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 andCommunication Technology

Integrated Master of Computer Application

Teaching Scheme

Subject Code	Subject Name		Teaching Learning			
		Theory Session (Hours)	Tutorial Session (Hours)	Laboratory Session (Hours)	Total (Hours)	Credit
IMCA0101	Introduction to Web	4	0	4	8	6
IMCA0102	Principals of Programming Language	4	0	4	8	6
IMCA0103	Computer Fundamentals	4	0	0	4	4
IMCA0104	Matrix Algebra & Graph Theory	4	2	0	6	5
IMCA0105	Communication & Presentation Skills	3	2	0	5	4
Total		**19**	**04**	**08**	**31**	**25**

Subject: **Introduction to Web**								
Program: **Integrated MCA**				Subject Code:**IMCA0101**			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**
04	00	04	06	24/60	24/60	16/40	16/40	200

UNIT-I **[12]**

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, Governance on Internet, Getting connected, Different types of connections (Dial-UP connections, ISDN, ADSL, Leased Line Connections, Satellite Connections), Level off internet connectivity (One level, Two level, Three level), Internet service provider, Internet account options, Telephone option, Protocol option, Service option

Switching:(Circuit switching, Packet switching, Message switching), Routers, Gateways, Current trends on internet (Iphone, VOIP, Internet video, E-commerce, Wireless communication, Collaborative computing, Podcasting, Video conferencing) Interactivity tools(Overview) (ASP, ActiveX control, VB script, Java script, Front page, Flash • Multimedia and animation • WWW (Evolution of web, Basic element of www, Web browsers)

UNIT-II **[12]**

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

Remote Login: Telnet, Introduction to Telnet, Telnet Client, The Telnet protocol, Telnet emulation

File Transfer Protocol: Introduction, Types of FTP server, FTP software, Types of search(match)

Search engines: Introduction, Criteria, Search Agent, How to register to search engine, About Popular search engines

USENET: NEWS group hierarchies, News reader, Who administers, Common task of news readers, Relation between news &e-mail

Chatting & IRC: Client software, Chat server, IRC network

Internet Security: Overview, Aspect & needs of security, E-mail security, Web security

VPN: Introduction, Connection, Protocol, Client

Firewall: Types, Firewall with GUI, Choosing a suitable firewall, Advantage, Drawback

UNIT-III **[12]**

Introduction to HTML : HTML Introduction, HTML document structure, Adding text in newline(
</BR>), Creating heading (<h1></h1> to <h6></h6>)., Creating a paragraph (<P>--</P>), Creating a horizontal ruler (<HR>--</HR>), Sub Script, Super Script, Text Alignment(<align>---</align>), Formatting Of text (<B>, <U>, <I>), Font tag, Grouping of text (<Div>---</Div>, <Span>---</Span), Indenting Quotation(<Block quote>---</Block quote>), Scrolling text<marquee>---</marquee>), Working with Character entity / Special character, HTML Comments

Working with list: Order list, Unordered list, Definition list

Working with table: Creating table, Specifying caption, Table headings, All table related Tags & attributes.

UNIT-IV **[12]**

Advanced HTML: Working with Frames <frameset>------</frameset>& all attribute of tag, <Frame>----</frame>& all attribute of tag(including target attribute)

Working with Links: anchor tag with its entire attribute.

Working with Images:<img>---</img>& all its Attributes, Creating Image maps (<map>---</map>&<area>---</area>) and their attributes

Working with multimedia: Sound & video

Working with Forms: Creating form(<form>--</form>) & all its attribute, Adding controls to an HTML form, <Input>---</input> tag and its all attribute, <text area>-----</text area>, Adding a selection control, Grouping the control of html forms (<Field set> and <legend> tags)

Layer: Layer tag, Layer Attribute, Method, Event Handler, Use of Layer

Text Book(s):

1. ISRD group, "*Internet Technology and Web Design*", First Edition,Tata McGraw Hill, 2011
2. Kongent Solution, *"HTML 4.0 In Simple Steps"*, First Edition, DreamTech Press, 2010

Reference Books:

1. Shailendra Mishra, *"Internet Secrets (Internet technology and web design)"*, Choice International
2. C Xavier, "World wide web Design with HTML" First Edition, Tata McGraw Hill, 2010
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, Wiley India, 2011
5. Kris, Konrad, Andy, *"HTML & Web Design Tips & Techniques*", First Edition, Tata McGraw Hill, 2002

Digital Learning Resources

http://www.w3.org/

Practical Lab

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
1	**Practicals related to HTML formatting tags and tag.** 1 Creating and saving simple HTML document. And opening in web browser. 2 Modifying the background of HTML webpage (with colors & images) 3 Insert a line break in web page content. (use of) 4 Creating headings on web page (to) 5 Creating a paragraph(Using -----) 6 Creating a horizontal ruler (using <hr>----</hr>) 7 Demonstrate use of subscript, super script, align tag 8 Format the text by using formatting tags like bold italic and underline.	**10**

	9	Create web page which demonstrate the use of font tag	
	10	Create web page with tag.	
2	**Practicals related to ,<blockquote>,<marquee>,special characters and list tag**		**10**
	1	Create web page with tag.	
	2	Create web page with <blockquote> tag.	
	3	Demonstrate the use of Marquee tag. (in more than three web page)	
	4	Write HTML program to insert special characters And comment.	
	5	Write HTML program to create a simple order list.	
	6	Write HTML program to create a simple Unordered list.	
	7	Write HTML program to create definition list.	
	8	Write HTML program to create order list within Unordered list.	
	9	Write HTML program to create Unordered list within Unordered list.	
	10	Write HTML program to create order list within order list.	
3	**Practicals related to list, table and frame**		
	1	Write HTML program to create Unordered list within order list.	
	2	Write HTML program to create nested list. Like fruits, vegetables, subjects etc.	
	3	Write HTML program to create simple table.	
	4	Write HTML program to create complex table.	
	5	Like Mark sheet, Electricity bill, telephone bill, time –table etc.	**10**
	6	Write HTML program to create three horizontal frame in single web page	
	7	Write HTML program to create three vertical frame in single web page	
	8	Write HTML program to create both horizontal & vertical frame in single web page.	
4	**Practicals related to link, image map, sound & video file and form**		**10**
	1	Write HTML program to demonstrate use of different LINK,	

ALINK and VLINK attributes of body tag.

2 Linking different section of single web page.

3 Inserting Image on a web page (with all attributes).

4 Write HTML program in which make image as a link.

5 Write HTML program to create Image Map.

6 Write HTML program to add sound & video.

7 Write HTML program to create a form including all element of forms.

8 Write HTML program to e-mail registration form.

9 Write HTML program to enter bill detail form.

10 Write HTML program to enter student detail form. Etc.

Subject: **Principles of Programming Language**								
Program: **Integrated MCA**				Subject Code:**IMCA0102**			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**
04	00	04	06	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 StructureControlStatement : 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

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.
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)**

What is compression of file?

What are the tools available for compression of data and files on the storage?

Perform compression operation on the system and find out the results of compression?

Disk management

(A) What is disk management?

(B) What is defragmentation of disk, formatting of disk, partitioning.

(C) How to assign user rights to a partition

(D) Find out the disk management tools with your OS (Windows XP), and any other tools available for disk management?

(E) Perform disk cleanup with CCleaner tool and taking backup of our data on the system?

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.

(B) Protocols

(C) IP v4 configuration in Windows.

(D) HTTP, HTTPS

(E) FTP

(F) WWW, web browsers (Installation, configuration, and add-ons management).

(G) Create E-mail account, sending e-mail with attachments, filtering mails, how to use institute mail account.

(H) Uploading and downloading files.

(I) Search Information

(J) Google advance search options,

(K) Exploring Google scholar service.

Week 7 **Using input and output statements, Operators**

- Write a program to print the address of INUDS.

- Write a program to perform basic arithmetic operators on given two numbers.
- Find the area and perimeter of square and rectangle and circle. Input the side(s) through the keyboard. (use PIE as symbolic constant)
- 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.
- Write a program to enter the integer number and convert it into Rs and Paisa.
- 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.
- Write a program to enter the temperature in Fahrenheit and convert it to Celsius.[C = ((F-32)*5)/9]
- 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.
- Write a program to check whether the given character is a vowel of not.
- 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)
- 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.
- Write a program to calculate total salary of an employee.
- total salary = basic + da + hra + ta. da = 50% of basic.

Basic	hra	ta
<6000	400	100
6001>= &<10000	1400	300
>=10000	2400	700

Week 10

- Write a program to print 1 to 10 numbers using
  - i) Go to statement
  - ii) For statement
- Write a program to display the largest of 5 numbers using while statement and ternary operator.
- Write a program to print Fibonacci series of given number.
- Write a program to find factorial of a number.
- 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.
- Example:153----1 + 5 +3 = 1 + 125 + 27 153

- 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)
- Write a program to list all prime numbers within given range.
- Write a program to draw following patterns:

Write a program to draw following patterns:

```
*          1          5 4 3 2 1          A
**         a b        4 3 2 1            A B
***        1 2 3      3 2 1              A B C
****       a b c d    2 1                A B C D
*****      1 2 3 4 5  1                  A B C D E
```

```
   1          1
 121          0 1
12321         1 0 1
1234321       0 1 0 1
```

Week 12

- Write a program to read 10 integers in an array. Find the addition of all elements.
- Write a program to reverse the elements of array and store it in another array.
- Write a Program to print Addition of two matrices.
- Program to remove duplicate numbers from a list of numbers and print the list without duplicate numbers.
- 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.
- Write a program to sort elements of array.
- Read the marks of five subjects obtained by five students in an examination. Display the top two student's codes and their marks.
- Write a program to find the length of a string.
- Write a program to reverse the string.(without inbuilt Function)
- Accept a string from the user and display the following
  - Count of no. of words in the string

- No. of letters
- No. of digits
- No. of special characters.

Week 14

- Write a program to read the text. Find out number of lines in it.
- 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: **Computer Fundamentals**								
Program: **Integrated MCA**				Subject Code:**IMCA0103**			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**
04	00	00	04	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/

Integrated MCA, IICT, INDUS University

Subject: **Matrix Algebra and Graph Theory**								
Program: **Integrated MCA**				Subject Code: **IMCA0104**			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**
04	02	00	05	24/60	00	16/40	00	100

UNIT-I **[12]**

Matrix Algebra I

- 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 **[12]**

Matrix Algebra II

- 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 **[12]**

Graph theory I

- 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 **[12]**

Graph theory II

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

Text Book:

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

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'sSeries),*"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. NarsinghDeo, "*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.

Digital Learning Resource:

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

Subject: **Communication & Presentation Skills**								
Program: **Integrated MCA**				Subject Code:**IMCA0105**			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**
03	02	00	04	24/60	00	16/40	00	100

UNIT-I **[12]**

Introduction to Written Communication

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

UNIT-II **[12]**

Business Letters

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

UNIT-III **[12]**

Report writing

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

UNIT-IV **[12]**

Non-Verbal Communication

- 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. Meeta Ghosh, "*Business Communication Skills*"
2. Wren & Martin, "*English Grammar*"

SEMESTER-II

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 Computer Application

Teaching Scheme

Subject Code	Subject Name		Teaching Learning			
		Theory Session (Hours)	Tutorial Session (Hours)	Laboratory Session (Hours)	Total (Hours)	Credit
IMCA0201	C Programming	04	00	04	08	06
IMCA0202	Database Management System - I	04	00	04	08	06
IMCA0203	Discrete Mathematics	04	02	00	06	05
IMCA0204	Microprocessor	04	00	00	04	04
IMCA0205	Principles of Management	04	00	00	04	04
Total		**20**	**02**	**08**	**30**	**25**

Subject: **C Programming**		
Program: **Integrated MCA**	Subject Code:**IMCA0201**	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
04	00	04	06	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. • Write a program to print Name, Address and Birth Date. • 3. Write a program to add, multiply and divide two integers and float numbers. • Using While loop print 1 2 3 4 5 …..10. • Print series 2, 4, 6, 8,…….n.
Week 2	• Print series 2, 4, 16,……n*n using shorthand operator and while loop • Write a program to generate fibonnacci series • Write a C program to generate Pascal's triangle. • 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. • Write a program that uses a function to check whether an entered three digit number is palindrome or not. • 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. • 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.
Week 4	• Write a C program using functions to count the lines, words and characters in a given text. • Write a function which accepts a character array as argument from the user. The function should convert all the lowercase characters into uppercase case

- Write a function using pointer parameter that calculate maximum element from given array of integer number.
- Write a program that demonstrates call by value and call by reference concept in function argument.

- Write a function prime that returns 1 if its argument is a prime no. and returns 0
  otherwise.
- Write a program to add first n numbers.

Week 5

- Write a function which returns 1 if the given number is palindrome otherwise
  returns 0.
- Write a function that will scan a character string passed as an argument and
- convert all lower-case character into their upper-case equivalent.
- Use recursive calls to evaluate

Week 6

f(x) = x – x3/3! + x5/5! – x7/7! + ……

- Write a function to reverse the string.
  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.
- 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.
- 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.
- 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. • Write a function using pointers to add two matrices and to return the resultant matrix to the calling function. • Write a program to display contents of file on the screen. The program should ask for file name. Display the contents in capital case.
Week 10	• Write a program to find size of the file. • Write a program to combine contents of two files in a third file. Add line number at the beginning of each line • 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. • Write a program to count number of lines, words and characters in a file. • 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. • 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 • 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. • a.Create

- b.Insert
- c.Delete
- d.Display
- e.Exit.

Week 15

- Review

Subject: **Database Management System-I**								
Program: **Integrated MSc (CA & IT)**				Subject Code:**IMCA0202**			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**
04	00	04	06	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 and Navathe, "*Fundamentals of Database Systems*", Fifth Edition, Pearson Education, (2008)
4. Ivan Bayross, "*SQL/PLSQL the programming Language of Oracle*", BPB Publication.
5. Rajshekharsundarraman, "*Oracle 10g Programming"*, Pearson Education
6. Kevin Loney, "*Oracle Database 10g : Complete Reference*" , McGraw Hill Publication.

Practical Lab

Week	**CUST(Custno, cname, state, phone)**
1,2	**ITEM(itemno, Itemname, Itemprice, Qty_hand)**
	INVOICE(Invno, invDate, Custno)
	INVITEM(Invno, Itemno, Qty)
	1. Create four table along with necessary constraints(PK,FK,notnull, Unique and
	Check constraints)
	2. Write a Insert script for insertion of rows with substitution variables.
	3. Add a column to the Item table, which will allow us to store Item color field.
	4. Write SELECT statement for the given queries.

a. Display Item name, Price in sentence form using concatenation

b. Find total value of each item based on quantity on hand

c. Find customers who are from state of Gujarat.

d. Display items with unit price of at least Rs. 100

e. List items whose range lies between Rs. 200 and Rs. 500

f. Which customers are from lalbaug area of Ahmedabad, Baroda and Patan.

g. Find all customers whose name start with Letter 'P'.

h. Find name of items with 'W' in their name.

i. Sort all customers alphabetically

j. Sort all items in descending order by their prices.

k. Display all customers from M.P alphabetically

l. Display invoices dates in 'September 05, 2007' format.

m. Find total, average, highest and lowest unit price

n. Count number of items ordered in each invoice

o. Find invoices in which three or more items are ordered.

p. Find all possible combination of customers and items (use Cartesian
product)

VEHICLE(vId, Name, Type, Price, Description)

CUSTOMER(cId, cName, Address, BirthDate, ContactNo)

VEHICLE_CUSTOMER(vId, cId, PurchaseDate, DeliveryDate)

Vehicle type must be '2w' for two wheeler, '3w' for three wheeler and '4w' for four wheeler.

ContactNo should be of 10 digits and Price should be default 0.

1. Display details of four wheelers purchased between 14-Jun-2012 to 16-Jun-2012.
2. Find those customers (customer id) who have purchased alteast 3 vehicles.
3. Display vehicles not purchased so far.
4. Display the vehicles of same type.

5. Display the customers who have birthday today.
6. Display the customers who have purchased 4w on same dates.
7. Display the list of vehicles which is not been sold yet.
8. Display top three costliest vehicles.

Find the customers whose vehicle is not delivered yet.

Week 3,4

FLIGHT(flightId, company_name, flightFrom, flightTo, flightFare, capacity)

PASSENGER(pId, Name,Address, City, BirthDate, Gender, ContactNo)

FLIGHT_SCHEDULED(Transid, flightid, departuredate)

FLIGHT_PASSENGER(Transid, pId)

Passenger Id must start with 'P'.

Flightfare cannot be NULL.

1. Display all the flight details which are flying from 12-Jun-2012 to 15-Jun-2012
2. Display all Air India flights which flied carrying more than 30 passengers.
3. Display total males and females travelling in flightid 101 on 12th June 2012.
4. Display all the passengers with starting with name 'm' and flying to Mumbai.
5. List all the Flights having the same company.
6. Change the Flight Date with is flying from Ahmedabad to Mumbai.
7. Display the flights flying after 3 days from today.
8. Find the age of all passengers.
9. Find the number of male and female passengers.
10. Display the flight details who are not flying today.

STUDENT(rollno,name,class,birthdate)

COURSE(courseno, coursename, max_marks, pass_marks)

SC(rollno,courseno,marks)

1. Add constraint that marks entered are between 0 to 100 only.
2. While creating COURSE table, primary key constraint was forgotten. Add the primary key now.
3. Display details of student where course is 'Data Base Management System'.
4. Select student names who have scored more than 70% in Computer Networks and have not failed in any subject.
5. Select names and class of students whose names begin with 'A' or 'B'.
6. Display average marks obtained by each student.
7. Select all course where passing marks are more than 30% of average maximum marks.
8. Select the course where second and third characters are 'AT'.
9. Display details of students born in 1975 or 1976.

Week 5,6

HOTEL (HNO, NAME (not null), ADDRESS, TOTAL_ROOM)
ROOM (HNO, RNO, RTYPE (not null), LOCATION)
CHARGES (HNO, RTYPE, CHARGES)

1. Create tables using the above schema along with necessary constraints (Primary OR Composite key, foreign key, not null,Uniqueconstraints).
2. Insert four necessary records in each table.
3. Add a column to the ROOM table, which allow us to store STATUS whether the room is occupied or vacant.
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.
5. Sort all hotels in descending order by their address.
6. Display the total number of rooms that are vacant presently.
7. Display the hotel name and address having total rooms > 50.

8. Display the hotel name having the greatest charges on double-seater room.
9. Display hotels, which are totally occupied to its fullest capacity.
10. Create a simple view with HOTEL names and their ADDRESS only.

SALESMAN (SNO, SNAME (not null), CITY, COMMISSION)
CUSTOMER (CNO, CNAME, CITY, RATING, SNO)
ORDER (ONO, AMOUNT, ODATE, CNO, SNO)

1. Create tables using the above table schema along with necessary constraints (Primary OR Composite key, foreign key, not null,Uniqueconstraints).
2. Insert four necessary records in each table.
3. Give all the information about the customers with salesman number S001.
4. List all customers whose names begin with letter 'A' or 'B'.
5. Count the no. Of salesmen currently having orders.
6. Create a copy of your order table. Drop the original order table.
7. Create another table London staff having same structure as salesman table where commission is greater than 2 %.
8. Calculate the total of orders for each day.
9. List all customers and salesmen who shared a same city.
10. Double the commission of all salesmen of London.

Week 7

EMPLOYEE (EMPNO, EMPNAME, STREET, CITY)
COMPANY (COMPANY_NAME, CITY)
WORKS (EMPNO, COMPANY_NAME, SALARY)

1. Create tables using the above table schema along with necessary constraints (Primary OR Composite key, foreign key, not null,Uniqueconstraints).
2. Insert four necessary records in each table.

3. Create a read only view of table Employee where city = "PATANA".
4. Find the name of all employees who live in the same city as the company for which they work
5. Find all employees whose name start with Letter 'P'.
6. Copy all PATNA employees to the table with AHMEDABAD employee.
7. Find the Empno with top three salaries.
8. Sort all the employees with their city and name in descending order.
9. Find employee are from C.G.Road area of city AHMEDABAD and BARODA
10. Find the employees who are not in AHMEDABAD or PATNA.

Week 8

DOCTOR(docId, docName, docSpecialization)

PATIENT(patientId, patientName, patientAddress, patientCity, patientBloodgroup)

TRANS(billNo, billdate, docId, patientId, billAmount)

Apply the following Constraints.

1. docId must start with 'D'.
2. patientName must be in upper case letters.

Implement the following SQL Queries.

1. List the patients with A+ blood group treated by Dr.Ramesh.
2. List out the details of doctors and number of patients they are serving.
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)

STUD_EDU (Stud_Id, Degree Name, Year of Passing, Percentage, Grade)

Implement the following:

A)

1. Display the students whose age is more than 24 years.

2. Display the data of top 3 students in MCA , 2010.

EMPLOYEE (Emp_No, Emp_Name, Basic)

HOLIDAYS (Month, Year, No. of Weekly Off, No. of Holidays)

EMPTRANS (Emp_No, Month, Year, Presence Days, Loan Amount)

Note: 1. HRA is 20% of basic salary

2. DA is 45% of basic salary

2. Medical is 5% of basic salary

3. P.F. is 4% of basic salary

4. Salary is given for (Attendance + Holidays + weekly off) days

Week 11

DEPT_MASTER (Dept_Id, Dept_Name)

COURSE_MASTER (Dept_Id, Course_Id, Course_Name)

STRENGTH_MASTER (Dept_Id, Course_Id, Max_Stud_Allow)

STUD_MASTER (Dept_Id, Course_Id, Stud_No, Stud_Name)

Implement the following:

A)

1. Display the department & course where maximum students registered.

2. Select name, department & course of students whose names begin with 'A'.

Week 12

MOVIE(movie_id, movie_name, date_of_release)

SCREEN (screen_id, location, max_capacity)

CURRENT (movie_id,screen_id, date_of_arrival, date_of_closure)

Note:

Value of screen_id must with letter 'S'.

Screen location can by any one of 'FF', 'SF', and 'TF'.

Date_of_arrival must be less than Date_of_closure.

Max_capacity attribute should have a value greater than 0.

Implement the following:

A)

1. Movie 'Star wars III'was released in the 7th week of 2005. Find out the date of its

release considering that a movie releases only on Friday.

2. Get the details of movie that closed on date 15-January-2010.

Week 13 **PRODUCT (productId, productName, Quantity, ProductPrice)**

SALESMAN(sCode, sName, sAddress, BirthDate, ContactNo)

SALES_ORDER(sCode, productId, qtySold)

Apply the following Constraints.

1. Product price must be less than 500.
2. Salesman Name must be in lowercase and quantity sold must be default 0.

Implement the following SQL Queries.

1. Display the product details whose price is greater than average price of all products.
2. Display the salesman details who have not received any order.
3. Display the salesman details that have got orders of more than 3 distinct products.

Week 14,15 **SUPPLIER** (sid, sname, contactnum)

PARTS(pid, pname, color, unit rate)

CATALOG (sid, pid, qty)

Implement the following:

A)

1. Find those suppliers who haven't ordered any Parts..

2. Create a View that displays the supplier details who have ordered any item having

unit rate greater than Rs.500.

COMPETITION (Comp_code, Comp_name (Dancing, Painting, GK, etc.))

PARTICIPANTS (Part_no, Part_name, DOB, Address, EmailID, Contact_number)

SCOREBOARD (Part_no, Comp_code, Judge_no [1, 2, 3], Marks)

Implement the following:

A)

1. Create a sequence that allows entering new ‘Competition Code’ that must start with ‘CMP’, whenever an insertion is tried to be done.
2. Find the event names which have scored the maximum score by the each judge in total.

Subject: **Discrete Mathematics**								
Program: **Integrated MCA**				Subject Code:**IMCA0203**			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**
04	00	00	04	24/60	00	16/40	00	100

UNIT-I: **[12]**

Pre-requisites

Basic concepts of Sets: different representations of sets, empty set, Universal set, Subsets, power set, union and intersection Complement of a set, difference of two sets, Venn diagrams.

Functions: Definition, identity function, constant function, inverse, one-to-one and onto function.

Relations: Definition, binary, reflexive, symmetric, anti symmetric, transitive, equivalent relations.

Fuzzy sets: Definition, comparison with crisp sets, membership function, operations on fuzzy complement, union and intersection.

UNIT-II **[12]**

Group theory

Algebraic structures, monoid and semigroup – definition and examples only.

Group – definition and examples. Permutation groups, Cyclic and abelian groups, order of a group, subgroup, homomorphism, isomorphism, kernel of a homomorphism, Cosets, Lagrange's Theorem, Normal subgroups, Quotient groups, direct product of groups.

UNIT-III **[12]**

Graph theory

Basic definitions in graph theory,Directed and undirected graphs, paths, reachability and connectedness, matrix representation of graphs, trees.

UNIT-IV **[12]**

Lattices and Boolean Algebra

Lattices: Partial order relation, poset and examples based on it, LUB and GLB of a poset, totally ordered set, chain. Lattice – definition and examples, hasse diagram, lattice as an algebraic system,

Properties of lattice in the form of theorems (without proof) - Isotonicity property, modular inequality, distributive inequality. Sublattice– definition and examples, lattice homomorphism, isomorphic lattices, direct product of lattices, bounds of lattice, complete lattice, bounded lattice, complemented lattice, distributive lattice, De' Morgan's laws(without proof).

Boolean Algebra: Definition and examples, properties of Boolean algebra, join ir-reducible element, atom, Stone's representation theorem (without-proof), Sub Boolean algebra, direct product and Boolean homomorphism, Boolean forms, SOP and POS canonical forms, Boolean functions, Binary valuation process, symmetric Boolean expressions.

Text Book :

1. J. P. Tremblay and R. Manohar, "*Discrete Mathematical structures with Application to Computer Science*", Tata McGraw-Hill.
2. D. S. Malik and M. K. Sen, "*Discrete Mathematical structure*", Cengage Learning

Reference Book:

1. Seymour Lipschutz and Marc Lipson, "*Discrete Mathematics*", (Schaum's Outline Series), McGraw-Hill.
2. T. Veerarajan, *"Discrete Mathematics with Graph Theory and Combinatorics*", McGraw-Hill.
3. K. H. Rosen, "*Discrete Mathematics and its Applications"*,6th edition, Tata McGraw-Hill
4. Bernard Kolmann& others *"Discrete Mathematical structure*", 6th edition,PearsonEduction
5. Edgar G. Goodaire and Michael M. Parmenter, *"Discrete Mathematics with Graph Theory*", PHI.
6. NarsinghDeo, "*Graph Theory with Applications to Engineering and Computer science*"
7. George J. Klir and Bo Yuan, "*Fuzzy sets and Fuzzy Logic"*, PHI.

Subject: **Microprocessor**								
Program: **Integrated MCA**				Subject Code:**IMCA0204**			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**
04	00	00	04	24/60	00	16/40	00	100

UNIT-I **[12]**

Introduction to Microprocessor

16-bit Intel Microprocessor: Von-neumann architecture, Intel-8086, pin description minimum and maximum modes, operating modes, register organization, BIU and EU, interrupts, Real mode memory addressing, Addressing modes

8086 Hardware specifications: 8086 pin-outs and pin functions, Clock generator, Bus buffering and latching, Bus timings, Ready and wait stat, minimum/maximum mode operation, Memory interfacing with 8086, Introduction to basic I/O interface, I/O port address decoding.

UNIT-II **[12]**

Interrupts and Instruction Set of 8086: Segments, flags, Instruction set assembly language programming on 8086 using assembler, interrupts, writing interrupt services routines, debugging programs, storing an interrupt vector in the vector table. Hardware interrupts: INTR and INTA

Instruction Set:

Data movement instructions, Arithmetic and logic instructions, Program control instructions, string instruction, assembly language programming, assembler directives.

UNIT-III **[12]**

Operating modes of 8086: 8086 pin functions, minimum and maximum mode operations, memory banks, multiplexing of buses, clock generation, ready synchronization and reset, synchronization using 8284, 8288 bus controller

UNIT-IV **[12]**

Architecture and basics of 8086 family of Processors: Architecture of 80286,386,486 and Pentium, memory systems, programming models flags, real mode & protected mode operations, virtual 8086 mode paging system. Concepts of RISC, RISC vs. CISC architecture

Text Book :

1. Douglas Hall, "*Microprocessor & Interfacing*", TMH
2. Berry B. Brey, "*The Intel Microprocessor 8086/88, 80186/188, 80286, 80386, 80486, Pentium And Pentium PRO Processor"*, PHI
3. Badri Ram, "*Advanced Microprocessor and Interfacing*"

Reference Book:

1. DenielTaloak, "*Advance Microprocessor",* TMH

Subject: **Principles of Management**								
Program: **Integrated MCA**				Subject Code:**IMCA0205**			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**
04	00	00	04	24/60	00	16/40	00	100

UNIT-I **[12]**

Introduction to Management: Definition, Nature, Types of Managers, Managerial skills and Levels, Basic Functions of Management

Evolution of Management Theory: Scientific Management—F.W. Taylor, Theory of Henry Fayol, Behavioural Model of Management (Hawthorne studies), Modern Theories of Management (Systems Management School, Situational Approach School)

UNIT-II **[12]**

Planning: Definition, Nature, Importance, Types of Planning, Steps in Planning, Decision Making

Organizing: Concept, Definition, Organizational Structure,Delegation of authority, Departmentation

UNIT-III **[12]**

Staffing: Definition- Recruitment, Selection, Placement, Training and development

Leadership:Definition, Leadership Characteristics

UNIT-IV **[12]**

Directing and Controlling:Meaning of Motivation, Meaning of directing & control, Need of Control, Control Process

Text Books

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. L.M.Prasad, " *Principles and Practice of Management",* (2001), 5th Edition, Sultan Chand and Sons
2. Robbins, DeCenzo and Bhattacharyya, "*Essential of Management Pearson Publication"*
3. Koontz, H. and Weihrich, H (1998) & (2001), "*Essentials Of Management",*Edition- 5th and 10th, Tata McGraw Hill: New Delhi

Digital Learning Resource

Articles from Indian Management

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 Computer Application

Teaching Scheme

Subject Code	Subject Name		Teaching Learning			
		Theory Session (Hours)	Tutorial Session (Hours)	Laboratory Session (Hours)	Total (Hours)	Credit
IMCA0301	Database Management System - II	04	00	04	08	06
IMCA0302	Object Oriented Programming using C++	04	00	04	08	06
IMCA0303	System Analysis & Design	04	02	00	06	05
IMCA0304	E-Commerce & M-Commerce	04	00	00	04	04
IMCA0305	Computer Oriented Numerical Methods	04	00	00	04	04
Total		20	02	08	30	25

Subject: **Database Management Systems - II**								
Program: **Integrated MCA**				Subject Code:**IMCA0301**			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**
04	00	04	06	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.

UNIT-IV **[12]**

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

Overview of Oracle architecture.

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

Text books:

1. Abraham Silberschatz, Henry F. Korth, *"Database System Concepts"*, 6th Edition, McGraw Hill Publication.

Reference books:

1. Peter Rob, Carlos Coronel, *"Database Systems, Design, Implementation and Management"*, 7thEdition, Cengage Learning, 2007.
2. S.K. Singh,*"Database Systems, Concepts, Design and Applications"*, Pearson Education
3. Elmsasri, Navathe,*"Fundamentals of Database Systems"*, 5thEdition, Pearson Education, 2008.
4. Ivan Bayross, *"SQL/PLSQL the programming Language of Oracle"*, BPB Publication.
5. Rajshekharsundarraman, *"Oracle 10g Programming"*, Pearson Education
6. Kevin Loney, *"Oracle Database 10g : Complete Reference"*, McGraw Hill Publication.

Practical Lab:

Week	Topic/Subtopic
1,2	1) Write a PL Block using simple FOR loop to insert ten rows into a database table showing numbers odd or even.

Output:

```
NUM_COL1 NUM_COL2  CHAR_COL
-------- --------  ---------
       1       100  i is odd
       2       200  i is even
```

2) Write a PL Block to increase the salary of employees by 10% who are making less than 10000.
3) Write a PL Block to display the current date.
4) Write a PL/Block to find the area of a square and insert into the temp table.
5) Create PL/SQL Block report displaying employee details in proper format.
6) Write a procedure which deletes employee records if salary and commission is less than lowest salary range. (pass parameter as deptno and job)
7) Write a procedure that displays list of students with atleast three hobbies, out of which one should be 'Playing Cricket'
8) Write a function which accepts the name of city & returns the Temperature & Humidity.

9) 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

3,4 **DOCTOR(docId, docName, docSpecialization)**

PATIENT(patientId, patientName, patientAddress, patientCity, Bloodgroup)

TRANS(billNo, billdate, docId, patientId, billAmount)

Apply the following Constraints.

3. docId must start with 'D'.
4. patientName must be in upper case letters.

Create following PL/SQL Blocks.

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.

Report of <patient name>

DATE: <current date>

Blood group : <blood group of patient>

Doctor's Name: <name of doctor>

Amount to pay: <bill amount>

5,6 **STUDENT(Stud_Id, Stud_Name, Address, Date of Birth)**

STUD_EDU (Stud_Id, Degree Name, Year of Passing, Percentage, Grade)

Implement the following:

1.Write a PL/SQL block to display the detail of students who have done MCA.

2. Write a procedure to accept stud-id as input and display its data.

EMPLOYEE (Emp_No, Emp_Name, Basic)

HOLIDAYS (Month, Year, No. of Weekly Off, No. of Holidays)

EMPTRANS (Emp_No, Month, Year, Presence Days, Loan Amount)

1. HRA is 20% of basic salary

2. DA is 45% of basic salary

2. Medical is 5% of basic salary

3. P.F. is 4% of basic salary

4. Salary is given for (Attendance + Holidays + weekly off) days

An organization want to print the pay slips in following format for given Employee

Name, Month & Year.

Month : Issue Date:

Year : Days in Month:

Employee No: Employee Name:

Presence : Holidays : Absence :

Salary Days:

Earnings Deductions

======= ========

Basic **:** P.F. **:**

Medical **:** Loan **:**

H.R.A. **:**Prof. Tax **:** 20 Rs.

D.A. **:**

Total Earning**:**

Total Deduction**:**

7 **DEPT_MASTER (Dept_Id, Dept_Name)**

COURSE_MASTER (Dept_Id, Course_Id, Course_Name)

STRENGTH_MASTER (Dept_Id, Course_Id, Max_Stud_Allow)

STUD_MASTER (Dept_Id, Course_Id, Stud_No, Stud_Name)

Implement the following:

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.

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.

8 **MOVIE(movie_id, movie_name, date_of_release)**

SCREEN (screen_id, location, max_capacity)

CURRENT (movie_id,screen_id, date_of_arrival, date_of_closure)

Note:

Value of screen_id must with letter 'S'.

Screen location can by any one of 'FF', 'SF', and 'TF'.

Date_of_arrival must be less than Date_of_closure.

Max_capacity attribute should have a value greater than 0.

Implement the following:

1. Create a trigger that checks the 'screen_id' must start with 'S' whenever an insertionis tried to be done. Raise a user defined exception if the rule is violated.

2. Create a procedure to print Movie Name where Movie code is been supplied by the user.

9,10 **PRODUCT (productId, productName, Quantity, ProductPrice)**

SALESMAN(sCode, sName, sAddress, BirthDate, ContactNo)

SALES_ORDER(sCode, productId, qtySold)

Implement the following

3. Product price must be less than 500.
4. Salesman Name must be in lowercase and quantity sold must be default 0.

Create following PL/SQL Blocks.

1. Create a SQL/PLSQL Block that displays all the Salesman details and Product details. Display in proper format:

SalesmanNameProductNameQuantitySoldProductPriceTotalPrice

NAMAN PEN 20 4 80

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.

11 **SUPPLIER** (sid, sname, contactnum)

PARTS(pid, pname, color, unit rate)

CATALOG (sid, pid, qty)

Implement the following:

Create a PL/ SQL block to prepare invoice in following format.

Prepare this report Part information wise. Use parameterized cursor.

Part Details :::

Part Id Part Name Quantity (in Hand) Unit Price

Total Parts Available: <Total Count>

COMPETITION (Comp_code, Comp_name (Dancing, Painting, GK, etc.))

PARTICIPANTS(Part_no, Part_name, DOB, Address, EmailID, ontact_number)

SCOREBOARD (Part_no, Comp_code, Judge_no [1, 2, 3], Marks)

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.

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

12 **BOOK(Book_id, Book_title, Publisher, Book_price, edition)**

AUTHOR(Book_id, Author_name, city, gender)

Implement the following:

1. Create the above given tables with all necessary constraints wherever applicable (Primary key, foreign key, unique key, not null and check constraints).
2. After creation of above tables, modify marks table by adding a constraint that gender can be only 'F' and 'M'.

Create following PL/SQL Blocks.

1. Write a procedure which finds the details of books whose price is more than average price.
2. Write a procedure which gives names of authors who havewritten for more than 3 publisher.
3. Write a function which counts total number of books writte by a author for 'Nirav' publisher.(pass author name a parameter)
4. Write a trigger which restrict the record for book price < 50

13 **CUSTOMER (custId, custName, custAddress, custBranch)**

FDDETAIL(fdId, fdPeriod, fdInt)

ACC_CUST_FD_DETAILS(custId, fdId, fdAmount,fdDate)

Apply the following Constraints.

1. custStartDate should be by default a current date.
2. FdAmout should be greater than 5000.

Create following PL/SQL Blocks.

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.

Report for the <customer name>

DATE: <current date>

Branch :< name of branch>

FD Start Date: <start date>

FD End Date:<end date of FD>

FD Maturity value : <Amount calculate as per Rate of Interest >

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)

14 **SUBJECT** (Sub_code, Sub_name)

STUDENT (Roll_no, Stud_Name, Gender, DOB, Address)

RESULT(Roll_No, Sub_code, Marks)

Implement the following:

Create a PL/SQL block to generate the marksheet subject wise according to the following format:

100-90 90-80 80-70 70-60 60-50 <50

Sub Code:

Sub Name:

Total (in each group):

15 **DEPARTMENT (Dept_Id, Dept_Name)**

COURSE (Dept_Id, Course_Id, Course_Name)

STRENGTH (Dept_Id, Course_Id, Max_Stud_Allow)

STUD_DEPT (Dept_Id, Course_Id, Stud_No, Stud_Name)

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.

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,yr_of_release, total_copies)

MEMBER (member_code, member_name,mem_ship_dt)

ISSUE (Issue_id, member_code, book_code, issu_ret, issue_date, ret_dt)

Note:

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.

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.

2. Create a package for the following.

Create a function to print the book title when Book code is been supplied by the user.

Subject: **Object Oriented Programming using C++**								
Program: **Integrated MCA**				Subject Code:**IMCA0302**			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**
04	00	04	06	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++"*, the 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. YashwantKanetkar*"Let Us C++"*,BPB Publications

Practical Lab:

Week	Topic/Subtopic
1	• Write a cpp program to print a hello world in c++. • 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 • 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) • 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. • 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. • 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.
- 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)

  a. Compare two strings for equality (== operator)

  b. Check whether first string is smaller than the second (<= operator)

  c. Copy the string to another

  d. Extract a character from the string (Overload [])

  e. Reverse the string

  f. Concatenate two strings (+ operator)

11
- Write a program to Single inheritance for following structure.
  Student Class (rollno, sub1, sub2) and Result class(total,avg)
  Write a class for Multilevel Inheritance for following structure
  Student class (rollno),Test Class(sub1,sub2), Result Class(total, avg)
- 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.
- 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
- 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 MCA**				Subject Code:**IMCA0303**			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**
04	02	00	05	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:

1. V. Rajaraman, *"Analysis and Design of Information Systems"*, Second Edition, PHI Publication
2. Kandal&Kandal, *"System Analysis & Design"*

3. Elias M. Awad, *"System Analysis and Design"*,2nd Edition, Galgotia Publication.
4. 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 MCA**				Subject Code:**IMCA0304**			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**
04	00	00	04	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 MCA**				Subject Code:**IMCA0305**			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**
04	00	00	04	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 – RungeKutta Method

Text Book(s):

1. E. Balagurusamy, *"Numerical Methods"*, Tata McGraw Hill,1999.
2. V.Rajaraman, *"Computer Oriented Numerical Methods"*, 3rd Edition, Prentice Hall India, New Delhi,1998.

3. S.S. Sastry, *"Introductory Methods of Numerical Analysis"*, 4th ed. PHI,2007.

Reference Books:

1. BullrichStoor, *"Computer Oriented Numerical Methods"*, Springer-Verlag, 1998.
2. E.V.Krishnamurthy, S.K. Sen, *"Computer Based Numerical Algorithms"*, East West Press, 1998.
3. M.K. Jain, S.R.K. Iyengar, R.K. Jain, *"Numerical Methods : Problems and Solutions"*, New Age Int.(P) Ltd., New Delhi, 1997.
4. M.K. Jain, S.R.K. Iyengar, R.K. Jain, *"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 andCommunication Technology

Integrated Master of Computer Application

Teaching Scheme

Subject Code	Subject Name		Teaching Learning			
		Theory Session (Hours)	Tutorial Session (Hours)	Laboratory Session (Hours)	Total (Hours)	Credit
IMCA0401	Data Structure	04	00	04	08	06
IMCA0402	Operating System & Introduction to Unix	04	00	04	08	06
IMCA0403	Fundamentals of Networking	04	02	00	06	05
IMCA0404	Computer Oriented Statistical Methods	04	00	00	04	04
IMCA0405	Fundamentals of Accounting	04	00	00	04	04
Total		20	02	08	30	25

Subject: **Data Structure**								
Program: **Integrated MCA**				Subject Code:**IMCA0401**			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**
04	00	04	06	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"*,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"*, Pearson Education, First Edition Reprint 2003.
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). Description of program: a. Input an array of float. b. Ask position from the user where the new element has to be inserted. c. Insert the element into the array. d. Print the upgraded array.
2	Insert an element at user defined position in an array of type float (sorted). Description of program: a. Input an array of float. b. Search for the position where the new element has to be inserted.

c. Insert the element into the array.
d. Print the upgraded array.

3 Delete an element from user defined position in an array of type float

Description of program:

a. Input an array.
b. Ask element has to be deleted.
c. Search the position of the element.
d. Delete the element.
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.
2. Create a linked list with nodes having information about a student and Delete of a node with the roll number of student specified.
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.
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.
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 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.

2. Convert Infix Expression to Postfix form using Stack.
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.
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.
2. Create a tree without recursion and perform inorder, preorder and postorder traversal on that tree.
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.
2. To implement Merge sort using array as a data structure.
3. To implement Quick sort using array as a data structure.
4. To implement Bubble sort using array as a data structure.
5. To implement Selection sort using array as a data structure.
6. To implement Binary Search using array as a data structure.
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. 2. Implement the insertion in a graph and then traversal in graph using Depth First Search.
15	1. Implement single source shortest path algorithm. 2. Implement all pair shortest path algorithm.

Subject: **Operating System and UNIX**								
Program: **Integrated MCA**				Subject Code:**IMCA0402**			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**
04	00	04	06	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. W. Stalling, *"Operating Systems"*, 6th Edition, Prentice Hall India.
2. Sumitabha Das, *"UNIX Concepts and Applications"*, 3rd Edition TMH

Reference Books:

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

Practical Lab:

Unit	Topic/Subtopic
1	Check the output of the following commands. 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 a) Accept numbers and perform addition, subtraction, division and multiplication. b) Accept the string and checks whether the string is palindrome or not. c) Accept number and check the number is even or odd, finds the length of the number, sum of the digits in the number. d) Accept strings and replace a string by another string. e) Accept filename and displays last modification time if file exists, otherwise display appropriate message. 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.

- 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.
- 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
- 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
- Write a script to implement the following commands:
  Tree (of DOS)
  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

- List directory Make directory
- Change directory Copy a file
- Rename a file Delete a file
- Edit a file

10 Write a script which reads a text file and output the following

Count of character, words and lines.

File in reverse.

Frequency of particular word in the file.

Lower case letter in place of upper case letter

11 Write a Script for Simple Database Management System Operation.

Database File Contains Following Fields.

EMP_NO

EMP_NAME

EMP_ADDRESS

EMP_AGE

EMP_GENDER

EMP_DESIGNATION

EMP_BASIC_SALARY

Provide Menu Driven Facility For

VIEW RECORD BASED ON QUERY

ADD RECORD

DELETE RECORD

MODIFY RECORD.

COUNT TOTAL NUMBER OF RECORDS

EXIT

12 Write A Script To Perform Following String Operations Using

Menu: COMPARE TWO STRINGS.

JOIN TWO STRINGS.

FIND THE LENGTH OF A GIVEN STRING. OCCURRENCE OF CHARACTER AND WORDS E.

REVERSE THE STRING.

13
- Write a script to calculate gross salary for any number of employees Gross Salary =Basic + HRA + DA.

  HRA=10% and DA= 15%.
- 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 MCA**				Subject Code:**IMCA0403**			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**
04	00	02	05	24/60	00	16/40	00	100

UNIT-I **[12]**

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 **[12]**

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 **[12]**

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 **[12]**

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"*, 4th Edition, Pearson Education
2. Wayne Tomasi, *"Introduction to Data Communication and Networking"*, 1/e, Pearson Education.

Digital Learning Resources:

1. http://accessengineeringlibrary.com/browse/data-communications-and-networking-fourth-edition
2. http://www.mheducation.com/highered/product.M0073376221.html

Subject: **Computer Oriented Statistical Methods**								
Program: **Integrated MCA**				Subject Code:**IMCA0404**			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**
04	00	00	04	24/60	0	16/40	0	100

UNIT-I **[12]**

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 **[12]**

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 **[12]**

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 **[12]**

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: Known, Unknown, Determining the Sample Size; Population Proportion

Text Book(s):

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

Reference Books:

1. J.Susan Milton & Jesse Arnold, *"Introduction to Probability & Statistics: Principles &Applicationsfor Engineering & Computing Sciences"*
2. Bharat Jhunjhunwala, *"Business Statistics"*, 1st 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: **Fundamentals of Accounting**								
Program: **Integrated MCA**				Subject Code:**IMCA0405**			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**
04	00	00	04	24/60	0	16/40	0	100

UNIT-I **[12]**

Introduction to accounting: Principle of double entry book keeping: Meaning, Importance & scope of accounting, Accountancy, accounting and book keeping, Distinction between book keeping and accounting, Branches of accounting, Double entry system of accounting, Accrual basic & cash basis of accounting, accounting equation

Generally accepted accounting principles: Meaning of Generally accepted accounting principles, Basic assumptions and principle of accounting

UNIT-II **[12]**

Journalizing, Posting, Balancing and preparation Subsidiary books: Journalizing, Posting, Balancing: Meaning & classification of account, Rules of debit and credit, Meaning and format of journal, Meaning of journalizing, Ledger and its format, Balancing

Subsidiary books: Meaning and types of cash book, Trade and cash discount, Three column cash book, petty cash book, purchase book, sales book, purchase return book & sales return book

UNIT-III **[12]**

Preparation of financial statements: Meaning and utility of financial statements, Recognition of assets, liabilities, income and expense, Preparation of trading, profit & loss account and final balance sheet of trading company, partnership firm and joint stock companies (both horizontal and vertical form) with simple adjustments

UNIT-IV **[12]**

Introduction to cost accounting: Cost accounting: Meaning, objectives, Functions of cost accounting, Brief introduction to elements of cost (including fixed , variable and semi variable cost)

Material cost control: Meaning, Objectives, Classification of material cost, Determination of various levels and Problems on LIFO, FIFO & weighted average

Direct labor cost control: Meaning, Objectives, Classification of the labor cost, Determination of the labor cost by time wage, Piece wage and incentive plans (including Halsey, Rowan plan)

Computerized accounting: Overview of Financial accounting software (Tally, Ex. Microsoft Financial)

Text Book(s):

1. P.C. Tulisan, *"Financial Accounting"*, Pearson Education
   (For unit 1 refer chapter 1, 2 & 5, Unit 2 refer chapter 6, 7 & 8, Unit 3 refer chapter 9)
2. S P Gupta, *"Statistical Methods"*, 30th Edition, S Chand
3. M.Y. Khan &P.K.Jain, *"Cost Accounting"*, Tata Mc. Graw Hill
   (For unit 4 refer chapter 1, 2, 3 & 4)

Reference Books:

1. PrassnaChandra,*"Financial Accounting Theory And Practice"*, Tata Mc. Graw Hill
2. I M Pandey,*"FinancialManagemant"*, Vikas Publishing House
3. Jawaharlal,*"Cost Accounting"*, Tata Mc. Graw Hill
4. S.N. Maheshwari,*"Financial & Cost Accounting"*, Sultanchand& Sons.
5. Dutta, *"Cost Accounting"*, Pearson Education

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 andCommunication Technology

Integrated Master of Computer Application

Teaching Scheme

Subject Code	Subject Name		Teaching Learning			
		Theory Session (Hours)	Tutorial Session (Hours)	Laboratory Session (Hours)	Total (Hours)	Credit
IMCA0501	Fundamentals of Java Programming	04	00	04	08	06
IMCA0502	Software Engineering	04	00	04	08	06
IMCA0503	Client Server Architecture	04	02	00	06	05
IMCA0504	Operation Research	04	00	00	04	04
IMCA0505	Software Project Development-I	00	00	04	04	04
Total		16	02	12	30	25

Subject: **Fundamentals of Java Programming**								
Program: **Integrated MCA**				Subject Code:**IMCA0501**			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**
04	00	04	06	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. HurbertSchildt, *"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:

(Suppose we enter 3 names then output should be as follows):

Number of arguments = 3

1: First Student Name is =Tom

2: Second Student Name is =Dick

3: Third Student Name is =Harry

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 MCA**				Subject Code:**IMCA0502**			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**
04	00	04	06	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 InterfaceDesign, 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"*, 7thEdition, 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 Lab:

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 MCA**				Subject Code:**IMCA0503**			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**
04	02	00	05	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 MCA**				Subject Code:**IMCA0504**			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**
04	00	00	04	24/60	0	16/40	0	100

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 approximationmethod, 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 optimumsolution - 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, MacmillanPublishers 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 MCA**				Subject Code:**IMCA0505**			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**
00	00	04	04	0	24/60	0	16/40	100

Technical Guidelines

I. **COMMUNICATION OF APPROVAL**

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.

II. **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.

III. General Guidelines

- It is recommended that the team should be of 2-3 students.
- Coding standards should be followed meticulously. At the minimum, the code should be self documented, modular, and should use the meaningful naming convention.
- If a student is compelled to follow certain instructions (by the external, i.e. organization's guide) which he/she does not agree to, such a student must prepare a supplementary report to document his/her version and present it to the examiners if such a need arises.
- 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 andCommunication Technology

Integrated Master of Computer Application

Teaching Scheme

Subject Code	Subject Name		Teaching Learning			
		Theory Session (Hours)	Tutorial Session (Hours)	Laboratory Session (Hours)	Total (Hours)	Credit
IMCA0601	.NET Programming using C#	04	00	04	08	06
IMCA0602	Open Source Programming using PHP	04	00	04	08	06
IMCA0603	Software Project Management	03	00	00	03	03
IMCA0604	Software Project Development-II	00	00	10	10	10
Total		11	0	18	29	25

Subject: **.Net Programming using C#**								
Program: **Integrated MCA**				Subject Code:**IMCA0601**			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**
04	00	04	06	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]**

Applicationdevelopment 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, SDI and MDI applications. Master page, Themes, Introduction to CSS, Working with CSS in visual developer.

UNIT-III **[12]**

ASP.NET server controls-Types of control, ASP.NET state management engine, Web.config and global.asax files, Caching, Navigation controls, Validation 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. J. Kanjilal, *"ASP.NET 4.0 programming"*, Tata McGraw-Hill

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: 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 MCA**				Subject Code:**IMCA0602**			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**
04	00	04	06	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]**

Introduction of mySql

MySqlIntroduction: 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. SteverHolzner, *"The complete Reference PHY"*, McGrow Hill

Reference Books:

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

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

Subject: **Software Project Management**								
Program: **Integrated MCA**				Subject Code:**IMCA0603**			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**
03	00	00	03	24/60	0	16/40	0	100

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 Addison Wesley, *"Software Engineering"*

Reference Books:

1. Ian Sommerville Addison Wesley, *"Software Engineering"*
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"*, 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"*, First Impression, Pearson Education.
8. Kathy Schwalbe, *"Project Management in IT"*, Cengage Learning, 2007, Second Indian Reprint 2009.

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 MCA**				Subject Code:**IMCA0604**			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**
00	00	10	10	00	48/120	00	32/80	200

Technical Guidelines

COMMUNICATION OF APPROVAL

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.

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.

General Guidelines

- It is recommended that the team should be of 2-3 students.
- Coding standards should be followed meticulously. At the minimum, the code should be self documented, modular, and should use the meaningful naming convention.
- If a student is compelled to follow certain instructions (by the external, i.e. organization's guide) which he/she does not agree to, such a student must prepare a supplementary report to document his/her version and present it to the examiners if such a need arises.
- 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