# SEMESTER-I

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

# Indus University
## Institute of Information and Communication Technology

Integrated Master of Science (CA & IT)

### Teaching Scheme

| Subject Code | Subject Name | | Teaching Learning | | | |
|---|---|---|---|---|---|---|
| | | Theory Session (Hours) | Tutorial Session (Hours) | Laboratory Session (Hours) | Total (Hours) | Credit |
| IMSC0101 | Fundamentals of Programming | 4 | 0 | 4 | 8 | 6 |
| IMSC0102 | Fundamentals of Computer Organization | 4 | 0 | 0 | 4 | 4 |
| IMSC0103 | Mathematical Concepts | 4 | 2 | 0 | 6 | 5 |
| IMSC0104 | Database management System Concepts | 4 | 0 | 4 | 8 | 6 |
| IMSC0105 | Communication and Presentation Skills | 3 | 2 | 0 | 5 | 4 |
| **Total** | | **19** | **4** | **8** | **31** | **25** |

Subject: **Fundamentals of Programming**

| Program: **Integrated MSc (CA & IT)** | | | Subject Code: **IMSC0101** | | | | Semester: **I** | |
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| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT I:** **[12]**

Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software. Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single-user & multi-user operating system.: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies.

**UNIT II:** **[12]**

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Techniques of Problem Solving: Flowcharting, algorithms, pseudo code, decision table, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.Computer Languages: Analogy with natural language, machine language, assembly language, high-level language, compiler, interpreter, assembler, characteristics of a good programming language.

**UNIT III:** **[12]**

Overview of C Language,C Fundamental : Introduction to C, character set, identifiers, keywords, data types, constants, variable, user defined data types, arithmetic, unary, relational, logical, assignment and conditional operators & expression. Basic structure of a C program. Data I/O statement : single character I/O, formatted I/O, string I/O functions. Control StructureControl Statement : sequencing, alteration (if-else, switch, break, continue, go to, iteration while, do-while, for) and nested loops.

**UNIT IV:** **[12]**

Arrays: Linear array, Representation of Linear array in memory, Traversing Linear array, Insertion and deletion in an array, Multi-dimensional array : Row-Major, Column Major order, space array.Searching, Sorting, and Merging: Linear & Binary Searching, Bubble, Selection, and Insertion Sorting, Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime. introduction to Strings

**Text Books**

1. Sinha, P.K. &Sinha, Priti, "*Computer Fundamentals*", BPB
2. Dromey, R.G., "*How to Solve it By Computer*", PHI
3. Balagurusamy E, "*Computing Fundamentals and C Programming*", Tata McGraw Hill.

**Reference Books**

1. Norton, Peter, "*Introduction to Computer"*, McGraw-Hill
2. Leon, Alexis &Leon, Mathews, "*Introduction to Computers*", Leon Tech World
3. Rajaraman, V., "*Fundamentals of Computers*", PHI
4. Ram, B., "*Computer Fundamentals, Architecture & Organization*", New Age International (P) Ltd.

**Practical Lab**

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| **Week 1** | Understanding basic computer system & peripherals Input & Output Devices, their types and specifications, CPU, Memory devices- types primary and secondary.MOTHER BOARD: Study of Motherboard RAM, ROM, CMOS, POST, BUS, (Address, Data, SYSTEM) Connections of various devices such as Display Adapter, Ports ( Serial, Parallel, USB) |
| **Week 2** | Understanding Excel Concepts :Exercise on basics of excel workbook.Exercise on calculations, formatting and creating charts and lists in a workbook or spreadsheet. |

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| **Week 3** | Exercise on how to use macros and other advanced skills like date formats, conditional formatting. |
| **Week 4** | Anti Virus: What is antivirus? Different antiviruses available in market?Loading the antivirus on the system?Scanning a drive or folder?Getting updates of antivirus? Difference between blocking a process, quarantine a file, removing files?Apply the above and find out the difference on the system |
| **Week 5** | **Compression tools and Disk Management tools (Disk Cleanup, Backup)**<br>What is compression of file?<br>What are the tools available for compression of data and files on the storage?<br>Perform compression operation on the system and find out the results of compression?<br>**Disk management**<br>(A) What is disk management?<br>(B) What is defragmentation of disk, formatting of disk, partitioning.<br>(C) How to assign user rights to a partition<br>(D) Find out the disk management tools with your OS (Windows XP), and any other tools available for disk management?<br>(E) Perform disk cleanup with CCleaner tool and taking backup of our data on the system?<br>Find out why these operations are done on the system and the results of performing these operations? |
| **Week 6** | (A) LAN and group of LAN which form internet.<br>**(B) Protocols**<br>(C) IP v4 configuration in Windows.<br>(D) HTTP, HTTPS<br>(E) FTP<br>(F) WWW, web browsers (Installation, configuration, and add-ons management). |

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| | (G) Create E-mail account, sending e-mail with attachments, filtering mails, how to use institute mail account.<br>(H) Uploading and downloading files.<br>(I) Search Information<br>(J) Google advance search options,<br>**(K)** Exploring Google scholar service. |
| **Week 7** | **Using input and output statements, Operators**<br>• Write a program to print the address of INUDS.<br>• Write a program to perform basic arithmetic operators on given two numbers.<br>• Find the area and perimeter of square and rectangle and circle. Input the side(s) through the keyboard. (use PIE as symbolic constant)<br>• Write a program to swap values of 2 variables (i) with extra variable and (ii) without using an extra variable. |
| **Week 8** | • Write a program to print the ASCII value of a given character.<br>• Write a program to enter the integer number and convert it into Rs and Paisa.<br>• Write a program to enter two numbers. Make the comparison between them with conditional operator. If the first number is greater than second perform multiplication otherwise division operation.<br>• Write a program to enter the temperature in Fahrenheit and convert it to Celsius.[C = ((F-32)*5)/9]<br>• Write a program to enter a number and multiply it by 4 without using "*" operator. |
| **Week 9** | • Write a program to find the maximum of two integer values.<br>• Write a program to check whether the given character is a vowel of not.<br>• Write a program to get 3 sides of triangle and check whether triangle can be drawn or not. Also check whether it is equilateral, isosceles or scalene triangle. (using else if ladder) |

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| | • Write a program to print number of days in a given month using switch statement. The program requires month number (between 1 to 12) as an input and then displays number of days in that month.<br>• Write a program to calculate total salary of an employee.<br>• total salary = basic + da + hra + ta. da = 50% of basic.<br>Basic hra ta<br><6000 400 100<br>6001>= &<10000 1400 300<br>>=10000 2400 700 |
| **Week 10** | • Write a program to print 1 to 10 numbers using<br>i) Go to statement<br>ii) For statement<br>• Write a program to display the largest of 5 numbers using while statement and ternary operator.<br>• Write a program to print Fibonacci series of given number.<br>• Write a program to find factorial of a number.<br>• Write a program to check whether a number is a Krishnamurthy number or not. Krishnamurthy number is one whose sum of factorial of digits equals the number. Example: 145 ---- 1! + 4! + 5! = 1 + 24 + 120 = 145 |
| **Week 11** | • Write a program to check whether the number is Armstrong or not.<br>• Example:153----1 + 5 +3 = 1 + 125 + 27 153<br>• Write a program to count number of positive and negative numbers from the given numbers. The user enters 999 to terminate OR maximum 100 numbers are taken. (use break and continue statement)<br>• Write a program to list all prime numbers within given range.<br>• Write a program to draw following patterns: |

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| | Write a program to draw following patterns:<br>`*` `1` `5 4 3 2 1` `A`<br>`**` `a b` `4 3 2 1` `A B`<br>`***` `1 2 3` `3 2 1` `A B C`<br>`****` `a b c d` `2 1` `A B C D`<br>`*****` `1 2 3 4 5` `1` `A B C D E`<br><br>`1` `1`<br>`121` `0 1`<br>`12321` `1 0 1`<br>`1234321` `0 1 0 1` |
| **Week 12** | • Write a program to read 10 integers in an array. Find the addition of all elements.<br>• Write a program to reverse the elements of array and store it in another array.<br>• Write a Program to print Addition of two matrices.<br>• Program to remove duplicate numbers from a list of numbers and print the list without duplicate numbers.<br>• Write a Program to print Multiplication of two matrices. |
| **Week 13** | • Program to remove duplicate numbers from a list of numbers and print the list without duplicate numbers.<br>• Write a program to sort elements of array.<br>• Read the marks of five subjects obtained by five students in an examination. Display the top two student's codes and their marks.<br>• Write a program to find the length of a string.<br>• Write a program to reverse the string.(without inbuilt Function)<br>• Accept a string from the user and display the following |

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| | • Count of no. of words in the string<br>• No. of letters<br>• No. of digits<br>• No. of special characters.<br>• |
| **Week 14** | • Write a program to read the text. Find out number of lines in it.<br>• Program to extract n characters starting from m in a given string. (String, n and m should be provided as inputs). |
| **Week 15** | • **Revisions** |

| Subject: **Fundamentals of Computer Organization** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0102** | | | Semester: **I** | |
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| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit I:** **[12]**

(1). Basic Working of Peripheral devices

a) Block Diagram of a computer
b) Key board
c) Mouse
d) Display Unit
e) Printer
f) Multimedia Projector
g) Scanner

(2). Number System

a) Decimal System
b) Counting in Binary System
c) Binary Addition and Subtraction
d) Binary Multiplication and Division
e) Conversions
f) Negative Numbers
g) Use of Complements to represent negative numbers
h) Complements in other number system
i) Binary Number Complements
j) Weighted Code
k) BCD Code

l) Octal and Hexadecimal Number System

**UNIT II:** **[12]**

(3). Boolean Algebra and Logic Gates

a) Fundamental Concepts of Boolean Algebra
b) Logic Gates
c) Logical Multiplication
d) AND Gate and OR Gate
e) Complementation and Inverts
f) Evaluation of logical Expression
g) Basic Laws of Boolean Algebra
h) Proof by Perfect Induction
i) Simplification of Expressions
j) De Morgan's Theorems
k) Basic Duality of Boolean Algebra
l) Derivation of a Boolean Algebra
m) Interconnecting Gates
n) Sum of Products And Product of Sums
o) Derivation of POS Expression
p) Derivation of 3 input variables expression
q) NAND Gates and NOR Gates
r) K-Map Method for Simplifying Boolean Expressions
s) Sub cubes and Covering
t) POS Expression and Don't Care
u) Design using NAND Gates and NOR Gates Only

(4). Sequential Logic

a) Flip Flops( RS, JK)
b) Shift Registers(Shift Left, Shift Right)
c) Binary Counter (Asynchronous) Counter

**UNIT III:** **[12]**

(5) Basic Concepts of Combinational Logic

a) Block Diagram of ALU
b) Binary Half & Full Adder(1 bit)
c) Positive and Negative Number
d) Addition in 1's Complement System
e) Addition in 2's Complement System
f) Encoder, Decoder
g) Multiplexer

(6). Introduction to Memory and Storage Devices

a) Memory Hierarchy
b) RAM
c) ROM
d) Virtual memory(overview)
e) Cache memory(overview)
f) Auxiliary memory (overview)

**UNIT IV:** **[12]**

(7). Introduction to Buses

a. Interfacing Buses(Circuit Diagrams not necessary)
b. Concepts of Address Bus, Data Bus and Control Bus

(8). Introduction to Control Unit

a) Construction of Instruction Word
b) Instruction Cycle and Execution Cycle organization of Control Registers

(9). Basic Concepts of Computer Organization

1. Instruction Word Formats
2. Representation of Instruction and Data
3. Addressing Techniques
4. Direct Addressing
5. Immediate Addressing
6. Relative Addressing
7. Indirect Addressing

8. Indexed Addressing

**Text book:**

A. Anadkumar, "*Fundamentals of Digital Circuits",* Publication : PHI

**Reference Books:**

1) Thomas C. Bartee, "*Digital Computer Fundamentals*", TataMcGraw-Hill

2) M.Morris Mano, "*Digital Logic and Computer Design*", PHI

**Digital Learning Resource:**

http://www.tutorialspoint.com/computer_fundamentals/

| Subject: **Mathematical Concepts** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0103** | | | Semester: **I** | |
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| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit I: Pre-requisites** **[12]**

- Functions:
- Domain, Range, Basic definitions
- Identity function, constant function, inverse, one-to-one and onto function
- Limits and Continuity
- Differentiations

**Unit II: Vector Algebra** **[12]**

- Algebraic operations
- Basic Properties and inequalities
- Distance and norms
- Applications: Velocity, Acceleration

**Unit III: Integration** **[12]**

- Basic Definition
- Integration of basic functions
- Method of substitutions
- Integration by parts
- Definite Integrals
- Application : Area, Volume, Arc length

**UNIT IV: Ordinary Differential Equations-1st Order [12]**

- Introduction of Mathematical Modeling
- Basic Definitions
- First Order First Degree Differential Equations
- Variable Separable or Separable Equation
- Homogeneous Equation- Reduction to Separable Form
- Non-homogeneous Equations Reducible to Homogeneous Form
- Exact Differential Equations
- Reduction of Non-exact Differential Equations: Using Integrating Factors
- Linear Differential Equation: First Order
- Bernoulli Equation

**Text Books**


1. B.V.RAMANA, "*HIGHER ENGINEERING MATHAMATICS*", TATA McGraw Hill**.**
2. Dr. B. S . Grewal, "*Elementary Engineering Mathematics*", Khanna Publishers Delhi
3. K. A. Stroud, "*Engineering Mathematics*", 5th Edition , Palgrave, 2001
4. John Bird, "*Basic Engineering Mathematics*" , 5th Edition, Routledge


**Digital Learning Resource:**

http://www.tutorialspoint.com.

| Subject: **Database Management System-I** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA&IT)** | | | | Subject Code: **IMSC0104** | | | Semester: **I** | |
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| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT I:** **[12]**

**Database System**

Need, Advantages, Applications, Cost and Risk, DBMS architecture and Data independence, Database Models, Centralized and Client Server Database Systems.

**DBMS Concepts**:- Database approach- Characteristics, & implications, Advantages of DBMS, Database Architecture - Data Models, Schemas, and Instances, Data Independence, Classification of DBMS –Network & Hierarchical Model - Overview, Data Modeling, Levels of abstraction, Record storage, file organization, index structures for files.

**Unit II:** **[12]**

**Entity Relationship Model**: - Features of E-R Model, Basic modeling concepts: degree of data abstraction, the E-R Model (with example): Entities, Attributes and Entity Sets, Relation and Relationships sets, cardinality, Extended ER Features: Generalization & Specialization - overview.

**The Relational Database Model**:- Relational model concepts & constraints, Enforcing Data Integrity, Integrity Constraints, Relational Data, Logical Data Base Design, E-R to Relational.

**UNIT III:** **[12]**

**Relational Algebra**: - Operations on Relational Algebra.

**Normalization Of Database Tables**:- Introduction to Schema Refinement, Functional Dependencies, Database tables, normalization and database design (with

example),Normal Forms-First, Second, Third, Boyce code Normal Form and Multi-valued Dependencies.

**UNIT IV: [12]**

**Deadlock**: - Deadlock & Deadlock Handling, Locks, Failures, Types of Failures and Database Recovery Methods.

**DBMS Package(Access):-** Access DBMS concepts, Creating a new Database, tables, fields & its properties, data-types, Concept of Primary key, adding/editing data, navigating, sorting, indexing, filtering, designing queries, using forms, report generation facilities, relationships, joins.

**Text books:**

1) S.K. Singh: "*Database Systems, Concepts, Design and Applications*", Pearson Education

**Reference books:**

1) Abraham Silberschatz, Henry F. Korth, "*Database System Concepts*", Sixth Edition, McGraw Hill Publication.
2) Peter Rob, Carlos Coronel: "*Database Systems, Design, Implementation and Management*", seventh edition, Cengage Learning, (2007).
3) Elmsasri ,Navathe: "*Fundamentals of Database Systems*", Fifth Edition, Pearson Education, (2008)
4) Ivan Bayross, "*SQL/PLSQL the programming Language of Oracle*", BPB Publication.
5) Rajshekhar sundarraman, "*Oracle 10g Programming*", Pearson Education
6) Kevin Loney , "*Oracle Database 10g : Complete Reference*" , McGraw Hill Publication.

**Practical Lab**

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| Week 1,2 | **CUST(Custno, cname, state, phone)**<br>**ITEM(itemno, Itemname, Itemprice, Qty_hand)**<br>**INVOICE(Invno, invDate, Custno)**<br>**INVITEM(Invno, Itemno, Qty)** |

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| | 1. Create four table along with necessary constraints( PK,FK,notnull, Unique and<br>Check constraints)<br>2. Write a Insert script for insertion of rows with substitution variables.<br>3. Add a column to the Item table, which will allow us to store Item color field.<br>4. Write SELECT statement for the given queries.<br>a. Display Item name, Price in sentence form using concatenation<br>b. Find total value of each item based on quantity on hand<br>c. Find customers who are from state of Gujarat.<br>d. Display items with unit price of at least Rs. 100<br>e. List items whose range lies between Rs. 200 and Rs. 500<br>f. Which customers are from lalbaug area of Ahmedabad, Baroda and Patan.<br>g. Find all customers whose name start with Letter 'P'.<br>h. Find name of items with 'W' in their name.<br>i. Sort all customers alphabetically<br>j. Sort all items in descending order by their prices.<br>k. Display all customers from M.P alphabetically<br>l. Display invoices dates in 'September 05, 2007' format.<br>m. Find total, average, highest and lowest unit price<br>n. Count number of items ordered in each invoice<br>o. Find invoices in which three or more items are ordered.<br>p. Find all possible combination of customers and items ( use Cartesian product)<br><br>**VEHICLE(vId, Name, Type, Price, Description)**<br>**CUSTOMER(cId, cName, Address, BirthDate, ContactNo)**<br>**VEHICLE_CUSTOMER(vId, cId, PurchaseDate, DeliveryDate)**<br>Vehicle type must be '2w' for two wheeler, '3w' for three wheeler and '4w' for four wheeler.<br>ContactNo should be of 10 digits and Price should be default 0. |

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| | 1. Display details of four wheelers purchased between 14-Jun-2012 to 16-Jun-2012.<br>2. Find those customers (customer id) who have purchased alteast 3 vehicles.<br>3. Display vehicles not purchased so far.<br>4. Display the vehicles of same type.<br>5. Display the customers who have birthday today.<br>6. Display the customers who have purchased 4w on same dates.<br>7. Display the list of vehicles which is not been sold yet.<br>8. Display top three costliest vehicles.<br>Find the customers whose vehicle is not delivered yet. |
| Week 3,4 | **FLIGHT(flightId, company_name, flightFrom, flightTo, flightFare, capacity)**<br>**PASSENGER(pId, Name,Address, City, BirthDate, Gender, ContactNo)**<br>**FLIGHT_SCHEDULED(Transid, flightid, departuredate)**<br>**FLIGHT_PASSENGER(Transid, pId)**<br>Passenger Id must start with 'P'.<br>Flightfare cannot be NULL.<br>1. Display all the flight details which are flying from 12-Jun-2012 to 15-Jun-2012<br>2. Display all Air India flights which flied carrying more than 30 passengers.<br>3. Display total males and females travelling in flightid 101 on 12th June 2012.<br>4. Display all the passengers with starting with name 'm' and flying to Mumbai.<br>5. List all the Flights having the same company.<br>6. Change the Flight Date with is flying from Ahmedabad to Mumbai.<br>7. Display the flights flying after 3 days from today.<br>8. Find the age of all passengers.<br>9. Find the number of male and female passengers. |

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| | 10. Display the flight details who are not flying today.<br>**STUDENT(rollno,name,class,birthdate)**<br>**COURSE(courseno, coursename, max_marks, pass_marks)**<br>**SC(rollno,courseno,marks)**<br><br>1. Add constraint that marks entered are between 0 to 100 only.<br>2. While creating COURSE table, primary key constraint was forgotten. Add the<br>primary key now.<br>3. Display details of student where course is 'Data Base Management System'.<br>4. Select student names who have scored more than 70% in Computer Networks and have not failed in any subject.<br>5. Select names and class of students whose names begin with 'A' or 'B'.<br>6. Display average marks obtained by each student.<br>7. Select all course where passing marks are more than 30% of average maximum marks.<br>8. Select the course where second and third characters are 'AT'.<br>9. Display details of students born in 1975 or 1976. |
| Week 5,6 | **HOTEL (HNO, NAME (not null), ADDRESS, TOTAL_ROOM)**<br>**ROOM (HNO, RNO, RTYPE (not null), LOCATION)**<br>**CHARGES (HNO, RTYPE, CHARGES)**<br>1. Create tables using the above schema along with necessary constraints (Primary OR Composite key, foreign key, not null,Uniqueconstraints).<br>2. Insert four necessary records in each table.<br>3. Add a column to the ROOM table, which allow us to store STATUS whether the room is occupied or vacant.<br>4. Add a check constraint to the room table so that the room type allows the following values only – 's' for single, 'd' for double-seater.<br>5. Sort all hotels in descending order by their address.<br>6. Display the total number of rooms that are vacant presently. |

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| | 7. Display the hotel name and address having total rooms > 50.<br>8. Display the hotel name having the greatest charges on double-seater room.<br>9. Display hotels, which are totally occupied to its fullest capacity.<br>10. Create a simple view with HOTEL names and their ADDRESS only.<br><br>**SALESMAN (SNO, SNAME (not null), CITY, COMMISSION)**<br>**CUSTOMER (CNO, CNAME, CITY, RATING, SNO)**<br>**ORDER (ONO, AMOUNT, ODATE, CNO, SNO)**<br>1. Create tables using the above table schema along with necessary constraints (Primary OR Composite key, foreign key, not null,Uniqueconstraints).<br>2. Insert four necessary records in each table.<br>3. Give all the information about the customers with salesman number S001.<br>4. List all customers whose names begin with letter 'A' or 'B'.<br>5. Count the no. Of salesmen currently having orders.<br>6. Create a copy of your order table. Drop the original order table.<br>7. Create another table London staff having same structure as salesman table where commission is greater than 2 %.<br>8. Calculate the total of orders for each day.<br>9. List all customers and salesmen who shared a same city.<br>10. Double the commission of all salesmen of London. |
| Week 7 | **EMPLOYEE (EMPNO, EMPNAME, STREET, CITY)**<br>**COMPANY (COMPANY_NAME, CITY)**<br>**WORKS (EMPNO, COMPANY_NAME, SALARY)**<br>1. Create tables using the above table schema along with necessary constraints (Primary OR Composite key, foreign key, not null,Uniqueconstraints).<br>2. Insert four necessary records in each table. |

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| | 3. Create a read only view of table Employee where city = "PATANA".<br>4. Find the name of all employees who live in the same city as the company for which they work<br>5. Find all employees whose name start with Letter 'P'.<br>6. Copy all PATNA employees to the table with AHMEDABAD employee.<br>7. Find the Empno with top three salaries.<br>8. Sort all the employees with their city and name in descending order.<br>9. Find employee are from C.G.Road area of city AHMEDABAD and BARODA<br>10. Find the employees who are not in AHMEDABAD or PATNA. |
| Week 8 | **DOCTOR(docId, docName, docSpecialization)**<br>**PATIENT(patientId, patientName, patientAddress, patientCity, patientBloodgroup)**<br>**TRANS(billNo, billdate, docId, patientId, billAmount)**<br>**Apply the following Constraints.**<br>1. docId must start with 'D'.<br>2. patientName must be in upper case letters.<br>**Implement the following SQL Queries.**<br>1. List the patients with A+ blood group treated by Dr.Ramesh.<br>2. List out the details of doctors and number of patients they are serving.<br>3. List the details of patients along with the bill amount and arrange the data according to descending order of the bill amount. |
| Week 9,10 | **STUDENT(Stud_Id, Stud_Name, Address, Date of Birth)**<br>**STUD_EDU (Stud_Id, Degree Name, Year of Passing, Percentage, Grade)**<br>**Implement the following:**<br>**A)**1. Display the students whose age is more than 24 years.<br>2. Display the data of top 3 students in MCA , 2010.<br>**EMPLOYEE (Emp_No, Emp_Name, Basic)** |

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| | **HOLIDAYS (Month, Year, No. of Weekly Off, No. of Holidays)**<br>**EMPTRANS ( Emp_No, Month, Year, Presence Days, Loan Amount)**<br>**Note:** 1. HRA is 20% of basic salary<br>2. DA is 45% of basic salary<br>2. Medical is 5% of basic salary<br>3. P.F. is 4% of basic salary<br>4. Salary is given for (Attendance + Holidays + weekly off) days<br>**Implement the following:**<br>**A)**1. Add a column Emp_Address to the Empmaster table with the not null constraint.<br>2. Delete the records of last two years from the current date. |
| Week 11 | **DEPT_MASTER (Dept_Id, Dept_Name)**<br>**COURSE_MASTER (Dept_Id, Course_Id, Course_Name)**<br>**STRENGTH_MASTER (Dept_Id, Course_Id, Max_Stud_Allow)**<br>**STUD_MASTER (Dept_Id, Course_Id, Stud_No, Stud_Name)**<br>**Implement the following:**<br>**A)**1. Display the department & course where maximum students registered.<br>2. Select name, department & course of students whose names begin with 'A'. |
| Week 12 | **MOVIE(movie_id, movie_name, date_of_release)**<br>**SCREEN (screen_id, location, max_capacity)**<br>**CURRENT (movie_id,screen_id, date_of_arrival, date_of_closure)**<br>**Note:**<br>Value of screen_id must with letter 'S'.<br>Screen location can by any one of 'FF', 'SF', and 'TF'.<br>Date_of_arrival must be less than Date_of_closure.<br>Max_capacity attribute should have a value greater than 0.<br>**Implement the following:**<br>**A)**1. Movie 'Star wars III'was released in the 7th week of 2005. Find out the date of its<br>release considering that a movie releases only on Friday.<br>2. Get the details of movie that closed on date 15-January-2010. |

| | |
|---|---|
| Week 13 | **PRODUCT (productId, productName, Quantity, ProductPrice)**<br>**SALESMAN(sCode, sName, sAddress, BirthDate, ContactNo)**<br>**SALES_ORDER(sCode, productId, qtySold)**<br>**Apply the following Constraints.**<br>1. Product price must be less than 500.<br>2. Salesman Name must be in lowercase and quantity sold must be default 0.<br>**Implement the following SQL Queries.**<br>1. Display the product details whose price is greater than average price of all products.<br>2. Display the salesman details who have not received any order.<br>3. Display the salesman details that have got orders of more than 3 distinct products. |
| Week 14,15 | **SUPPLIER** (sid, sname, contactnum)<br>**PARTS**(pid, pname, color, unit rate)<br>**CATALOG** (sid, pid, qty)<br>**Implement the following:**<br>**A)**1. Find those suppliers who haven't ordered any Parts..<br>2. Create a View that displays the supplier details who have ordered any item having<br>unit rate greater than Rs.500.<br>**COMPETITION (Comp_code, Comp_name (Dancing, Painting, GK, etc.) )**<br>**PARTICIPANTS (Part_no, Part_name, DOB, Address, EmailID, Contact_number )**<br>**SCOREBOARD (Part_no, Comp_code, Judge_no [1, 2, 3], Marks)**<br>**Implement the following:**<br>**A)**1. Create a sequence that allows entering new 'Competition Code' that must start with 'CMP', whenever an insertion is tried to be done.<br>2. Find the event names which have scored the maximum score by the each judge in total. |

| Subject: **Communication and Presentation Skills** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0105** | | | Semester: **I** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 3 | 2 | 0 | 5 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit-I** **[12]**

Perspective of Technical Communication: Communicate well in the work place.

Basics of Technical Communication, Barrier to communication, Technology in Communication

**Unit-II** **[12]**

Effective listening, presentation strategies, Interviews, Group Communication

**Unit-III** **[12]**

Constitutes of Effective writing, written forms, Writing emails, letters, and memos

**Unit-IV** **[12]**

Writing resumes and covering letters,

Job interviewing techniques.

**Text Books**

Meenaksh Raman Sangeeta Sharma, *"Technical Communication-Principles & Practices"*- Oxford higher Education

**Ref. Books:**

1. Herta A Murphy, Herbert W. Hilderbrandt, Jane P Thomas, "*Effective Business Communication*" 7th Edition, Tata McGraw Hill Publication

2. Hedwig Lewis, "*Body Language*", Response Books

3. Ashraf Rizvi, "*Effective Technical Communication*", TMGH Publication

4. Paul V. Anderson, "*Technical Communication – A Reader Centred Approach*", 6th Edition, Thomson Publication

# SEMESTER-II

# Indus University
## Institute of Information and Communication Technology

Integrated Master of Science (CA & IT)

### Teaching Scheme

| Subject Code | Subject Name | | Teaching Learning | | | |
|---|---|---|---|---|---|---|
| | | Theory Session (Hours) | Tutorial Session (Hours) | Laboratory Session (Hours) | Total (Hours) | Credit |
| IMSC0201 | Matrix Algebra and Graph Theory | 4 | 2 | 0 | 6 | 5 |
| IMSC0202 | Database Management Systems using SQL/PL-SQL | 4 | 0 | 4 | 8 | 6 |
| IMSC0203 | Commercial Communication | 4 | 0 | 0 | 4 | 4 |
| IMSC0204 | Advance C Programming | 4 | 0 | 4 | 8 | 6 |
| IMSC0205 | Enterprise Resource Planning | 4 | 0 | 0 | 4 | 4 |
| **Total** | | **20** | **2** | **8** | **30** | **25** |

| Subject: **Matrix Algebra and Graph Theory** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0201** | | | Semester: **II** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 2 | 0 | 5 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit I: Matrix Algebra I** **[12]**

- Introduction
- Determinants
- Types of Matrices
- Algebraic operations
- Inverse of a Matrix
- Elementary Transformation of a matrix
- Rank of a Matrix
- Solution of system of Linear Non-Homogeneous Equations
- Solution of system of Linear Homogeneous Equations

**Unit II: Matrix Algebra II** **[12]**

- Eigen Values and Eigen Vectors - Properties of Eigen Values and Eigen Vectors
- Cayley-Hamilton Theorem
- Real Matrices: Symmetric, Skew Symmetric, Orthogonal
- Complex Matrices: Hermition, Skew Hermition, Unitary Matrices.

**Unit III: Graph theory I** **[12]**

- Graph, Graphs as Models, More Definitions, Vertex Degrees, Sub graphs
- Path and Cycles.

- The Matrix Representation of Graphs
- Fusion, Definition and simple properties
- Bridges.

**Unit IV: Graph theory II** **[12]**

- Spanning Trees, Connector problems
- Shortest path Problems
- Cut vertices and Connectivity
- Euler Tours, Hamiltonian Graphs

**1. Text Book:**

1. John Clark and Derek Allan Holton, *"A First Look at Graph Theory",* Allied Publishers

**2. Reference Books:**

1. R. J. Wilson, "*Introduction to Graph Theory"* - Longman.
2. Douglas B. West, "*Introduction to Graph Theory"* – Second Edition, 2006, Prentice-Hall of India, ISBN-81-203-2142-1.
3. S. Arumugam, S. Ramchandran, "*Invitation to Graph Theory*", Scitech Publication (India) Pvt. Ltd, Chennai.
4. S. A. Choudum, "*A First Course in Graph Theory"*, Macmillan India Limited, ISBN 033392 040 6.
5. G. Suresh Singh, "*Graph Theory"* – Prentice Hall of India,
6. Seymour Lipschutz and Marc Lipson **( Schaum's Series)**, *"Discrete Mathematics"*, McGraw-Hill.
7. T. Veerarajan, *"Discrete Mathematics with Graph Theory and Combinatorics"* McGraw-Hill.
8. K. H. Rosen, *"Discrete Mathematics and its Applications*", 6th edition, Tata McGraw-Hill
9. Bernard Kolmann & others, "*Discrete Mathematical structure*", 6th edition, Pearson Education
10. Edgar G. Goodaire and Michael M. Parmenter, *"Discrete Mathematics with Graph Theory"*, PHI.

11. Narsingh Deo, "*Graph Theory with Aapplications to Engineering and Computer science"*
12. J. P. Tremblay and R. Manohar, *"Discrete Mathematical structures with Application to Computer Science",* Tata McGraw-Hill.
13. D. S. Malik and M. K. Sen, *"Discrete Mathematical structure*", Cengage Learning.

**3. Digital Learning Resource:**

http://www.tutorialspoint.com/computer_fundamentals/

| Program: **Integrated MSc (CA & IT)** | | | Subject Code: **IMSC0202** | | | | Semester: **II** | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT I** **[12]**

Introduction to PL/SQL, Advantages of PL/SQL, The Generic PL/SQL block. Overview of PL/SQL execution environment, PL/SQL data types, constants and variables, Control Structures.

**Cursors**: Types, attributes, Implicit, Explicit, Cursor FOR Loops, Parameterized cursors.

Database Objects: Stored procedures, Functions, Packages.

**Unit II** **[12]**

Database Triggers with types (in detail), Error Handling, Utility of Exceptions, Types of Exceptions, Raising the Exception, user-defined and inbuilt exceptions.

**UNIT III** **[12]**

**Transaction Management**: - Transaction Concepts, properties, states, implementations of Atomicity and Durability, Concurrent Executions, Serializability, and Recoverability.

**Concurrency Control**:- Concurrency Control- Overview, Lock based protocol, Timestamp based protocol, Concurrency control problems, concurrency control with time stamping methods

**UNIT IV** **[12]**

**Overview of Oracle architecture.**

1. Components of database and their introduction.
2. Physical, memory and logical structure of database.

**Object Based Databases and Object Relational Databases**

Introduction to Object Oriented Databases, Characteristics, Advantages, Disadvantages,Introduction, Characteristics, Advantages, Disadvantages

1. **Text books:**
   1. S.K. Singh: "*Database Systems, Concepts, Design and Applications*", Pearson Education

2. **Reference books:**
   1. Abraham Silberschatz, Henry F. Korth, *"Database System Concepts"*, Sixth Edition, McGraw Hill Publication.
   2. Peter Rob, Carlos Coronel: "*Database Systems, Design, Implementation and Management"*, seventh edition, Cengage Learning, (2007).
   3. Elmsasri ,Navathe: "*Fundamentals of Database Systems*", Fifth Edition, Pearson Education, (2008)
   4. Ivan Bayross, "*SQL/PLSQL the programming Language of Oracle"* –BPB Publication.
   5. Rajshekhar Sundarraman, "*Oracle 10g Programming"*, Pearson Education
   6. Kevin Loney , "*Oracle Database 10g : Complete Reference"* , McGraw Hill Publication.

**Practical Lab**

| Week | **PL/SQL Blocks / Procedures/ Functions** |
|---|---|
| 1,2 | 1) Write a PL Block using simple FOR loop to insert ten rows into a database table showing numbers odd or even.<br>Output:<br>NUM_COL1 NUM_COL2 CHAR_COL<br>-------- -------- ---------<br>1 100 i is odd<br>2 200 i is even |

| | |
|---|---|
| | 2) Write a PL Block to increase the salary of employees by 10% who are making less than 10000.<br><br>3) Write a PL Block to display the current date.<br><br>4) Write a PL/Block to find the area of a square and insert into the temp table.<br><br>5) Create PL/SQL Block report displaying employee details in proper format.<br><br>6) Write a procedure which deletes employee records if salary and commission is less than lowest salary range. ( pass parameter as deptno and job)<br><br>7) Write a procedure that displays list of students with atleast three hobbies, out of which one should be 'Playing Cricket'<br><br>8) Write a PL block that in turn calls a procedure and produces output as shown below.<br>List of employees for the project : <name of project><br>DATE: <current date><br>EmployeeName Employee JobNameHoursWorkedStartDate<br><br>9) Write a function which accepts the name of city & returns the Temperature & Humidity.<br><br>**10)** Create a Function which takes Department name and Course name as an argument and return the total number of students registered in that department for that course |

| | |
|---|---|
| Week 3,4 | **DOCTOR(docId, docName, docSpecialization)**<br>**PATIENT(patientId, patientName, patientAddress, patientCity, patientBloodgroup)**<br>**TRANS(billNo, billdate, docId, patientId, billAmount)**<br>**Apply the following Constraints.**<br>3. docId must start with 'D'.<br>4. patientName must be in upper case letters.<br>**Create following PL/SQL Blocks.**<br>1. Write a PL block that accepts patient code and displays the information in below format. Write a procedure that will be called from the PL block.<br>2.<br>Report of <patient name><br>DATE: <current date><br>Blood group : <blood group of patient><br>Doctor's Name: <name of doctor><br>Amount to pay: <bill amount><br>If any new patient detail is entered in Patient table, then maintain a table named trackPatient(patientId, docName, bloodGroup, admittedDate, isDisharged) where admitted date is current date and isDischarged equals to 'N'. If bill is generated for a particular patient, it signifies that patient is discharged and the isDischarged field in the last entry entered in trackPatient table should be set to 'Y'. |
| Week 5,6 | **STUDENT(Stud_Id, Stud_Name, Address, Date of Birth)**<br>**STUD_EDU (Stud_Id, Degree Name, Year of Passing, Percentage, Grade)**<br>**Implement the following:**<br>**A)**<br>1. Write a PL/SQL block to display the detail of students who have done MCA.<br>2. Write a procedure to accept stud-id as input and handle user-defined exception when no data found.<br>**EMPLOYEE (Emp_No, Emp_Name, Basic)**<br>**HOLIDAYS (Month, Year, No. of Weekly Off, No. of Holidays)** |

| | |
|---|---|
| | **EMPTRANS ( Emp_No, Month, Year, Presence Days, Loan Amount)**<br><br>**Note:** 1. HRA is 20% of basic salary<br>2. DA is 45% of basic salary<br>2. Medical is 5% of basic salary<br>3. P.F. is 4% of basic salary<br>4. Salary is given for (Attendance + Holidays + weekly off) days<br>**A)**<br>An organization want to print the pay slips in following format for given Employee<br>Name, Month & Year.<br>Month : Issue Date:<br>Year : Days in Month:<br>_____<br>Employee No: Employee Name:<br>Presence : Holidays : Absence :<br>Salary Days:<br>Earnings Deductions<br>======= ========<br>Basic **:** P.F. **:**<br>Medical **:** Loan **:**<br>H.R.A. **:**Prof. Tax **:** 20 Rs.<br>D.A. **:**<br>Total Earning**:** Total Deduction**:** |

| | |
|---|---|
| Week 7 | **DEPT_MASTER (Dept_Id, Dept_Name)**<br>**COURSE_MASTER (Dept_Id, Course_Id, Course_Name)**<br>**STRENGTH_MASTER (Dept_Id, Course_Id, Max_Stud_Allow)**<br>**STUD_MASTER (Dept_Id, Course_Id, Stud_No, Stud_Name)**<br>**Implement the following:**<br>**A)**<br>Create a package which contains the following procedures.<br>1. Create a Procedure which takes Department name as an argument and returns the courses in that department and Maximum student allow in that course.<br>2. Create a Function which takes Department name and Course name as an argument and return the total number of students registered in that department for that course |
| Week 8 | **MOVIE(movie_id, movie_name, date_of_release)**<br>**SCREEN (screen_id, location, max_capacity)**<br>**CURRENT (movie_id,screen_id, date_of_arrival, date_of_closure)**<br>**Note:**<br>Value of screen_id must with letter 'S'.<br>Screen location can by any one of 'FF', 'SF', and 'TF'.<br>Date_of_arrival must be less than Date_of_closure.<br>Max_capacity attribute should have a value greater than 0.<br>**Implement the following:**<br>**A)**<br>1. Create a trigger that checks the 'screen_id' must start with 'S' whenever an insertion<br>is tried to be done. Raise a user defined exception if the rule is violated.<br>2. Create a package for the following :<br>Create a procedure to print Movie Name where Movie code is been supplied by the user. |

| | |
|---|---|
| Week 9,10 | **PRODUCT (productId, productName, Quantity, ProductPrice)**<br>**SALESMAN(sCode, sName, sAddress, BirthDate, ContactNo)**<br>**SALES_ORDER(sCode, productId, qtySold)**<br>**Apply the following Constraints.**<br>3. Product price must be less than 500.<br>4. Salesman Name must be in lowercase and quantity sold must be default 0.<br>**Create following PL/SQL Blocks.**<br>1. Create a SQL/PLSQL Block that displays all the Salesman details and Product details. Display in proper format:<br><br>SalesmanName ProductName QuantitySold ProductPrice TotalPrice<br>NAMAN PEN 20 4 80<br><br>2. Write the trigger that keeps a track of birth date of every Salesman. Whenever a Salesman record is inserted and if the birth month is the current month then message should be displayed that 'Naman's birthday is in current Month' and if the birth date is current date than message should be displayed that 'Happy Birthday Naman . You are 22 years old'. Note: Also calculate the age of the passenger and then display it. |
| Week 11 | **SUPPLIER** (sid, sname, contactnum)<br>**PARTS**(pid, pname, color, unit rate)<br>**CATALOG** (sid, pid, qty)<br>**Implement the following:**<br>**A)**<br>Create a PL/ SQL block to prepare invoice in following format.<br>Prepare this report Part information wise. Use parameterized cursor.<br>Part Details :::<br>Part Id Part Name Quantity (in Hand) Unit Price<br>----------<br>---------- |

| | |
|---|---|
| | Total Parts Available: <Total Count><br>**COMPETITION (Comp_code, Comp_name (Dancing, Painting, GK, etc.) )**<br>**PARTICIPANTS (Part_no, Part_name, DOB, Address, EmailID, Contact_number )**<br>**SCOREBOARD (Part_no, Comp_code, Judge_no [1, 2, 3], Marks)**<br>**Implement the following:**<br>**A)**<br>1. Create a parameterized cursor to display the total score scored by each student with the competition details, the competition event name have to be supplied as the parameter. If the given event does not exist, throw an user defined exception with appropriate message.<br>2. Create a trigger that checks the 'Competition Code' must start with 'CMP' whenever an insertion is tried to be done. Raise an user defined exception if the rule is violated |
| Week 12 | **BOOK(Book_id, Book_title, Publisher, Book_price, edition)**<br>**AUTHOR(Book_id, Author_name, city, gender)**<br><br>**Apply the following Constraint**<br>1. Create the above given tables with all necessary constraints wherever applicable. (Primary key, foreign key, unique key,. not null and check constraints).<br>2. After creation of above tables, modify marks table by adding a constraint that gender can be only 'F' and 'M'.<br>**Create following PL/SQL Blocks.**<br>1. A. Write a procedure which finds the details of books whose price is more than average price.<br>B. Write a procedure which gives names of authors who havewritten for more than 3 publisher.<br>C. Write a function which counts total number of books writte by a author for 'Nirav' publisher.( pass author name a parameter)<br>**2.** Write a trigger which restrict the record for book price < 50 |

| | |
|---|---|
| Week 13 | **CUSTOMER (custId, custName, custAddress, custBranch)**<br>**FDDETAIL(fdId, fdPeriod, fdInt)**<br>**ACC_CUST_FD_DETAILS(custId, fdId, fdAmount,fdDate)**<br>**Apply the following Constraints.**<br>1. custStartDate should be by default a current date.<br>2. FdAmout should be greater than 5000.<br><br>**Create following PL/SQL Blocks.**<br>1. Write a PL block that shows FD details for the given customer. Use procedure to display. Use function to calculate interest on FD which will return amount after calculating interest.<br>Report for the <customer name><br>DATE: <current date><br>Branch :< name of branch><br>FD Start Date: <start date><br>FD End Date:<end date of FD><br>FD Maturity value : <Amount calculate as per Rate of Interest ><br>2. Write a trigger to ensure that no deletion is allowed on accFdCustDetail, and if any updation is performed, an entry should be added in log table, Translog(sysdate, custId, fidid, oldbalance, newbalance) |
| Week 14 | **SUBJECT** (Sub_code, Sub_name)<br>**STUDENT** (Roll_no, Stud_Name, Gender, DOB, Address)<br>**RESULT**(Roll_No, Sub_code, Marks)<br>**Implement the following:**<br>**A)**Create a PL/SQL block to generate the marksheet subject wise according to the following format:<br>100-90 90-80 80-70 70-60 60-50 <50<br>---<br>Sub Code:<br>Sub Name:<br>--- |

| | |
|---|---|
| | Total (in each group): |
| Week 15 | **DEPARTMENT (Dept_Id, Dept_Name)**<br>**COURSE (Dept_Id, Course_Id, Course_Name)**<br>**STRENGTH (Dept_Id, Course_Id, Max_Stud_Allow)**<br>**STUD_DEPT (Dept_Id, Course_Id, Stud_No, Stud_Name)**<br>**A)**<br>Create a package which contains the following procedures.<br>1. Create a Procedure which takes Department name as an argument and returns the courses in that department and Maximum student allow in that course.<br>2. Create a Function which takes Department name and Course name as an argument and return the total number of students registered in that department for that course**BOOK_CATALOG (book_code, title, Publisher_Name, Category_Name,**<br>**yr_of_release, total_copies )**<br>**MEMBER (member_code, member_name,mem_ship_dt)**<br>**ISSUE (Issue_id, member_code, book_code, issu_ret, issue_date, issue_ret_dt)**<br>**Note:**<br>Add a constraint to Issue table, which will allow only 'I' or 'R' to be entered in theISSUE_RET column, which stores the action whether the book is being issued or returned.<br>**A)**<br>1. Create a function which provides the total number of copies available for the issue for a given book. Book Code to be provided by the user.<br>2. Create a package for the following.<br>Create a function to print the book title when Book code is been supplied by the user. |

| Subject: **Commercial Communication** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0203** | | | Semester: **II** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit I: Introduction to Written Communication:** **[12]**

- Types and Planning of Written Communication
- Essentials of a business letter
- Parts and forms of business letter
- Types of business letter format

**Unit II: Business Letters** **[12]**

- Enquiry and reply letter ; Quotation
- Order – placing, execution and cancellation
- Complain and adjustment letter
- Informal communication letters (Condolence, greeting, email)

**Unit III: Report writing** **[12]**

- Report- writing
- Notice Writing; Circulars; Memo writing
- Note –making
- E-mail writing

**Unit IV:Non-Verbal Communication** **[12]**

- Introductions
- Types

- Characteristics
- Meta Communications

**Text Books:**

1. Chaturvedi&Chaturvedi, "*Fundamentals of Business Communication*"
2. V.K.Jain and OmprakashBiyani, "*Business Communication*"

**Reference Books:**

**1.** MeetaGhosh, "*Business Communication Skills"*

**2.** Wren & Martin, "*English Grammar"*

| Subject: **Advance C Programming** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA&IT)** | | | | Subject Code: **IMSC0204** | | | Semester: **II** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT I:** **[12]**

Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.string manipulation functions, Functions : Defining and accessing a function, passing arguments to a function, specifying arguments data types, function prototypes, recursion. Pointers and Structures pointers: Character pointers, pointer to arrays, array of pointers.

**UNIT II:** **[12]**

Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef

**UNIT III:** **[12]**

Advanced Features in C - Pointers, pointers variables, pointers operators, pointer expression, dynamic allocationfunction - malloc (), free (), calloc(),File management Introduction to file management and its functions text files and binary files, streams, Formatted I/o ,File I/O and File Handling in C , command line arguments

**UNIT IV:** **[12]**

Introduction to dynamic memory allocation, singly link list, operations on singly linklist. Bitwise operators and its usage, C Preprocessor statements.

**Text Books**

1. B.A. Forouzan and R.F. Gilberg, "*Computer science, a structured programming approach*

*using C*" , Third edition, Cengage Learning.

2. Balagurusamy E, "*Computing Fundamentals and C Programming"*, Tata McGraw Hill.

**Reference Books**

1. Ashok N Kamthane, "*Programming with ANSI and Turbo C*", Publisher –Pearson Education.
2. Venugopal & Prasad, "*Mastering C*", Publisher – Tata McGraw Hill.
3. Herbert Schildt, "*C: The Complete Reference*", Publisher – Tata McGraw Hill.

**Practical Lab**

| | |
|---|---|
| Week 1 | • Write a program to print "Hello World" message.<br>• Write a program to print Name , Address and Birth Date.<br>• 3. Write a program to add, multiply and divide two integers and float numbers. |
| Week 2 | • Using While loop print 1 2 3 4 5 …..10.<br>• Print series 2, 4, 6, 8,…….n.<br>• Print series 2, 4, 16,……n*n using shorthand operator and while loop<br>• Write a program to generate fibonnacci series<br>• Write a C program to generate Pascal's triangle.<br>• Write a C program to construct a pyramid of numbers. |
| Week 3 | • Write a program using function to count the area of circle, triangle, rectangle and square.<br>• Write a program that uses a function to check whether an entered three digit number is palindrome or not.<br>• Write a program that uses function digit(N,k) that return the value of the kth digit from the right of the number N. For eg. The function call digit (254693,2) should return 9. |
| Week 4 | • Write a C program using functions that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T. |

| | |
|---|---|
| | • Write a C program using functions to count the lines, words and characters in a given text.<br>• Write a function which accepts a character array as argument from the user. The function should convert all the lowercase characters into uppercase case<br>• Write a function using pointer parameter that calculate maximum element from given array of integer number.<br>• Write a program that demonstrates call by value and call by reference concept in function argument. |
| Week 5 | • Write a function prime that returns 1 if its argument is a prime no. and returns 0<br>otherwise.<br>• Write a program to add first n numbers.<br>• Write a function which returns 1 if the given number is palindrome otherwise<br>returns 0.<br>• Write a function that will scan a character string passed as an argument and<br>• convert all lower-case character into their upper-case equivalent. |
| Week 6 | • Use recursive calls to evaluate<br>f(x) = x – x3/3! + x5/5! – x7/7! + ……<br>• Write a function to reverse the string.<br>Write a program that search an item from array of string. |
| Week 7 | • Write a program to define structure with tag state with fields state name, number of districts and total population. Read and display the data.<br>• Write a program to create a structure of 5 student's roll_no and name and display the records. Use array of structure |
| Week 8 | • Write a program to create structure of bank with accno, holder_name and balance and display them for n holders whose balance is less than 5000.<br>• Write a program to create union of student's roll_no and name and display the records. |

| | |
|---|---|
| Week 9 | • Write a program using pointers to read an array of integers and print its elements in reverse order.<br>• Write a function to calculate the roots of the quadratic equation. The function must use two pointer parameters, one to receive the coefficients a, b, and c, and the other to send the roots to the calling function.<br>• Write a function using pointers to add two matrices and to return the resultant matrix to the calling function. |
| Week 10 | • Write a program to display contents of file on the screen. The program should ask for file name. Display the contents in capital case.<br>• Write a program to find size of the file.<br>• Write a program to combine contents of two files in a third file. Add line number at the beginning of each line<br>• Write a program to display number 1 to 100. Redirect the output of the program to text file. |
| Week 11 | • Write a program to write contents of one file in reverse into another file.<br>• Write a program to count number of lines, words and characters in a file.<br>• Write a program to create a file called dictionary.dat that contains the information such as Name, Surname, City and Phone number. Write a program to accept a City from user and list details of persons having the given city.<br>• Write a program to copy one file to another. While doing so, all extra spaces in a file should be squeezed to one. For eg. If a file contains line "I am learning C", it should be converted to "I am learning C". |
| Week 12 | • Write a program Binary to deciamal using Bit Maniplation<br>• Write a program to create enumerated data type for 12 months |

| | |
|---|---|
| Week 13 | • Write C Program to find sum and product using macros. |
| Week 14 | Write a menu driven program to perform the following operations on a singly linked list.<br>• a.Create<br>• b. Insert<br>• c.Delete<br>• d.Display<br>• e.Exit. |
| Week 15 | • Review |

| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0205** | | | | Semester: **II** |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit I** **[12]**

Introduction of ERP :

Concept of Enterprise, ERP Overview, Integrated information system, The role of Enterprise, Business Modeling, Myths about ERP, Basic ERP Concepts, Intangible benefits of ERP, Justifying ERP investment, Risks of ERP, Benefits of ERP

ERP and related Technology :

Business Intelligence, Data ware housing, Data mining, OLAP, Business Process, Reengineering, SCM, CRM, ERP Security,

**[12]**

**Unit II**

Modules of ERP: Basic modules of ERP Package Human Resources Management, Financial Management, Inventory Management, Quality Management,

Sales and Distribution

**Unit III** **[12]**

ERP for Industries :

ERP for manufacturing Industry: ERP for petroleum companies, ERP for GAS Automobile Industry, ERP for Pharma, ERP for FMCG, ERP for Mining industry Institution, ERP for Telecom, ERP for banks, ERP for Insurance companies

**Unit IV** **[12]**

ERP Implementation :

ERP Lifecycle implementation, implementation Methodologies, ERP package selection,

Reasons for failure and reasons for success of ERP implementation

**1. Text Books**

1. Alexis Leon "*ERP Demystifies*" , Second Edition, TMH
2. Rajesh Ray "*ERP text and cases*", First Edition, TMH

**2. Reference Books**

1. David L. Olson, "*Managerial issues of Enterprise Resource Planning systems*" TMH Edition 2004.
2. Ellen Mon, Bret Wagner "*Concepts in ERP*", Second Edition, Cengage Learning.
3. Ashim Raj Singla, "*Enterprise Resource Planning*" , First Edition, Cengage Learning

# SEMESTER-III

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

# Indus University
## Institute of Information and Communication Technology

Integrated Master of Science (CA & IT)

### Teaching Scheme

| Subject Code | Subject Name | | Teaching Learning | | | |
|---|---|---|---|---|---|---|
| | | Theory Session (Hours) | Tutorial Session (Hours) | Laboratory Session (Hours) | Total (Hours) | Credit |
| IMSC0301 | Introduction of Web Technologies | 4 | 0 | 4 | 8 | 6 |
| IMSC0302 | Object Oriented Programming using C++ | 4 | 0 | 4 | 8 | 6 |
| IMSC0303 | System Analysis & Design | 4 | 2 | 0 | 6 | 5 |
| IMSC0304 | E-Commerce & M-Commerce | 4 | 0 | 0 | 4 | 4 |
| IMSC0305 | Computer Oriented Numerical Methods | 4 | 0 | 0 | 4 | 4 |
| **Total** | | **20** | **2** | **8** | **30** | **25** |

| Program: **Integrated MSc (CA & IT)** | | | Subject Code: **IMSC0301** | | | | Semester: **III** | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**Unit I:** **[10]**

**Introduction to Internet:** Evolution & history of internet, Growth of Internet, Owners of Internet, Services of Internet, How does Internet works?, Internet addressing & DNS, Internet Vs Intranet, Impact of Internet, File transfer, The TELNET , The USENET, Web server, Proxy server, Web Client/Browser, E-Mail: Introduction, E-mail System, E-mail Protocols, About E-mail addresses, Structure of E-mail Message, E-mail clients and server, Mailing list, E-mail security

**Unit II:** **[14]**

**Introduction to HTML:** HTML, HTML tags, Titles and footers, headers, paragraph, Text formatting, Text styles, other text effects, Lists: Types of Lists, Add graphics to HTML: Border, Width, height, Align, Alt Attribute, Tables & Attributes, Linking documents with hyperlinks: External & Internal Document References, Images as Hyperlinks, Frames: <Frameset> & <Frame>, Forms, Introduction to HTML5

**Unit III:** **[12]**

**DHTML and CSS:** Dynamic HTML, Cascading Style sheets: Font, Color & Background, Text, Border, Margin Related, List Attributes, Class, Using <SPAN> tag, External stylesheets, using <DIV > tag

**Unit IV:** **[12]**

**Introduction to JavaScript:**Introduction to Scripting Language, Basics of Java Script, Basics of Programming Techniques, Operators and Expressions, constructs, conditional

checking, loops, Functions: Built In & User-Defined, Dialog boxes: Alert, Prompt, Confirm, Forms: form object, Other built in objects

**Text Book(s):**

1. Ivan Bayross, *"Web Enabled Commercial Application Development using HTML, DHTML, JavaScript, Perl CGI"*, Third revised edition, BPB Publication
2. ISRD group, "*Internet Technology and Web Design",* (First Edition-2011) Publisher: Tata McGraw Hill
3. Kongent Solution, *"HTML 4.0 In Simple Steps*",(First Edition-2010) Publisher: DreamTech Press.

**Reference Books:**

1. Shailendra Mishra , "*Internet Secrets (Internet technology and web design)"*, Publisher: Choice International
2. C Xavier , "*World wide web Design with HTML*", (First Edition-2010) Tata McGraw Hill
3. Ivan Bayross , "*Web Enabled commercial application development using HTML, Javascript, DHTML and php",* BPB Publication
4. Ralph Moseley, M. T. Savaliya *"Developing Web Applications",* (First Edition-2011) Wiley India.
5. Kris, Konrad, Andy*,"HTML & Web Design Tips & Techniques*", (First Edition-2002) Tata McGraw Hill

**Digital Learning Resources:**

1. http://www.w3.org/
2. http://www.tutorialspoint.com/
3. www.tizag.com

**Practical Lab:**

| **Week** | **Topic/Subtopic** |
|---|---|
| 1 | Introduction to Browser and HTML page structure |

| | |
|---|---|
| 2 | Paragraph & Line break tags |
| 3 | Text formatting tags |
| 4 | Hyperlinks, Image as hyperlink |
| 5 | Ordered list, Unordered list, Definition list |
| 6 | Image & Image map |
| 7 | Table, attributes, Table tags |
| 8 | Frame and Frameset |
| 9 | Form elements |
| 10 | DHTML, SPAN Tag |
| 11 | DIV, LAYER tag |
| 12 | Practical of CSS |
| 13 | Javascript: <script> tag, Operators, condition, loops |
| 14 | Array, string manipulation, function |
| 15 | Dialogue Boxes |

| Subject: **Object Oriented Programming using C++** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0302** | | | Semester: **III** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT - I:** **[12]**

Introduction, Principals of OOP, Features of OOP, Beginning with C++, Tokens, Keywords, Identifiers, Expressions and Control Structures, Operators, Functions in C++,

**UNIT – II** **[12]**

Classes and Objects, Constructors and Destructors, Copy constructor, Constructor Overloading, Operator overloading and Type Conversions, Inheritance, Extending classes

**UNIT – III** **[12]**

Pointers Virtual Functions and Polymorphism, Pure Virtual functions, Managing Console I/O Operations, C++ Stream Classes, Managing Output with Manipulators, Working with Files, File Pointers and their manipulations, Templates

**UNIT – IV** **[12]**

Exception Handling, Throwing mechanism, catching mechanism, Introduction to the standard template library, Components of STL, Containers, Manipulating Strings, String Characteristics, Comparing and Swapping

**Text Book(s):**

1. E Balagurusamy, "*Object Oriented Programming with C++",* Tata McGraw Hill

**Reference Books:**

1. Herbert Scildt, "*C++, The Complete Reference*", Tata McGraw-Hill

2. Robert Lafore, "*Object Oriented Programming in C++"*, SAMS Publishing
3. Sunil K. Pandey , "*Thinking in C++*"
4. Yashwant Kanetkar, *"Let Us C++"*

**Practical Lab:**

| Week | Topic/Subtopic |
|---|---|
| 1 | • Write a cpp program to print a hello world in c++.<br>• Write a simple program to read 3 numbers and display the larger number on the screen |
| 2 | • Write a program that will ask for a temperature in Fahrenheit and display in Celsius<br>• Design a menu driven program using switch case which accepts two integer values and program will display menus for addition, subtraction, multiplication, division and ask user to select appropriate choice. |
| 3 | • Write a program takes marks of three subjects. Calculate total & average marks and also check student is pass or fail (if average above or equal to 50 then Pass else fail)<br>• Write a function to read a matrix of size m x n and display |
| 4 | • Write a function that multiplies an array by a number.<br>• Write a function that finds the sum of two arrays and store in third array. |
| 5 | • Write a function to swap two numbers without using third variable.<br>• Design inline functions for add and multiply of two integer numbers |
| 6 | • Define a class to represent a bank account of 3 customers with the following data member as account no, holder name, type of account and balance amount. Use member functions and provide the functionality of deposit, withdraw and checking minimum balance and display account balance. Create menu driven program. |
| 7 | • Design a class "Complex" with real and imaginary members also design appropriate member function to get and print complex numbers. |

| | |
|---|---|
| | • Design a class " Time" with hours and minutes as data members and to get and print data of Time class also design a sum() with object as arguments to add two objects of Time class. |
| 8 | • Design a class "Employee" with appropriate members. Demonstrate array of objects.<br>• Create a class " Complex" with real and imaginary members and to initialize them write overloaded constructor for i) Default constructor ii) Constructor with one parameter iii) Constructor with two parameters. |
| 9 | • WAP to overload all the four operators to operate on two matrix |
| 10 | • Write a menu driven program that can perform the following functions on strings. (Use overloaded operators where possible). (Do not use predefined string class )<br>a. Compare two strings for equality (== operator)<br>b. Check whether first string is smaller than the second (<= operator)<br>c. Copy the string to another<br>d. Extract a character from the string (Overload [])<br>e. Reverse the string<br>f. Concatenate two strings (+ operator) |
| 11 | • Write a program to Single inheritance for following structure.<br>Student Class (rollno, sub1, sub2) and Result class(total,avg)<br>Write a class for Multilevel Inheritance for following structure<br>Student class (rollno),Test Class(sub1,sub2), Result Class(total, avg)<br>• Assume that vehicle class is defined as base class with price and year of manufacturing. Derive two classes namely bus and truck from base class with bus with seating capacity and truck with loading capacity. Develop classes with necessary member functions to get and put data. Demonstrate its use in main() |
| 12 | • Demonstrate use of virtual function for runtime polymorphism.<br>• Write a program which demonstrates the pure virtual function. |
| 13 | • Write a cpp program in which use pointer to Sample class objects are used. Demonstrate it. |

| | |
|---|---|
| | • Write a cpp program which read contents from file and counts no. vowels and consonants in a file |
| 14 | • Write a cpp program which counts no. command line arguments on command line<br>• Write a cpp program which read a file and write contents of a file without white spaces into another file. |
| 15 | • Write a cpp program which reads contents from a file and the even nos. are copied to “even.txt” and odd nos. are copied to “odd.txt” file. |

| Subject: **System Analysis & Design** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0303** | | | Semester: **III** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 2 | 0 | 5 | 24/60 | 00 | 16/40 | 00 | 100 |

**Unit I:** **[12]**

Introduction to Information system development: Information Technology, Information System Components, Categories of Information System, Types of Business Information System -Organizational Structure, Systems Development Techniques and tools, Systems Development Methodology, Systems Development Life Cycle, IT Department, Role of System Analyst

**Unit II:** **[12]**

Requirement Analysis and determination: Tools for determining system requirements, Basic Requirement, Fact finding Techniques, Tools for documenting procedures & Decisions, Data Flow Diagrams-Strategies for Developing DFDs, Data Dictionary

**Unit III:** **[12]**

System design: Analysis to Design Transition, Design - Input, Control, Output, coding standards, coding conventions.

**Unit IV:** **[12]**

System engineering & quality assurance, managing system implementation-Training, conversion. Managing Information system development

**Text Book(s):**

**1.** James A senn,, "*Analysis & Design of Information System*", TMH Pub

**Reference Books:**


i. V. Rajaraman, "*Analysis and Design of Information Systems*", Second Edition, PHI Publication

ii. Kandal & Kandal, "*System Analysis & Design"*

iii. Awad, Elias M, "*System Analysis and Design",* Second Edition, Galgotia Publication

iv. LEE , "*Introduction To S.A.D.",* VOL. 1 & 2


**Digital Learning Resources:**

1.https://en.wikibooks.org/wiki/Systems_Analysis_and_Design/Introduction

2.http://nptel.ac.in/courses/106108102/

3.http://www.tutorialspoint.com/software_engineering/software_analysis_design_tools.htm

4.http://www.w3computing.com/systemsanalysis/

**5.** http://www.freetutes.com/systemanalysis/

| Subject: **E-Commerce & M-Commerce** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA&IT)** | | | | Subject Code: **IMSC0304** | | | Semester: **III** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**UNIT I:** **[12]**

**Introduction to Electronic Commerce :** The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, e-Commerce in Perspective, Electronic commerce and Electronic Business(C2C, G2G, B2G, B2P,B2A,P2P,B2A,C2A,B2B,B2C)

**UNIT II:** **[12]**

**Business Strategy in an Electronic Age:**

**The Value chain:** Supply Chains, Porters value chain model, inter organizational value chains,

**Competitive Advantage:**Compatitive Strategy, Protal Model, First Mover Advantage

**Bussiness Strategy:** Introduction to Bussiness strategy, Strategic implications of IT, Technology, BussinessEnvironment, Cusiness capability, Existing Business Strategy, Strategy fomulation and implementation planning, e-Commerce implementation, e-Commerce Evaluation and case study

**UNIT III:** **[12]**

**Business to Bussiness Electronic Commerce:** Inter Onganisation Transection, Electonic Markets, Electronic Data Interchange (EDI), **EDI:** the Nuts and Bolts, EDI and Bussiness, Inter Organisation e-Commerce, Businss to Consumer Electronic Commerce: Consumer Trade Transection, The internet & Building own website & Marketing : Reasons for building own website, Benefits of website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Banner Exchange, e-Marketing, The Elements of e-Commerce

**UNIT IV:** **[12]**

**Introduction to m-commerce:** Emerging applications, wireless service providers, middleware, wireless infrastructure, different players in m-commerce, and m-commerce lifecycle

**Location-based m-commerce services:** Location, context and user-oriented services, location management in heterogeneous wireless and mobile networks, push/pull services, role of middleware in location-based services, location-enabled devices

E-Commerce Application Configuration: WordPress Woo-Commerce (Only Demo)

**Text Book(s):**

1. E-Commerce Strategy, Technologies and Application by David Whitely, Tata McGraw Hill
2. Mobile Commerce: Technology, Theory and Applications by Brian Mennecke and Troy J. Strader, Idea Group Publishing

**Reference Book(s):**

1. G.S.V Murthy, *"e-Commerce Concepts, Models , Strategies"*
2. Kamlesh K Bajaj and Debjani Nag, *"E-Commerce"*

**Digital Learning Resources:**

1. **General websites offered by magazines and consulting groups:** http://www.brint.com/, http://www.ecommercetimes.com/, http://www.wired.com/, http://www.yankeegroup.com/, http://www.redherring.com/, http://www.businessweek.com/ebiz/index.html
2. **General information services:** http://hotwired.lycos.com/special/ene/index.html?nav=part_three&word=intro_one
3. **Devices and services**
    a. General IT news: http://www.zdnet.com/
    b. B2B: http://www.netb2b.com/resourceGuide/, http://www.ecomworld.com/

c. Technologies: http://www.itpapers.com/ (includes white papers from several technology vendors; requires registration)
d. Technologies and software: http://www.internet.com/sections/it.html
e. Wireless devices and technologies: **http://www.cc.jyu.fi/~wlad/stamina/** (includes links to nearly all vendors' sites)

**4. Mobile business**

a. M-commerce:http://www.mcommercetimes.com/Marketing/80, http://www.gmcforum.com/ (closed site, has useful links to service providers)

| Subject: **Computer Oriented Numerical Methods** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0305** | | | Semester: **III** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**UNIT I:** **[12]**

**Computer Arithmetic:** Number System, Conversion of Numbers, Representation of numbers, Floating point representation, Arithmetic operations with Normalized Floating point Numbers, consequences of normalization, pitfalls in computing.

**Approximation and Errors:** significant digits, Types of errors, absolute and relative error.

**UNIT II:** **[12]**

**Roots of Nonlinear Equations:** Introduction, Methods of Solution, Iterative Methods, Bisection method, False position method, Netwon-Raphson method, Secant method, Rate of convergence of iterative methods.

**UNIT III:** **[12]**

**Solution of simultaneous algebraic Equations:** Gauss elimination method, Gauss-Seidel iterative method, Convergence of Iteration methods.

**Finite Differences**: (Forward and Backward) – Newton's Formulae for Interpolation – Lagrange's Interpolation Formula – Numerical Differentiations & numerical integrations – Trapezoidal and Simpson's rules

**UNIT IV:** **[12]**

Numerical Solution of ordinary differential equations – Taylor's series – Picard's method – Euler's method – Modified Euler's method – Runge Kutta Method

**Text Book(s):**

1. Balagurusamy, E., "*Numerical Methods*", Tata McGraw Hill, 1999.
2. Rajaraman V., "*Computer Oriented Numerical Methods*", 3rd Edition, Prentice Hall India, New Delhi, 1998.
3. Sastry, S.S, "*Introductory Methods of Numerical Analysis*", 4th ed. PHI, 2007.

**Reference Books:**

1. Stoor, Bullrich, "*Computer Oriented Numerical Methods*", Springer-Verlag, 1998.
2. Krishnamurthy, E.V., Sen, S.K., "*Computer Based Numerical Algorithms*", East West Press, 1998.
3. Jain, M.K., Iyengar, S.R.K., Jain R.K., "*Numerical Methods : Problems and Solutions*", New Age Int.(P) Ltd., New Delhi, 1997.
4. Jain, M.K., Iyengar, S.R.K., Jain R.J., "*Numerical Methods for Scientific and Engineering Competition*", New Age Int. (P)Ltd., New Delhi, 1997.
5. N Datta, "*Computer Oriented Numerical Methods*", Vikas Publication House Pvt Ltd, 2004.
6. Timothy Sauer, "*Numerical Analysis*", International Edition, Pearson, 2011

# SEMESTER-IV

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

# Indus University
## Institute of Information and Communication Technology

Integrated Master of Science (CA & IT)

### Teaching Scheme

| Subject Code | Subject Name | | Teaching Learning | | | |
|---|---|---|---|---|---|---|
| | | Theory Session (Hours) | Tutorial Session (Hours) | Laboratory Session (Hours) | Total (Hours) | Credit |
| IMSC0401 | Data Structure | 4 | 0 | 4 | 8 | 6 |
| IMSC0402 | Operating System & Introduction to Unix | 4 | 0 | 4 | 8 | 6 |
| IMSC0403 | Fundamentals of Networking | 4 | 2 | 0 | 6 | 5 |
| IMSC0404 | Computer Oriented Statistical Methods | 4 | 0 | 0 | 4 | 4 |
| IMSC0405 | Management Information System | 4 | 0 | 0 | 4 | 4 |
| **Total** | | **20** | **02** | **08** | **30** | **25** |

| Subject: **Data Structures** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0401** | | | Semester: **IV** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT I:** **[12]**

Data Management concepts, Data types – primitive and non-primitive, Performance Analysis and Measurement (Time and space analysis of algorithms-Average, best and worst case analysis), Types of Data Structures- Linear & Non Linear Data Structures.Array: Representation of arrays, Applications of arrays, sparse matrix and its representation.

**Unit II:** **[12]**

Stack: Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression And Their Compilation, Recursion, Tower of Hanoi Queue: Representation Of Queue, operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue Linked List: Singly Linked List, Doubly Linked list, Circular linked list , Linked implementation of Stack, Linked implementation of Queue, Applications of linked list.

**Unit III:** **[12]**

Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), Threaded binary tree, Binary search trees, Conversion of General Trees To Binary Trees, Applications Of Trees Some balanced tree mechanism, eg. AVL trees, 2-3 trees, Graph-Matrix Representation Of Graphs, Elementary Graph operations, (Breadth First Search, Depth First Search, Spanning Trees, Shortest path, Minimal spanning tree

**Unit IV:** **[12]**

Hashing: The symbol table, Hashing Functions, Collision Resolution Techniques, Sorting & Searching: Sorting – Bubble Sort, Selection Sort, Quick Sort, Merge, Sort Searching – Sequential Search and Binary Search

**Text Book(s):**

1. Jean-Paul Tremblay & Paul G.Sorenson, *"An Introduction to Data Structures with Applications*", Publisher-Tata McGraw Hill.

**Reference Books:**

1. M. A. Weiss, "*Data Structures and Algorithm Analysis in C*", Second Edition, Pearson Education, 2005.
2. R.F. Gilberg and B.A. Forouzan *"Data Structures – a Pseudocode Approach with C*",
3. V. Aho, J. E. Hopcroft, and J. D. Ullman, "*Data Structures and Algorithms*", First Edition Reprint 2003, Pearson Education.
4. R. F. Gilberg, B. A. Forouzan, "*Data Structures",* Second Edition, Thomson India Edition, 2005.

**Digital Learning Resources:**

https://onlinecourses.nptel.ac.in/noc16_cs06

**Practical Lab:**

| Week | Topic/Subtopic |
|---|---|
| | **Arrays& Linked List** |
| **1** | Insert an element at user defined position in an array of type float (unsorted).<br>Description of program:<br>a. Input an array of float.<br>b. Ask position from the user where the new element has to be inserted.<br>c. Insert the element into the array.<br>d. Print the upgraded array. |
| **2** | Insert an element at user defined position in an array of type float (sorted). |

| | |
|---|---|
| | Description of program:<br>a. Input an array of float.<br>b. Search for the position where the new element has to be inserted.<br>c. Insert the element into the array.<br>d. Print the upgraded array. |
| **3** | Delete an element from user defined position in an array of type float<br>Description of program:<br>a. Input an array.<br>b. Ask element has to be deleted.<br>c. Search the position of the element.<br>d. Delete the element.<br>e. Print the upgraded array. |
| **4** | 1. Create a linked list with nodes having information about a student and Insert a new node at specified position.<br>2. Create a linked list with nodes having information about a student and Delete of a node with the roll number of student specified.<br>3. Create a linked list with nodes having information about a student and perform Reversal of that linked list. |
| **5** | 1. Create doubly linked list with nodes having information about an employee and perform Insertion at front of doubly linked list.<br>2. Create doubly linked list with nodes having information about an employee and perform deletion at end of that doubly linked list. |
| **6** | 1. Create circular linked list having information about an college and perform Insertion at front.<br>2. Create circular linked list having information about an college and perform Deletion at end. |
| **7** | 1. Perform addition of two Polynomials using Circular Linked list. |
| | **Stack** |
| **8** | Implement push and pop operations in a stack using an array. The array should be storing the roll numbers of the students in the integer form. Separate functions for |

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| | display, push and pop should be designed with appropriate arguments. The pop function should return the element which is poped out. |
| **9** | 1. Create a stack and perform Pop, Push, Traverse operations on the stack using Linear Linked list.<br>2. Convert Infix Expression to Postfix form using Stack.<br>3. Convert Infix Expression to Prefix form using Stack. |
| | **Queue** |
| **10** | 1. Implement insert and delete operations in a queue using an array. The array should be storing the employee numbers of the employees in the integer form. Separate functions for display, insert and delete should be designed with appropriate arguments.<br>2. Create a Linear Queue using Linked List and implement different operations such as Insert, Delete, and Display the queue elements. |
| **11** | 1. Implement insertion and deletion operations on a circular queue using linked list and each node of the linked list should store information about the lab with name of the lab and number of computers in that lab. Separate functions should be designed to insert and display information in the queue. |
| | **Trees** |
| **12** | 1. Create a Binary Tree (Display using Graphics) perform Tree traversals (Preorder, Postorder, Inorder) using the concept of recursion.<br>2. Create a tree without recursion and perform inorder, preorder and postorder traversal on that tree.<br>3. Implement insertion, deletion and display (inorder, preorder and postorder) on binary search tree with the information in the tree about the details of a automobile (type, company, year of make). |
| | **Sorting& Searching** |
| **13** | 1. To implement Insertion sort using array as a data structure.<br>2. To implement Merge sort using array as a data structure.<br>3. To implement Quick sort using array as a data structure.<br>4. To implement Bubble sort using array as a data structure. |

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| | 5. To implement Selection sort using array as a data structure.<br>6. To implement Binary Search using array as a data structure.<br>7. To Implement Linear Search using array as a data structure. |
| | **Graphs** |
| **14** | 1. Implement the insertion in a graph and then traversal in graph using Breadth First Search.<br>2. Implement the insertion in a graph and then traversal in graph using Depth First Search. |
| **15** | 1. Implement single source shortest path algorithm.<br>2. Implement all pair shortest path algorithm. |

| Subject: **Operating System & Introduction to Unix** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0402** | | | Semester: **IV** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT I:** **[12]**

Computer System Overview, Operating System Overview: Computer System Overview: Basic Elements, Processor Registers, Instruction Execution, Interrupts, The Memory Hierarchy, Cache Memory.

Operating System Overview: Operating System Objectives and Functions, The Evolution of OS, Major Achievements, Characteristics of Modern OS

**Unit II:** **[12]**

**Process and Scheduling:** Process Description and Control: Process States, Process Description, Process Control, UNIX Process Management.

Threads: Processes and Threads.

Concurrency: Mutual Exclusion and Synchronization: Principles of Concurrency, Mutual Exclusion, Software Approaches, Mutual Exclusion: Hardware Support, Semaphores.

**Unit III:** **[12]**

**Concurrency**: Deadlock and Starvation: Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategy, Dining Philosophers Problem, UNIX Concurrency Mechanisms

Uni-processor Scheduling: Types of Scheduling, Scheduling, Algorithms, Scheduling

**Unit IV:** **[12]**

**Memory Management, Input/output Management:** Memory management: Memory management requirements, memory portioning, paging and segmentation

**Virtual memory:** hardware and control structures, OS software, Unix memory management

**Introduction to UNIX:** The UNIX Operating system, LINUX and GNU, The UNIX Architecture, Features of UNIX.

Locating commands, Internal and external commands, Command structure, Flexibility of Command usage: man, cal, date, echo, printf, bc, script, passwd, who, uname, tty

The parent-child relationship, Absolute and relative pathnames, The HOME variable, file attributes, compressing and Archiving files ls, pwd, mkdir ,cd, rmdir,cat,cp,rm,mv,more, file,wc, od, cmp, comm., diff, gzip, gunzip, tar, zip and unzip, chmod ,ln, unmask, find

**Text Book(s):**

1. Stalling W, "*Operating Systems*", 6th edition, Prentice Hall India.
2. Sumitabha Das, *"UNIX Concepts and Applications*", 3rdEdition, TMH

**Reference Books:**

1. Silberschatz, A., Peter B. Galvin and Greg Gagne, "*Operating System Principles*", 8th Ed., Wiley- Indian Edition, 2009
2. Tanenbaum A.S., "*Modern Operating Systems*", 4th Edition, PHI, 2001Digital 6.

**Practical Lab:**

| Unit | Topic/Subtopic |
|---|---|
| 1 | Check the output of the following commands.<br>date, ls, who, cal, ps, wc, cat, uname, pwd, mkdir, rmdir, cd, cp, rm, mv, diff, chmod, grep, sed, head, tail, cut, paste, sort, find. |
| 2 | Write shell script<br>a) Accept numbers and perform addition, subtraction, division and multiplication.<br>b) Accept the string and checks whether the string is palindrome or not. |

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| | c) Accept number and check the number is even or odd, finds the length of the number, sum of the digits in the number.<br>d) Accept strings and replace a string by another string.<br>e) Accept filename and displays last modification time if file exists, otherwise display appropriate message.<br>f) Fetch the data from a file and display data into another file in reverse order. |
| 3 | • Write a script to find the global complete path for any file.<br>• Write a script to broadcast a message to a specified user or a group of users logged on any terminal. |
| 4 | Write a script to copy the file system from two directories to a new directory in such a way that only the latest file is copied in case there are common files in both the directories |
| 5 | • Write a script to compare identically named files in two different directories and if they are same, copy one of them in a third directory.<br>• Write a script to delete zero sized files from a given directory (and all its sub-directories). |
| 6 | • Write a script to display the name of all executable files in the given directory<br>• Write a script to display the date, time and a welcome message (like Good Morningetc.). The timeshould be displayed with "a.m." or "p.m." and not in 24 hours notation. |
| 7 | • Write a script to display the directory in the descending order of the size of each file<br>• Write a script to implement the following commands:<br>Tree (of DOS)<br>which (of UNIX) |
| 8 | Write a script for generating a mark sheet after reading data from a file. File contains student roll no, name , marks of three subjects. |
| 9 | Write a script to make following file and directory management operations menu based: Display current directory<br>• List directory Make directory |

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|---|---|
| | • Change directory Copy a file<br>• Rename a file Delete a file<br>• Edit a file |
| 10 | Write a script which reads a text file and output the following<br>Count of character, words and lines.<br>File in reverse.<br>Frequency of particular word in the file.<br>Lower case letter in place of upper case letter |
| 11 | Write a Script for Simple Database Management System Operation.<br>Database File Contains Following Fields.<br>EMP_NO<br>EMP_NAME<br>EMP_ADDRESS<br>EMP_AGE<br>EMP_GENDER<br>EMP_DESIGNATION<br>EMP_BASIC_SALARY<br>Provide Menu Driven Facility For<br>VIEW RECORD BASED ON QUERY<br>ADD RECORD<br>DELETE RECORD<br>MODIFY RECORD.<br>COUNT TOTAL NUMBER OF RECORDS<br>EXIT |
| 12 | Write A Script To Perform Following String Operations Using<br>Menu: COMPARE TWO STRINGS.<br>JOIN TWO STRINGS.<br>FIND THE LENGTH OF A GIVEN STRING. OCCURRENCE OF CHARACTER AND WORDS E. |

| | |
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| | REVERSE THE STRING. |
| 13 | • Write a script to calculate gross salary for any number of employees Gross Salary =Basic + HRA + DA.<br><br>RA=10% and DA= 15%.<br>• Write a shell script to add the statement #include <stdio.h> at the beginning of every C source file in current directory containing printf and fprintf |
| 14 | Write a script that behaves both in interactive and non-interactive mode. When no arguments are supplied, it picks up each C program from current directory and lists the first 10 lines. It then prompts for deletion of the file. If the user supplies arguments with the script, then it works on those files only. |
| 15 | Write a script that deletes all leading and trailing spaces in all lines in a file. Also remove blank lines from a file. Locate lines containing only printf but not fprintf. |

| Subject: **Fundamentals of Networking** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0403** | | | Semester: **IV** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 2 | 0 | 5 | 24/60 | 00 | 16/40 | 00 | 100 |

**UNIT I:** **[10]**

Introduction, Ancient methods of Communication, Electronic methods of Communication, Digital and analog data, Network, Network topology, Communication system and channel, Asynchronous and synchronous data, Data transmission modes, Introduction to guided communication media- Twisted pair, Coax cable, Fiber optics, Introduction to unguided communication media- Radio, VHF, Microwave, Satellite link, Infrared and Millimeter wave.

**Unit II:** **[14]**

Introduction to data modem, Concept of modulation, frequency, amplitude, Introduction to multi channeling- Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), Code Division Multiplexing (CDM), Switching- Circuit switching, Packet switching, Message switching.

**Unit III:** **[14]**

Introduction to protocol, OSI reference model, TCP/IP protocol suit, Error detection and correction, Ethernet and Token ring, Satellite network, Connecting device- Hub, Router, Gateway, Firewall, Backbone network- Virtual LAN.

**Unit IV:** **[10]**

Internet Protocol- IPv4, IPv6, Internetworking, Introduction to Address mapping – ARP, RARP,BOOTP, DHCP, ICMP, IGMP, Domain Name System (DNS), E-mail, FTP, WWW, HTTP, Multimedia.

**Text Book(s):**

1. Behrouz A. Foruzan, "*Data communication and Networking*", Tata McGraw-Hill
2. Dr. M. Jain, Satish Jain, "*Data Communication and Networking*", BPB Publication

**Reference Books:**

1. Andrew S. Tannenbaum, "*Computer Networks*", Pearson Education, Fourth Edition
2. Wayne Tomasi, "*Introduction to Data Communication and Networking*", 1/e, Pearson Education.

**Digital Learning Resources:**

http://accessengineeringlibrary.com/browse/data-communications-and-networking-fourth-edition

http://www.mheducation.com/highered/product.M0073376221.html

| Subject: **Computer Oriented Statistical Methods** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA&IT)** | | | | Subject Code: **IMSC0404** | | | Semester: **IV** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**UNIT I:** **[10]**

**Descriptive Statistics and Correlation & Regression:** Introduction to Statistics; Applications in Business & Economics; Data: Summarizing Qualitative & Quantitative Data. Exploratory Data Analysis: The Stem-and-leaf Display; Cross Tabulation & Scatter Diagrams; Measures of location: Mean, Median, Mode, Percentiles, Quartiles, Deciles; Measures of Variability: Range, Inter-quartile Range, Variance, Deviation, Standard Deviation, Coefficient of Variation; Measures of Distribution Shape, Relative Location and Detecting Outliers; Exploratory Data Analysis; Weighted Mean & working with Grouped Data Measures of Association between Two Variables; Covariance, Correlation.

**Unit II:** **[14]**

**Introduction to Regression**; Simple linear Regression Model; least Square Method; Coefficient of Determination; Correlation Coefficient; Model Assumptions; Residual Analysis: Validating Model Assumptions; Outliers and Influential Observations, Using the Estimated Regression Equation for Estimation & Prediction

**Unit III:** **[14]**

**Probability & Probability Distribution:** Introduction to Probability; Experiments, Counting, Rules and Assigning Probabilities; Events and their Probabilities; Some basic Relationships of Probability, Conditional Probability,

Random Variables: Discrete, Continuous; Discrete Probability Distributions; Expected Value & Variance; Binomial Probability Distribution. Poisson Probability Distribution;

Normal Probability Distribution, Normal Approximation of Binomial Probabilities, Exponential Probability Distribution

**Unit IV: [10]**

**Sampling, Sampling Distribution & Interval Estimation:** Simple Random Sampling, Point Estimation, Introduction to Sampling Distributions, Sampling Distribution of $\bar{x}$, Sampling Distribution of $\bar{p}$, Properties of Point Estimation, Other Sampling Methods, Population Mean: s Known, s Unknown, Determining the Sample Size; Population Proportion

**Text Book(s):**

1. Anderson, Sweeney, Williams, "*Statistics for business and economics*", 9th edition, Thompson Publication
2. 2. S P Gupta, "*Statistical Methods*", 30th edition, S Chand

**Reference Books:**

1. J.Susan Milton & Jesse Arnold, "*Introduction to Probability & Statistics: Principles & Applications for Engineering & Computing Sciences*"
2. Bharat Jhunjhunwala, "*Business Statistics*", first edition, S Chand, 2008
3. Richard Levin, David Rubin, "*Statistics for Management*", 7th edition, PHI
4. Nabendu Pal, Sahadeb Sarkar, "*Statistics-Concepts and Applications*", 2nd edition, PHI

| Subject: **Management Information System** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0405** | | | Semester: **IV** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 0 | 4 | 24/60 | 00 | 16/40 | 00 | 100 |

**UNIT I:** **[12]**

**Nature of Management:** Meaning, Definition, its nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management- Administration-Organization, Management Skills, Levels of Management.

**UNIT II:** **[12]**

**Evolution of Management Thought:** Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Business Ethics & Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

**UNIT III:** **[12]**

**Functions of Management: Part-I:** Planning – Meaning- Need & Importance, types, Process of Planning, Barriers to Effective Planning, levels – advantages & limitations. Forecasting- Need & Techniques. Decision making-Types - Process of rational decision making & techniques of decision making Organizing – Elements of organizing & processes: Types of organizations, Delegation of authority – Need, difficulties, Delegation – Decentralization, Staffing –Meaning & Importance Direction – Nature – Principles Communication – Types & Importance.

**UNIT IV:** **[12]**

**Functions of Management: Part-II:** Motivation – Importance – theories Leadership – Meaning – styles, qualities & function of leader Controlling – Need, Nature, importance, Process & Techniques, Total Quality Management Coordination – Need – Importance.

**Management of Change:** Models for Change, Force for Change, Need for Change, Alternative Change Techniques, New Trends in Organization Change, Stress Management

**Text Book(s):**

1. T.N.Chhabra, "*Principles and Practice of Management*", Dhanpat Rai & Co. NewDel
2. J.P.Pathak "*Fundamentals of Management"*, Vikas Publication
3. Rajeesh Viswanathan "*Principles of Management: Concept & Cases*", Himalaya Publishing House

**Reference Books:**

1. Horold Koontz and Iteinz Weibrich-"*Essential of Management*", McGrawhills International.
2. J.N.Chandan*, "Management Theory & Practice*"
3. K.Aswathapa, *"Essential of Business Administration"* –Himalaya Publishing House.
4. Dr. L.M.Parasad, "*Principles & practice of management*", Sultan Chand & Sons – New Delhi.
5. Dr. Y.K.Bhushan, "*Business Organization & Management*"
6. J.S. Chandan, "*Management: Concept and Strategies*", Vikas Publishing
7. Tripathi, Reddy, "*Principles of Management*", Tata McGraw Hill
8. Talloo, "*Business organization and Management*", Tata McGraw Hill.

**Digital Learning Resource**

Articles from Indian Management

# SEMESTER-V

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

# Indus University
## Institute of Information and Communication Technology

## Integrated Master of Science (CA & IT)

**Teaching Scheme**

| Subject Code | Subject Name | | Teaching Learning | | | |
|---|---|---|---|---|---|---|
| | | Theory Session (Hours) | Tutorial Session (Hours) | Laboratory Session (Hours) | Total (Hours) | Credit |
| IMSC0501 | Fundamentals of Java Programming | 4 | 0 | 4 | 8 | 6 |
| IMSC0502 | Software Engineering | 4 | 0 | 4 | 8 | 6 |
| IMSC0503 | Client Server Architecture | 4 | 2 | 0 | 6 | 5 |
| IMSC0504 | Operation Research | 4 | 0 | 0 | 4 | 4 |
| IMSC0505 | Software Project Development-I | 0 | 0 | 4 | 4 | 4 |
| **Total** | | **16** | **02** | **12** | **30** | **25** |

| Subject: **Fundamentals of Java Programming** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0501** | | | Semester: **V** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT-I** **[12]**

Fundamentals of Object-Oriented Programming, Java Evolution, Java History, Java Features: Overview of Java Language, Constants, Variables and Data Types.

**UNIT-II** **[12]**

Operators and Expressions, Decision making, branching and looping, Classes, Objects and Methods.

**UNIT-III** **[12]**

Arrays, String, Collections, Interfaces and Packages

**UNIT-IV** **[12]**

Managing Errors and Exceptions, Multi-threading, Applet Programming, Java AWT

**Text Book(s):**


1. Hurbert Schildt, *"Java – The Complete Reference"*, Tata MacGraw Hill.
2. Y. Daniel Mliang, *"Introduction to Java Programming"*, Pearsons Publications.


**Reference Books:**


1. Pravin Jain, *"The Class of java"*, Pearson.
2. Balagurusamy, *"Java Programming"*


**Practical:**

| Week | Topic/Subtopic |
|---|---|
| **1** | Introduction to JDK, JRE, JVM and Java API. Write a Java program to print "Hello World" on command prompt. |
| **2** | Write a simple java application to print a pyramid with 5 lines. The first line has one character, 2nd line has two characters and so on. The character to be used in the pyramid is taken as a command line argument |
| **3** | Write a Java application which takes several command line arguments, which are supposed to be names of students and prints output as given below:<br>(Suppose we enter 3 names then output should be as follows):<br>Number of arguments = 3<br>1: First Student Name is =Tom<br>2: Second Student Name is =Dick<br>3: Third Student Name is =Harry<br>Hint: An array may be used for converting from numeric values from 1 to 20 into String. |
| **4** | Write a class, with main method, which declares floating point variables and observe the output of dividing the floating point values by a 0, also observe the effect of assigning a high integer value (8 digits and above) to a float and casting it back to int and printing |
| **5** | Write a class called Statistics, which has a static method called average, which takes a one dimensional array for double type, as parameter, and prints the average for the values in the array. Now write a class with the main method, which creates a two-dimensional array for the four weeks of a month, containing minimum temperatures for the days of the week(an array of 4 by 7), and uses the average method of the Statistics class to compute and print the average temperatures for the four weeks |
| **6** | Define a class called Product; each product has a name, a product code and manufacturer name. Define variables, methods and constructors, for the Product class. Write a class called Test Product, with the main method to test the methods and constructors of the Product class. |

**7** Define a class called Cartesian Point, which has two instance variables, x and y. Provide the methods get X() and get Y() to return the values of the x and y values respectively, a method called move() which would take two integers as parameters and change the values of x and y respectively, a method called display() which would display the current values of x and y. Now overload the method move() to work with single parameter, which would set both x and y to the same values, Provide constructors with two parameters and overload to work with one parameter as well. Now define a class called Test Cartesian Point, with the main method to test the various methods in the Cartesian Point class

**8** Define a class called Triangle, which has constructor with three parameters, which are of type Cartesian Point, defined in the exercise 7. Provide methods to find the area and the perimeter of the Triangle, a method display() to display the three Cartesian Points separated by ':' character, a method move() to move the first Cartesian Point to the specified x, y location, the move should take care of relatively moving the other points as well, a method called rotate, which takes two arguments, one is the Cartesian Point and other is the angle in clockwise direction. Overload the move method to work with Cartesian Point as a parameter. Now define a class called Test Triangle to test the various methods defined in the Triangle class. Similarly also define a class called Rectangle which has four Cartesian Point

**9** Override the to String, equals and the hash Code methods of the classes Triangle and Rectangle defined in exercises 7 and 8 above, in appropriate manner, and also redefine the display methods to use the to String method

**10** Define an abstract class called Polygon. Provide a constructor which takes an array of Cartesian Point as parameter. Also provide method called perimeter, which calculates and returns the perimeter of the Polygon. Declare abstract method area for this class. Also define a method called move, which takes two parameters x and y to specify the destination for the first point of the Polygon, and overload to make it work for Cartesian Point as a parameter. Now update the classes Triangle and Rectangle in the exercise 8 above, to be a subclass of

the Polygon class. Write appropriate class with main method to test the polymorphism in the area method

**11** Make the class Cartesian Point, belong to a package called edu. indus. geometry, the classes Polygon, Triangle and Rectangle belong to the package edu. indus. geometry. shapes and the classes Test Cartesian Point, Test Triangle, Test Rectangle and Test Polygon belong to the package edu. indus. test. Use appropriate access specifiers for the classes and the members of the classes defined in the earlier exercises. Now onwards all the classes must be defined in a package

**12** Update the classes Triangle and Rectangle, to throw an exception if the Cartesian Point instances passed as parameter does not specify an appropriate Triangle or Rectangle. e.g. In case of Triangle, if the three points are in a straight line, or in case of Rectangle, if the lines when connected cross each other

**13** Define a class called Polygon Manager, which manages a number of Polygon instances. Provide methods to add, remove and list the Polygon instances managed by it. Test the methods of Polygon Manager by writing appropriate class with main method

**14** A college maintains the information about the marks of the students of a class in a text file with fixed record length. Each line in the file contains data of one student. The first 25 characters have the name of the student, next 12 characters have marks in the four subjects, each subject has 3 characters. Create a class called Student Marks, which has student Name, and marks for four subjects. Provide appropriate getter methods and constructors, for this class. Write an application class to load the file into an array of Student Marks. Use the Statistical Data class to compute the statistics mean, median, mode, standard deviation for each of the subjects in the class

**15** In the above exercise, use multithreading, to compute the statistics, after loading the Student Marks from the file, for marks information available for different classes available from files placed in a directory. Create at least five files in a directory with fixed record length to test your code

| Subject: **Software Engineering** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0502** | | | Semester: **V** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**UNIT-I** **[12]**

**Introduction to Software Engineering Practice & Process, Agile Methodology:** What is software?, Evolving role of software, Types of software, Software Myths, Process Framework, Various Process Models, SE practice, Core Principles, Detailed Practices Communication, Planning, Modeling, Construction and Deployment, Introduction to Agile methodologies for software development, Agile Process, Extreme Programming (XP), Brief Overview of Other Agile Process Models: Adaptive Software Development, Scrum

**UNIT-II** **[12]**

**Requirements Modeling, Design Concepts, Architectural Design:** Requirements Engineering, Groundwork for Understanding of Software Requirements, Negotiating Requirements, Validating Requirements, Requirement Analysis, Requirement Modeling, Requirements Modeling for WebApps, Software Quality Guidelines and attributes, Design Concepts, Design Models, Architectural Styles, Architectural Design

**UNIT-III** **[12]**

**Component Design, User Interface Design, WebApp Design:**

Three Views of Component, Designing Class-Based Components, Conducting Component-Level Design, Component-Level Design for WebApps, Designing Traditional Components, Component-Based Development, Golden Rules of User Interface Design, User Interface Analysis and Design, Interface Analysis; Interface Design, WebApp Interface Design, WebApp analysis and Design

**UNIT-IV** **[12]**

**Software Review, Software Testing, Software Configuration Management:** Overview of Review Techniques, Cost impact of Software Defect; Defect Amplification & Removal , Review Metrics and Their Use Informal Review, Formal Technical Review Software Testing :- A Strategic Approach to Software Testing; Software Testing Fundamentals; Levels of testing, types of testing Software Configuration Management: - SCM; SCM Repository, SCM process, Configuration Management for web Apps

**Text Book(s):**

1. Roger Pressman, *"Software Engineering – A Practitioner's Approach*", 7th Edition, TMH.
2. Sommerville, *"Software Engineering"*, 8th Edition, Pearson Education

**Reference Books:**

1. Pankaj Jalote, *"Software Engineering – A Precise Approach"*, Wiley India
2. Waman S. Jawadekar, *"Software Engineering – Principles and Practices"*, TMGH Publication
3. Rajib Mall, *"Fundamentals of Software Engineering"*, Prentice-Hall, 2011

**Digital Learning Resources:**

1. http://highered.mheducation.com/sites/0073375977/information_center_view0/index.htm
2. http://www.tutorialspoint.com/software_engineering/
3. http://readwrite.com/2008/07/22/top_10_concepts_that_every_software_engineer_should_know/
4. http://nptel.ac.in/courses/106101061/
5. http://people.sju.edu/~jhodgson/se/softeng.html

**Practical:**

| Week No | Topics to be covered |
|---|---|
| 01 | Introduction to MS Project, Demonstration of MS Project Menus, toolbars |
| 02 | Practical on MS Project – Gantt Chart, Adding Tasks and Milestones, |
| 03 | Grouping and Relationships between tasks, Assigning resources |

| | |
|---|---|
| 04 | Practical on MS Project - Adding Constraints, Find Critical Path, Slack Time |
| 05 | Practical on MS Project - Total costs of the project by tasks and resources |
| 06 | Case study on SRS : Decide project definition |
| 07 | Analysis of project definition: Prepare introduction, Scope and SRS |
| 08 | Introduction to MS VISIO, Demonstration of MS VISIO Menus, toolbars |
| 09 | Starting a new Visio, Drawing Flowchart |
| 10 | Drawing E-R Diagrams |
| 11 | Draw Data Flow Diagram |
| 12 | Case study on Software Review and Inspection process |
| 13 | Case study on Types of Testing |
| 14 | Case study on Levels of Testing |
| 15 | Case study on CASE Tools |

| Subject: **Client Server Architecture** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | Subject Code: **IMSC0503** | | | Semester: **V** | | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 2 | 0 | 5 | 24/60 | 00 | 16/40 | 00 | 100 |

**UNIT-I** **[14]**

**Introduction**

What is Client/Server computing? Classification of Client/Server Systems, Clients/Server—Advantages and Disadvantages, Misconceptions about Client/Server Computing

**Driving Forces Behind Client/Server Computing**

Introduction, Driving Forces, Development of Client/Server Systems, Client/Server Standards, Client/Server Security, Organizational Expectations, Improving Performance of Client/Server Applications, Single System Image, Downsizing and Rightsizing, Client/Server Methodology

**Architecture of Client/Server Systems**

Introduction, Components, Principles behind Client/Server Systems, Client Components, Server Components, Communications Middle-ware Components, Architecture for business Information System, Existing Client/Server Architecture

**UNIT-II** **[14]**

**Client/Server and Databases**

Introduction, Client/Server in Respect of Databases, Client/Server Database Architecture, Database Middleware component, Access to Multiple Databases, Distributed Client/Server Database Systems, Distributed DBMS, Web/database System for Client/Server Applications

**Client/Server Applications Components**

Introduction, Technologies for Client/Server Application, Service of a Client/Server Application, Categories of Client/Server Applications, Client Services, Server Services, Client/Server Application: Connectivity, Client/Server Application: Layered Architecture

**UNIT-III** **[10]**

**System Development**

Hardware Requirements, Software Requirements, Communication Interface Technology

**Training and Testing**

Introduction, Technology Behind Training Delivery, To whom Training is Required?, Impact of Technology on Training, Client/Server Testing Technology, Testing Client/Server Application

**UNIT-IV** **[10]**

**Client/Server Technology and Web Services**

Introduction, What are Web Services?, Role of Java for Client/Server on Web, Web Services and Client/Server/Browser – Server Technology, Client/Server Technology and Web Applications, Balanced Computing and the Server's Changing Role

**Distributed and Peer-to-peer System**

Introduction to Distributed System Application Architecture, Peer to peer communication system

**Future of the Client/Server Computing**

Introduction, Technology of the Next Generation, Enabling Technology, Client/Server Computing and the Intranet, Future Perspectives, Transformational System

**Text Book(s):**

1. Subhash Chandra Yadav and Sanjay Kumar Singh, "An Introduction to Client/Server computing", New Age International Publishers

**Reference Books:**

1. Patrick Smith, *"Client - Server Computing Professional Reference Series"*, Sams publisher, ISBN0672300656, 9780672300653, 1992
2. *"Client/Server Computing for Dummies*", 2nd IDG Books Worldwide, ISBN:076450066X, Inc. Foster City, CA, USA ©1996

| Subject: **Operation Research** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0504** | | | Semester: **V** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
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**UNIT-I** **[12]**

Basics of Operations Research and Linear Programming

(i) Basics of Operation Research

Operation Research introduction, definitions, features, advantages and applications

(ii) Linear Programming Problem (L.P.P.): Linear Programming Problem (L.P.P.), Mathematical definition of a L.P.P. with its components: objective function and constraints, optimal solution, slack, surplus and artificial variables, Graphic method, Simplex Method.

**UNIT-II** **[12]**

Special Cases of L.P.P.

(i) Transportation problem (T.P.)

Mathematical definition of a T.P., Method to find initial basic feasible solution, North-West corner rule, Least cost cell entry method, Vogel's approximation method, Test of optimality for finding an optimum solution – Modi method.

(ii) Assignment problem (A.P.)

Mathematical definition of an Assignment Problem, Method to find an optimum solution - Hungarian Method.

**UNIT-III** **[12]**

(i)Simulation

Introduction, applications, Monte-Carlo Method, Simulation using Computers

(ii)Management of Inventory

Introduction and terminology of the inventory management, Single Item Inventory Control Models without Shortages, Model –I : EOQ model with constant rate of demand

**UNIT-IV** **[12]**

(i) Project Management (CPM & PERT)

Network concepts, components, rules for network construction, critical path method (CPM) and Project evaluation and Review Techniques (PERT)

(ii) Production scheduling (job sequencing)

Introduction, Johnson's algorithm for n jobs 2 machines, Johnson's algorithm for Njobs m machines, 2 jobs m machines using graphical method.

**Text Book(s):**

1. J. K. Sharma, *"Operations Research – Theory and Application"*, 4th Edition, Macmillan Publishers India Ltd

**Reference Books:**

**1.** H.A. Taha, *"Operations Research"*, 5th Edition Macmillan Publishing Company, 1992.

**2.** KantiSwarup, P.K. Gupta, Man Mohan, *"Operations Research"*, Sultan Chand & Sons, NewDelhi

**3.** Shah, Gor, Soni, *"Operations Research"*, PHI

**4.** V. K. Kapur, *"Operations Research – Problems & Solutions"*, Sultan Chand & Sons, NewDelhi

| Subject: **Software Project Development-I** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0505** | | | Semester: **V** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
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   Communication regarding the Approval / Non-approval of the project will be sent to you within four weeks after the receipt of the project proposal by the Faculty/Supervisor/Guide of Indus University concerned.

2. **PROJECT REPORT FORMULATION**

   The project report should contain the following:

   1. Original copy of the Approved Synopsis.
   2. Certificate of Originality.
   3. The Project Report documentation may be about 70 to100 pages (excluding coding) which should include the following topics (as per the project requirements).

      Table of Contents / Index with page numbering

   - Introduction / Objectives
   - System Analysis
     - Identification of Need
     - Preliminary Investigation
   - Feasibility Study
     - Technical Feasibility
     - Economical Feasibility
     - Operational Feasibility
   - Software Engineering Paradigm applied
   - Software and Hardware Requirement Specifications
   - System Design

- Coding
- Code Efficiency
- Optimization of code
- Validation checks
- Implementation and Maintenance
    - Testing (Testing techniques and Testing strategies used along with the test data and the errors listed for each test case).
- System Security measures (Implementation of security for the s/w developed)
- Cost Estimation of the Project
- Reports
- PERT Chart, Gantt Chart
- Future scope and further enhancement of the Project
- Bibliography
- Appendices (if any)
- Glossary.

**3. General Guidelines**

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- Internal guides (i.e. the faculty members) must devote the time allocated as per the time table to guide the students for the project. The time allocation will be in accordance with the scheme for 6th semester project as given.

# SEMESTER-VI

Approved Vide Agenda Item No. 03 of Minutes of Meeting of Academic Council held on 11 July 17

# Indus University
## Institute of Information and Communication Technology

Integrated Master of Science (CA & IT)

### Teaching Scheme

| Subject Code | Subject Name | | Teaching Learning | | | |
|---|---|---|---|---|---|---|
| | | Theory Session (Hours) | Tutorial Session (Hours) | Laboratory Session (Hours) | Total (Hours) | Credit |
| IMSC0601 | .NET Programming using C# | 4 | 0 | 4 | 8 | 6 |
| IMSC0602 | Open Source Programming using PHP | 4 | 0 | 4 | 8 | 6 |
| IMSC0603 | Software Project Management | 3 | 0 | 0 | 3 | 3 |
| IMSC0604 | Software Project Development-II | 0 | 0 | 10 | 10 | 10 |
| **Total** | | 11 | 0 | 18 | 29 | 25 |

| Subject: **.NET Programming Using C#** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | | Subject Code: **IMSC0601** | | | Semester: **VI** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**Unit I:** **[12]**

Introduction, Programming and application development, Types of application – Windows application, Web application, Console application, Windows service, Web service, Components and objects. OOPS with C#, ASP.Net framework, ASP.Net page life cycle, Introduction to C#, Variables and expressions, Flow control and error handling, Defining classes and class members. Assembly, Components of Assembly, Private and Shared Assembly, Garbage Collector, JIT compiler, Namespaces, Collections.

**Unit II:** **[12]**

Application development using Controls - Button, Label, Link Label, Radio Button, Check Box, Text Box, Rich TextBox, List Box, Checked List Box, List View, Web forms - Menus and Tool Bars, Validation controls, SDI and MDI applications, Introduction to Window application.

**Unit III:** **[12]**

Master page, Themes, Skin, Introduction to CSS. ASP.NET server controls-Types of control, ASP.NET state management engine, Web.config and global.asax files, Caching, Navigation controls, Introduction to user control.

**Unit IV:** **[12]**

Introduction to Database, Using SQL to work with database, Retrieving and manipulating data with SQL, ADO.Net architecture, ASP.Net data controls, Reporting with CSV, Word and pdf.

**Text Book(s):**

1. Stephen Walther, Kevin Hoffman, Nate Dudek, "*ASP.Net 4 Unleashed"*, SAMS Publishing.
2. *"ASP.Net 4.0 Programming 6-in-1 Blackbook"*, DreamTech Publication.
3. J. Kanjilal, "*ASP.Net 4.0 programming*", Tata McGraw-Hill (Unit III to IV).

**Reference Books:**

1. D.Esposito, "*Programming ASP.Net*", Microsoft Press (Dreamtech), Reprint 2011.
2. Vijay Nicoel, "*ASP.Net Visual C#.NET"*, TMH
3. Patel, "*Advanced .Net Technology*", Dreamtech

**Digital Learning Resources:**

1. https://msdn.microsoft.com/en-us/library/gg697787%28v=vs.88%29.aspx
2. http://www.w3schools.com/aspnet/
3. http://www.wrox.com/WileyCDA/WroxTitle/Beginning-ASP-NET-4-in-C-and-VB.productCd-0470502215.html

**Practical Lab:**

| **Unit** | **Topic/Subtopic** |
|---|---|
| Week 1 | Write a C # program to design interface of simple calculator. |
| | Write a C# program to design a page which includes all controls (eg. Registration page) |
| Week 2 | Write a C# program to Create a form with one textbox, one label and one button. Enter your name in textbox. On clicking of button, your name must display into the label. |
| | Write a program to change color of Label text control programmatically in Asp .Net |
| Week 3 | Write a program to Enable-Disable Textbox and change width of TextBox programmatically in Asp .Net |

| | |
|---|---|
| | Write a program to increase and decrease font size programmatically |
| Week 5 | Write C# code to prompt a user to input his/her name and country name and then the output will be shown as an example below:<br>Hello Ram from country India! |
| | Write a C# program to redirect to a page from selecting its name from menu (eg of menu and toolbar) |
| Week 6 | Write a C# program to implement validation controls (Regular, required, range validator). |
| | Write a C# program to implement validation controls( Compare, Custom). |
| Week 7 | Write a C# program to implement Window based application. |
| | Write a C# program to use Window form controls. |
| Week 8 | Write a C# program to implement concept of Master page. |
| | Write a C# program to use CSS in page design. |
| Week 9 | Write a C# program to create and use skin file. |
| | Write a C# program to implement concept of theme in asp.net page |
| Week 10 | Write a C# program to implement concept of state management (client side) |
| | Write a C# program to implement concept of state management (server side) |
| Week 11 | Write a C# program to use site navigation controls (site map, tree view, dynamic menu) |
| | Write a C# program to create and implement a user control |
| Week 12 | Write a C# program to demonstrate use of authentication and authorization. |
| | Write a C# program to implement connection with ADO.Net. |
| Week 13 | Write a C# program to read data from connected database. |
| | Write a C# program to update and delete record from database. |
| Week 14 | Write a C# program to use dataList control. |
| | Write a C# program to create report with CSV, Word and pdf. |
| Week 15 | Revision |

| Subject: **Open Source Programming Using PHP** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA & IT)** | | | Subject Code: **IMSC0602** | | | Semester: **VI** | | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credits** | **University Theory Examination** | **University Practical Examination** | **Continuous Internal Evaluation (CIE)- Theory** | **Continuous Internal Evaluation (CIE)- Practical** | **Total** |
| 4 | 0 | 4 | 6 | 24/60 | 24/60 | 16/40 | 16/40 | 200 |

**Unit I:** **[14]**

**Introduction to PHP and Control Structures**

Introduction: Installation of PHP, PHP configuration in IIS & Apache Web Server and features of PHP, Understanding WAMP, How PHP code is parsed, Embedding PHP and HTML, Executing PHP and viewing in Browser, Data types, Operators, PHP variables: static and global variables and Comments in PHP.

Condition statements: If…Else, Switch, ? Operator, Loops, While, Break Statement, Continue, Do…While, For, For each, Exit, Die, Return, Arrays in PHP, FORM element, INPUT elements, Validating the user input, Passing variables between pages, Passing variables through a GET, Passing variables through a POST, Passing variables through a REQUEST.

**Unit II:** **[12]**

**Functions and Handling sessions and cookies**

Built-in functions :String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print

Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand

Date Functions: Date, getdate, setdate, Checkdate, time, mktime

Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort, assort, array_merge, array_reverse

File Handling Functions: fopen, fread, fwrite, fclose, file_exists, is_readable, is_writable, fgets, file, file_get_contents, file_put_contents, ftell, fseek, rewind, copy, unlink, rename

Miscelleneous Functions: define, constant, include, require, header, die

User Defined Functions, Concept of Session, Starting session, Modifying session variables, Unregistering and deleting session variable, Concept of Cookies, Handling of Cookies, How to upload files.

**Unit III:** **[12]**

**PHP with Oops (object oriented programming)**

Object Oriented Concepts**:** Understanding Object, Define a class, Class attributesCreating an object, Object constructors & destructors, Class constants, Static method, Class inheritance, Abstract classes, Final keyword, Implementing Interface, Object serialization

**Unit IV:** **[10]**

**MySql Introduction:**

Installation of MySql, Types of tables in mySql, Query in mySql: select, insert, update, delete, Truncate, Alias, Order by, Backup and Restore, Database connectivity of PHP with mySql.

**Text Book(s):**

1. Stever Holzner, "*The complete Reference PHP*", McGrow Hill

**Reference Books:**

1. Matt Doyle - *"Beginning PHP 5.3*", Wrox Publication
2. Tim Converse, Joyce Park, Clark, "*PHP 5.0 and MySql Bible*"
3. Steve Suehring, "*MySql Bible",* Publisher: John Wiley & Sons
4. Peter Moulding, Morgan, "*PHP Black Book*", Publishers: John Wiley & Sons

**Digital Learning Resources:**

1. https://php.net
2. https://www.w3schools.com
3. http://www.tutorialspoint.com/**php**/
4. https://www.codecademy.com/learn/**php**

**Practical Lab:**

| Sr. No | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hours. Required |
|---|---|---|
| 1 | Write a PHP script to display Welcome message. | 2 |
| 2 | Write a PHP script to demonstrate arithmetic operators, comparison operator, and logical operator. | 2 |
| 3 | Write PHP Script to print Fibonacci series. | 2 |
| 4 | Write PHP Script to generate result and display grade. | 2 |
| 5 | Write PHP Script to find maximum number out of three given numbers. | 2 |
| 6 | Write PHP Script for addition of two 2x2 matrices. | 2 |
| 7 | Write PHP script to demonstrate Variable function. | 2 |
| 8 | Write PHP script to obtain 5! Using function. | 2 |
| 9 | Write PHP script to demonstrate string function. | 2 |
| 10 | Write PHP script to demonstrate Date functions. | 2 |
| 11 | Write PHP script to demonstrate Math functions. | 2 |
| 12 | Write PHP script to demonstrate Array functions Using Switch statement. | 2 |
| 13 | Write PHP script to demonstrate File functions. | 2 |
| 14 | Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page. | 2 |
| 15 | Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page. | 2 |
| 16 | Write two different PHP script to demonstrate passing variables through a URL. | 2 |
| 17 | Write two different PHP script to demonstrate passing variables with sessions. | 2 |
| 18 | Write PHP script to demonstrate passing variables with cookies. | 2 |
| 19 | Write a program to keep track of how many times a visitor has loaded the page. | 2 |

| | | |
|---|---|---|
| 20 | Write an example of Error-handling using exceptions. | 2 |
| 21 | Write a PHP script to connect MySQL server from your website. | 2 |
| 22 | Write a program to read customer information like cust_no, cust_name, Item_purchase, and mob_no, from customer table and display all these information in table format on output screen. | 2 |
| 23 | Write a program to edit name of customer to "Bob" with cust_no =1, and to delete record with cust_no=3. | 2 |
| 24 | Write a program to read employee information like emp_no, emp_name, designation and salary from EMP table and display all this information using table format. | 2 |
| 25 | Create a dynamic web site using PHP and MySQL. | 8 |

| Teaching Scheme | | | | Examination Evaluation Scheme | | | | |
|---|---|---|---|---|---|---|---|---|
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**Unit I:** **[08]**

Process based approach for Project Execution, Capability Maturity Model for Software, Proposals and Contracts, Requirement Specification and Management, Traceability Management, Requirement Change Management

**Unit II:** **[10]**

Process Definition & Tailoring, Process Database & Process Database and Process Capability Baseline, Effort Estimation and Scheduling, Quality Planning and Defect Estimation

**Unit III:** **[10]**

Risk Management, Project Management Plan, Configuration Management

**Unit IV:** **[08]**

Life Cycle Execution, Peer Review, Project Monitoring & Control, Project Audits, Project Closure, Introduction to CASE Tools for Project Management

**Text Book(s):**

1. Pankaj Jalote, "*CMM in Practice*"
2. Pankaj Jalote, "*Software Project Management In Practice*"
3. Ian Sommerville, "*Software Engineering*", Addison Wesley

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1. Ian Sommerville, *"Software Engineering"* Addison Wesley
2. Bob Hughes and Mike Cotterell, "*Software Project Management*", Third Edition 2002, Mc Graw-Hill.
3. "*CMMI: Guidelines for Process Integration and Product Improvement*" (2nd Edition)
4. James Persse,*"Project Management Success with CMMI®: Seven CMMI Process Areas",* Publisher: Prentice Hall
5. Jeannine M. Siviy, M. Lynn Penn, Robert W. Stoddard, *"CMMI and Six Sigma: Partners in Process Improvement"*
6. Roger Pressman, "*Software Engineering – A Practitioner's Approach*", 7th Edition , TMH.
7. Walker Royce, "*Software Project Management A Unified Framework*", Pearson Education, First Impression.
8. Kathy Schwalbe, *"Project Management in IT*", Second Indian Reprint 2009, Cengage Learning, 2007

**Digital Learning Resources:**

1. http://www.tutorialspoint.com/software_engineering/software_project_management.htm
2. https://cs.uwaterloo.ca/~dberry/COURSES/software.engr/lectures.pdf/projman.pdf
3. http://www.stellman-greene.com/about/applied-software-project-management/applied-software-project-management-slides/

| Subject: **Software Project Development – II** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program: **Integrated MSc (CA&IT)** | | | | Subject Code: **IMSC0604** | | | Semester: **VI** | |
| | | | | | | | | |
| **Teaching Scheme** | | | | **Examination Evaluation Scheme** | | | | |
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