to complete all 50 programs (on their own) before they move into 3rd Year. Faculty guidance will be provided for this.

6. The programs at Meaningful and Complex level will change from time to time to ensure students write original programs.

7. Viva Voce on each assignment is necessary to ensure students’ performance.

THIRD SEMESTER

MSCI2301 Advanced Theory of Computation (3-1-0)

Code	Course Title	Credits	L + T + P
MSCI2301	Advanced Theory of Computation	4	3 + 1 + 0

Module-I

1. Languages (8 Lectures)

Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar

2. Finite Automata and Regular Languages (20 Lectures)

Regular Expressions, Transition Graphs, Deterministics and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.

Module-II

3. Context free languages (17 Lectures)

Context free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.

Module-III

4. Turing Macines and Models of Computations (15 Lectures)

RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages, unsolvability problems.

Recommended Books:

Daniel I.A.Cohen, Introduction to computer theory, John Wiley,1996

Lewis & Papadimitriou, Elements of the theory of computation , PHI 1997.

Hoperoft, Aho, Ullman, Introduction to Automata theory, Language & Computation –3rd Edition, Pearson Education. 2006

P. Linz, An Introduction to Formal Language and Automata 4th edition Publication Jones Bartlett, 2006

MSCI2302 Advanced Cryptography & Network Security (3-1-0)

Code	Course Title	Credits	L + T + P
MSCI2302	Advanced Cryptography & Network Security	4	3 + 1 + 0

Module-I

(10 Lectures)

Introduction to Cryptography: Basics of Symmetric Key Cryptography, Basics of Assymmetric Key Cryptography, Hardness of Functions.

Notions of Semantic Security (SS) and Message Indistinguishability (MI): Proof of Equivalence of SS and MI, Hard Core Predicate, Trap-door permutation, Goldwasser-Micali Encryption. Goldreich-Levin Theorem: Relation between Hardcore Predicates and Trap-door permutations

Module-II

(15 Lectures)

Formal Notions of Attacks: Attacks under Message Indistinguishability: Chosen Plaintext Attack (INDCPA), Chosen Ciphertext Attacks (IND-CCA1 and INDCCA2), Attacks under Message Nonmalleability: NM-CPA and NM-CCA2, Interrelations among the attack model

Random Oracles: Provable Security and asymmetric cryptography, hash functions One-way functions: Weak and Strong one way functions

Pseudo-random Generators (PRG): Blum-Micali-Yao Construction, Construction of more powerful PRG, Relation between One-way functions and PRG, Pseudorandom Functions (PRF)

Building a Pseudorandom Permutation: The Luby Rack off Construction: Formal

Definition, Application of the Luby Rack off Construction to the construction of Block Ciphers, The DES in the light of Luby Rack off Construction

Left or Right Security (LOR)

Module-III

(15 Lectures)

Message Authentication Codes (MACs): Formal Definition of Weak and Strong MACs, Using a PRF as a MAC, Variable length MAC

Public Key Signature Schemes: Formal Definitions, Signing and Verification, Formal Proofs of Security of Full Domain Hashing

Assumptions for Public Key Signature Schemes: One way functions Imply Secure One-time Signatures Shamir's Secret Sharing Scheme

Formally Analyzing Cryptographic Protocols Zero Knowledge Proofs and Protocols

References:

1. Hans Delfs and Helmut Knebl, Introduction to Cryptography: Principles and Applications, Springer Verlag.
2. Wenbo Mao, Modern Cryptography, Theory & Practice, Pearson Edu. (Low Priced Ed.)
3. Shaffi Goldwasser and Mihir Bellare, Lecture Notes on Cryptography, Available at <http://citeseerx.ist.psu.edu/>.

MSCI2303 Advanced Operating Systems (3-1-0)

Code	Course Title	Credits	L + T + P
MSCI2303	Advanced Operating Systems	4	3 + 1 + 0

Module-I

(16 Lectures)

1 .Introduction

Basic OS functions, resource abstraction, types of operating systems–multiprogramming systems, batch systems , time sharing systems; operating systems for personal computers & workstations, process control & real time systems.

2.Operating System Organization

Processor and user modes, kernels, system calls and system programs.

Module-II

(16 Lectures)

3 .Process Management

System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries; Process Scheduling, non-pre-emptive and pre-emptive scheduling algorithms; concurrent and processes, critical section, semaphores, methods for inter-process communication; deadlocks.

4.Memory Management

Physical and virtual address space; memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory

Module-III

(16 Lectures)

5.File and I/O Management

Directory structure, file operations, file allocation methods, device management.

6 .Protection and Security

Policy mechanism, Authentication, Internal access Authorization.

Recommended Books:

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

MSIL2301 Operating Systems Lab (0-0-3)

Code	Course Title	Credits	L + T + P
MSIL2301	Operating Systems Lab	4	0 + 0 + 3

1. WRITE A PROGRAM (using *fork()* and/or *exec()* commands) where parent and child execute: a) same program, same code.
b) same program, different code.
c) before terminating, the parent waits for the child to finish its task.
2. WRITE A PROGRAM to report behaviour of Linux kernel including kernel version, CPU type and model. (CPU information)
3. WRITE A PROGRAM to report behaviour of Linux kernel including information on configured memory, amount of free and used memory. (memory information)
4. WRITE A PROGRAM to print file details including owner access permissions, file access time, where file name is given as argument.
5. WRITE A PROGRAM to copy files using system calls.
6. Write program to implement FCFS scheduling algorithm.
7. Write program to implement Round Robin scheduling algorithm.
8. Write program to implement SJF scheduling algorithm.
9. Write program to implement non-preemptive priority based scheduling algorithm.
10. Write program to implement preemptive priority based scheduling algorithm.
11. Write program to implement SRJF scheduling algorithm.
12. Write program to calculate sum of n numbers using *thread* library.
13. Write a program to implement first-fit, best-fit and worst-fit allocation strategies.

MSIE2404 Cloud Computing Techniques (3-1-0)

Code	Course Title	Credits	L+T+P
MSIE2404	Cloud Computing Techniques	4	3+1+0

Introduction to Cloud Computing:

Cloud Computing in a Nutshell, Roots of Cloud Computing

Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks.

Enriching the 'Integration as a Service' Paradigm for the Cloud Era: The Evolution of SaaS, The Challenges of SaaS Paradigm, Approaching the SaaS Integration Enigma, The Integration Methodologies, SaaS Integration Products and Platforms, SaaS Integration Services, A Framework of Sensor—Cloud Integration.

INFRASTRUCTURE AS A SERVICE (IAAS):

Virtual Machines Provisioning and Migration Services, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context, Secure Distributed Data Storage in Cloud Computing: Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing, Open Questions and Challenges.

PLATFORM AND SOFTWARE AS A SERVICE: Technologies and Tools for Cloud Computing, Hybrid Cloud Implementation, Visionary thoughts for Practitioners, CometCloud Architecture, Overview of CometCloud-based Applications, Autonomic Behavior of CometCloud.

Workflow Engine for Clouds:

Workflow Management Systems and Clouds, Architecture of Workflow Management Systems, Utilizing Clouds for Workflow Execution, A Classification of Scientific Applications and Services in the Cloud, SAGA-based Scientific Applications that Utilize Clouds, MapReduce Programming Model, Major MapReduce Implementations for the Cloud, MapReduce Impacts and Research Directions.

Best Practices in Architecting Cloud Applications in the AWS Cloud: Cloud Concepts, Cloud Best Practices, GrepTheWeb Case Study, Future Research Directions.

Text Books:

1. CLOUD COMPUTING Principles and Paradigms by Rajkumar Buyya, James Broberg, Andrzej Goscinski.

FOURTH SEMESTER

MSCI2401 Quantitative Techniques (3-1-0)

Code	Course Title	Credits	L + T + P
MSCI2401	Quantitative Techniques	4	3 + 1 + 0

Module-I

(16 Lectures)

1. **Quantitative Techniques - An Introduction** — Classifications of quantitative techniques; applications of quantitative techniques to business and industry; limitations of quantitative techniques.

Module-II

(16 Lectures)

2. **Statistical Techniques** —
 - i. Descriptive statistics - functions, scope, distrust and limitations of statistics.
 - ii. Statistical data collection - primary and secondary data, methods of collecting primary data, sources of secondary data, census and sample investigation.
 - iii. Presentation of statistical data - classification; tabulation; frequency distribution; diagrams and graphs.
 - iv. Statistical averages - importance and requisites of a good statistical average; types of averages - arithmetic mean, median, mode, geometric mean and harmonic mean, weighted average; relationship amongst different averages.
 - v. Dispersion - meaning and significance of dispersion; methods of measuring dispersion - range, quartile; mean deviation, standard deviation, Lorenz Curve.
 - vi. Correlation and regression analysis (simple) - meaning and significance of correlation, types of correlation, methods of studying correlation - scattered diagram, Karl Pearson's coefficient of correlation; rank correlation; co-efficient of determination; regression analysis - meaning and significance, difference between correlation and regression, regression lines, regression equations, coefficient of regression; standard error of the estimate.
 - vii. Index numbers - definition and significance of index numbers, construction of index numbers, types of index numbers, consumer price index numbers, limitations of index numbers.
 - viii. Time series analysis - meaning, significance and components of time series, measurement of trend-graphic, semi-average, moving average and least square method, measurement of seasonal variations; forecasting.

Module-III

(16 Lectures)

3. **Linear Programming Technique - Basics** — Meaning, advantages, limitations and business applications of linear programming; basic terminology; formulation of linear programming problem; graphic solution of linear programming problem.

Reference Books

□ **Tata Mc Graw Hill Company**

1. Theory and problems of statistics

- Murray R Spiegel & Larry J Stephens
2. Quantitative Techniques in Management
- vohra

MSCI2402 Object Oriented Software Engineering (3-1-0)

Code	Course Title	Credits	L + T + P
MSCI2402	Object Oriented Software Engineering	4	3 + 1 + 0

UNIT-1

(10 Lectures)

Real world domains, object oriented approach and technology, objects instances and concepts, Objects and classes of objects, generalized object oriented software, Development cycle, Object oriented programming language, object-oriented analysis of a real world domain object model. The notation of encapsulation and information hiding, object identity: entity and attributes, data and knowledge: The notion of inheritance, Relationship between objects: Association, Generalization/ Specialization, Aggregation, Object and States, Dynamic behavior of objects.

UNIT-II

(18 Lectures)

Object-Oriented analysis: introduction, Techniques for information gathering for RA, use case driven object oriented analysis, concepts and principles, identifying the elements of an object model, Management of ObjectOriented Software projects, Object oriented analysis, domain analysis and generic components of object-oriented analysis model, object behavior model.

The intent of object-oriented metrics, the distinguishing characteristics and metrics for the object-oriented design model, class oriented metrics, operation oriented metrics, metrics for object oriented testing, metrics for object-oriented projects.

Introduction to UML : The meaning of object-orientation, object identity, encapsulation, information hiding, polymorphism, genericity, importance of modeling, principles of modeling, object oriented modeling, conceptual modeling of the UML, Architecture.

Basic structural modeling : classes, relationships, common mechanisms, diagrams, advanced structural modeling : advanced relationship interfaces, roles, packages, instances.

UNIT-III

(12 Lectures)

Class & object diagrams: Terms, concepts, examples, modeling techniques, class & object diagrams.

Collaboration Diagrams: Terms, Concepts, depicting a message, polymorphism in collaboration diagrams,

iterated messages, use of self in messages. Sequence diagrams: Terms, concepts, differences between collaboration and sequence diagrams, depicting synchronous messages with/without priority call back mechanism broadcast message.

Behavioral modeling: interactions, use cases, use case diagrams, activity diagrams. Advanced Behavioral modeling:

Events and signals, state machines, process and threads, time and space, state chart diagram. Architectural

Modeling: Terms, concepts, examples, modeling techniques for component diagrams and deployment diagram

Suggested Reading:

1. Grady Boach, James Rambaugh, Ivar Jacobson : The unified modeling language user guide, Addison wesey.
2. Mieiar Page-jones : fundamentals of object oriented design in UML, Addison Wesley, 2000

MSIL2401 Object Oriented Software Engineering Lab (0-0-3)

Code	Course Title	Credits	L + T + P

MSIL2401	Object Oriented Software Engineering Lab	4	3 + 1 + 0
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Experiment 1: Develop requirements specification for a given problem (The requirements specification should include both functional and non-functional requirements).

For a set of about 20 sample problems, see the questions section of Chap 6 of Software Engineering book of Rajib Mall)

Experiment 2: Develop DFD Model (Level 0, Level 1 DFD and data dictionary) of the sample problem (Use of a CASE tool required)

Experiment 3: Develop Structured design for the DFD model developed

Experiment 4: Develop UML Use case model for a problem

(Use of a CASE tool any of Rational rose, Argo UML, or Visual Paradigm etc. is required)

Experiment 5: Develop Sequence Diagrams

Experiment 6: Develop Class diagrams

Experiment 7: Develop code for the developed class model using Java

Experiment 8: Use testing tool such as Junit

Experiment 9: Use a configuration management tool

Experiment 10: Use any one project management tool such as Microsoft Project or Gantt Project, etc

