

SOURASHTRA COLLEGE

(AUTONOMOUS)

(A Linguistic Minority Co-Educational Institution)

Affiliated to Madurai Kamaraj University

Reaccredited with B Grade by NAAC

Vilachery Main Road, Pasumalai (PO)

MADURAI - 625 004

Vol.II



Syllabi of various Departments presented at

EIGHTH ACADEMIC COUNCIL MEETING

24.03.2017

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UG (I to VI SEMESTER), PG(I to IV SEMESTER)
(Syllabus Under CBCS w.e.f. 2017-18 onwards)

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SOURASHTRA COLLEGE, MADURAI- 625004

(An Autonomous Institution Re-accredited with 'B' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

I SEMESTER(2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|-----------------------|--------------------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 17UACT11/ H11/ S11 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17 UACE11 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17 UCAC11 | Part-III Core | Programming in C | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UCACP1 | Part-III Core | Lab 1 : C Programming | 5 | 3 | 40 | 60 | 100 | 3 |
| 5 | 17UCAA11 | Part-III Allied | Discrete Mathematics | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17UCAS11 | Part-IV SBS | Scripting Language | 3 | 3 | 25 | 75 | 100 | 3 |
| 7 | 14UACVE1 | Part-IV | Value Education | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | TOTAL | 30 | | | | | 22 |

**SOURASHTRA COLLEGE, MADURAI- 625004***(An Autonomous Institution Re-accredited with 'B' grade by NAAC)***BACHELOR OF COMPUTER APPLICATIONS (B.C.A)****(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)**

| | | |
|----------------------------|-------------------------------------|---------------------------------|
| PART - III CORE | Title : PROGRAMMING IN C | Subject Code : 17 UCAC11 |
| Semester : I | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

Enable the students to understand the basic concept of C language

UNIT-I: Overview of C : History of C –Importance of C – Basic structure of C – Programming style – Constants, variables and Data types – Declaration of variables, storage class – defining symbolic constants – declaring a variable as constant , volatile – overflow and underflow of data. Operators and expressions : arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – arithmetic expression – evaluation of expressions – precedence of arithmetic operators – type conversion in expression – operator precedence and associativity-mathematical functions – managing I/O operations : reading and writing a character – formatted input , output.

UNIT-II:

Decision making and branching: if statement, if...else statement – nesting if ... else statement – Else if Ladder – Switch statement – the ?: operator – go to statement.

Control Statements : The While statement – do statement – the for statement – jumps in loops Arrays : one dimensional array – declaration, initialization – two dimensional array – multi dimensional array – dynamic arrays – initialization,

UNIT-III:

Strings: declaration, initialization of string variables – reading and writing string – arithmetic operation on strings-putting strings together – comparison – string handling function – table of strings – features of sting. User Defined functions : need – multi function program – elements of user defined program – definition – return values and their types – function calls, declaration, category- all types of arguments and return values – nesting of functions – recursion – passing arrays – string to functions – scope visibility and life time of variables – multi file programs.

UNIT-IV:

Structures and unions : defining a structure – declaring structure variable – accessing structure members – initialization – copying and comparing – operations on individual members – arrays of structures – arrays within structures – structures within structures – structures and functions – Unions – Size of structures – bit fields.

UNIT-V:

Pointers – accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through it pointer – chain of pointers – pointer expressions – pointer increment and scale factors – pointers and arrays – pointers and character strings – array of pointers – pointers as function arguments – function returning pointers – pointers to functions – pointers and structure. Files : defining, opening, closing a file. I/O operations on files – error handling during I/O operations – random access to file – command line arguments.

TEXT BOOK(S):

1. Programming in ANSC C ,E.Balagurusamy, 4thEdition, Tata McGraw Hill Publishing Company, 2005.
CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap. 1 to 4 ; Unit II – Chap. 5 to 7 ; Unit III – Chap 8 and 9; Unit IV – Chap. 10

Unit V – Chap 11 and 12

REFERENCE BOOKS:

Programming with C (Schaum's outline series), Gotfried, Tata McGraw Hill, 2006

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| | | |
|----------------------------|--|---------------------------------|
| PART - III CORE | Title : Lab 1 : C PROGRAMMING | Subject Code : 17 UCACPI |
| Semester : I | HOURS : 5 hours / Week | CREDITS : 3 |

OBJECTIVES:

Understand the concepts of programming technique and implementing thru C programming

[Two questions to be answered in the Summative practical examination
From 1 to 14 in the list, another one from 15 to 25 in the list]

Lab Cycle

1. To find sum of Digits of a number
2. To reverse given number and check if it is palindrome
3. To evaluate Sine Series
4. To generate the Armstrong Number
5. To find the nth Fibonacci Number
6. To check if a number is Primer Number or not
7. To Sort an Array
8. To count the occurrences of a number in a set
9. To check if a no is Adam Number
10. To reverse a given string and check if it is a palindrome
11. To find Factorial value, Fibonacci, GCD value using Recursion
12. To add and subtract two Matrices
13. To multiply two Matrices
14. To find row wise sum of matrix of order m x n
15. To solve Quadratic Equation – Switch
16. To perform binary search using Function
17. To calculate mean, variance and standard deviation using function
18. To prepare Pay Bill – Structure
19. To prepare Mark Sheet – Structure
20. To perform inventory calculation – Structure
21. To demonstrate the use of bitwise operators
22. To demonstrate the use of sizeof() operator
23. To prepare Mark Sheet – File
24. To prepare EB Bill – File
25. Graphics Programme – only two

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|------------------------------|---|---------------------------------|
| PART - III ALLIED | Title : DISCRETE MATHEMATICS | Subject Code : 17 UCAA11 |
| Semester : I | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

To understand set theory, mathematical logic from the foundation. Graphs are used data structures to develop the various concepts of computer science

UNIT-I:

Set theory: Introduction –sets –subsets- operation on sets-properties of set operation.Relation: Cartesian product of two sets-relation-equivalence relation- closure and warshall's algorithm.

UNIT-II:

Function: function and operators-one to one function- onto function – special type of functions. Mathematical Induction: Technical of proof –Mathematical induction.

UNIT-III:

Matrix Algebra: Introduction-matrix operation- rank of matrixe and elementary operations- simultaneous equations- Eigen values and Eigen vectors.

UNIT-IV:

Logic: Introduction- connectives –truth table of the formula –tautology-tautological implications and equivalence of formula –Replacement process

UNIT-V:

Graph Theory:Basic concepts- matrix representation of graph –trees- spanning trees- shorts path problem.

TEXT BOOK(S):

Discrete Mathematics - Dr. M. Venkatraman, Dr. N.Sridharan& N. Chandrasekara. The National Publishing Company.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit – I Chap. 1.1 to 1.20, 1.35 to 2.39; Unit – II – Chap 2.3 to 3.9, 3.21 to 4.7 ; Unit III – Chap. 6 5.37 to 6.44; Unit IV – Chap 9, 9.4 to 9.10, 9.23 to 9.39; Univ V – Chap 11 – 11.1 to 11.78

REFERENCE BOOKS:

Applied Discrete Structures for Computer Science, alanDoerr& Kenneth levasseur, AsianStudent Edition.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|--------------------------|---------------------------------------|---------------------------------|
| PART - IV SBS | Title : SCRIPTING LANGUAGE | Subject Code : 17 UCAS11 |
| Semester : I | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

Understand the concept of internet and its scripting languages using HTML/Java Script/VB Script

UNIT-I:

HTML: Body and text commands –Basic paragraph text tags – text styles – color values- hyperlinks – images – HTML interactions and enhancements.

UNIT-II:

List-Creating Table-Linking Document-Frames-Graphics to HTML Doc-Style sheet basic- Add style to document-Creating Style sheet Properties-Font-Text-List-Color and background color-Box-Display Properties.

UNIT-III:

Javascript and the Internet-Javascript Language Embedding javascript in HTML- Variables and Literals – Expressions and Operators – Control Statements and Functions-Dialog Box.

UNIT-IV:

Fundamentals of objects-Built in Objects and Functions- Netscape Objects – The Form Object – Windows and Frames - User Defined - Cookies.

UNIT-V:

VB Script-Security and vbscript – vbscript versus visual basic- Host environment-Placing vbscript code within an HTML document – variables – using operators – instrinct operators – intrinsic function. The MsgBox functions – input boxes – controlling the flow controls – passing arguments into procedure – intrinsic HTML – form controls – The button controls.

TEXT BOOK(S):

1. Bob Breedlove et al “WEB PROGRAMMING UNLEASHED”
2. Web Enabled Commerical Application Development Using HTML, DHTML, JavaScript, Perl, CGI – I. Bayross, BPB Publications, 2000 (Unit 2 only)

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

REFERENCE BOOKS:

Glee Harsah Cady and Pat McGregor “Mastering the Internet” BPB 1998
Snell,SamsTeachYourself Internet and Web Basic All in one(SAMS), Perasoneductions.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

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II SEMESTER(2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|--------------------|-------------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 17UACT21 H21/ S21 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE21 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UCAC21 | Part-III Core | Digital Computer Architecture | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UCACP2 | Part-III Core | Lab 2 : Scripting Language | 5 | 3 | 40 | 60 | 100 | 3 |
| 5 | 17UCAA21 | Part-III Allied | Resouce Management Technique | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17 UCAS21 | Part-IV SBS | System Software | 3 | 3 | 25 | 75 | 100 | 3 |
| 7 | 14 UACES1 | Part-IV | Environmental Studies | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | TOTAL | 30 | | | | | 22 |



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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

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| | | |
|----------------------------|--|---------------------------------|
| PART - III CORE | Title : DIGITAL COMPUTER ARCHITECTURE | Subject Code : 17 UCAC21 |
| Semester : II | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

To learn about the basic principle of the system and the system architecture.

UNIT-I:

Gate Networks and Logic Design – Flip-Flops – R-S Flip Flop- D-Flip Flop-K-Flip-Flop-J-K-Master Slave flip-flops – Registers – Parallel-in-Parallel-out-Serial-in-Serial-out-Parallel-in-Serial-out-Serial-in-Parallel-out-Counter-Synchronous Counter-Asynchronous Counters-Adder Design.

UNIT-II:

Processing Unit-Fundamental Concepts: Register Transfers-Performing an Arithmetic or Logic operation- Fetching a Word from Memory-Storing a word in Memory. Execution of a complete Instruction-Multiple Bus Organization-Hardwired control-Micro programmed Control: Micro Instructions – Micro program Sequencing-Wide-Branch Addressing-Microinstructions with Next-Address Field-Pre fetching Microinstructions.

UNIT-III:

I/O Organization-Accessing I/O Devices - Interrupts: Interrupt hardware-Enabling/Disabling interrupts- Handling multiple Devices-Controlling Device Requests. DMA-Buses: Synchronous Bus-Asynchronous Bus-Interface Circuits: Parallel port-Serial port. Standard I/O interfaces: PCI Bus-SCSI Bus-USB.

UNIT-IV:

Memory-Basic Concepts-Semiconductor RAM Memories: Internal organization of Memory chips-Static Memories-Asynchronous/Synchronous DRAMs-Rambus Memory-ROM: PROM-EPROM-EEPROM-Flash Memory-Cache Memories: Mapping Functions-Virtual Memories-Memory Management Requirements.

UNIT-V:

Basic concepts of Pipelining: Role of Cache Memory-Pipeline performance-Data Hazards: Operand Forwarding-Handling Data Hazards in software-Size Effects-Instruction Hazards: Unconditional Branches-Conditional Branches and Branch Prediction-Superscalar Operation: Out-of-order Execution-Execution Completion-Dispatch Operation.

TEXT BOOK(S):

1. Digital Circuits & Design – S.Salivahanan, S.Arivazhagan – Vikas Publishing House Pvt.Ltd.,2002. (Unit 1 only)
2. Computer Organization – V.CarlHamachar, ZronkoG.Vranesic, Software O.Zaky-Tata McGraw Hill Publishers 4th Edition 1996. (Unit 2 to 5)

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit 1 - Text Book 1 : Chap 3.3, 5.3, 5.4,7.3 to 7.6, 7.10, 8.2, 8.9,9.2

Unit 2 to 5 - Text Book 2

Unit 2 – Chap 7 full

Unit 3: Chap 4.1, 4.2,4.4, 4.5 to 4.7

Unit 4 – Chap 5.1 to 5.5, 5.7,5.8

Unit 5: – Chap 8.1 to 8.3, 8.6

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|----------------------------|---|---------------------------------|
| PART - III CORE | Title : LAB 2 : SCRIPTING LANGUAGE | Subject Code : 17 UCACP2 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 3 |

OBJECTIVES:

To learn and practice the basic HTML language thru various tags for web designing

Lab Cycle

- 1 Design a HTML file to demonstrate the various formatting tags.
- 2 Design a HTML file to create an Ordered list with numbering by lowercase roman numerals.
- 3 Design a HTML file to embed the image by image tag with its attribute.
- 4 Design a HTML file to create a class time-table using table tag.
- 5 Design a HTML file to insert a Framed Webpage.
- 6 Design a HTML file to create a Home page of your own using all HTML tags.
- 7 Design a HTML file to navigate from one website to another website.
- 8 Design a CSS file to demonstrate the use of FONT attribute.
- 9 Design a CSS file to align and transform the text.
- 10 Design a CSS file to demonstrate the border and margin attributes.
- 11 Write a VBScript code to simulate the digital clock, based on system time.
- 12 Write a VBScript code to change background color using buttons.
- 13 Write a VBScript code to Swap two numbers using function.
- 14 Write a Java Script code to simulate basic calculator.
- 15 Write a Java Script code to generate the prime numbers.
- 16 Write a Java Script code to demonstrate the native object “math” with any two functions.
- 17 Write a JSP application that validates the Login form.
- 18 Write a JSP application to retrieve the data using Post method.
- 19 Write a ASP application to display date & time using build-in-function.
- 20 Write a ASP application to redirect the request to any other page.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|------------------------------|--|---------------------------------|
| PART - III ALLIED | Title : RESOURCE MANAGEMENT TECHNIQUE | Subject Code : 17 UCAA21 |
| Semester : II | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

To solve application problems like travelling salesman problem, graphical method, least cost method, vogel's approximation method using various tech.

UNIT-I:

Development of OR – Definition of OR-Modeling in OR-general methods for solving OR models-Main characteristics and phases of OR study- Tools and techniques and methods-Scientific methods in OR-Scope of OR.

UNIT-II:

Linear programming problems-Mathematical formulation of L.P.P-Slack and Surplus variables-Graphical solution of L.P.P.

UNIT-III:

Simplex methods- Computational procedure-Artificial variables techniques two phase method-Duality in linear programming.

UNIT-IV:

Mathematical formulation of assignment problem-Method for solving the assignment problems. – Traveling Salesman Problem.

UNIT-V:

Mathematical formulation of transportation problem-Optimal solution of T.P-Methods for obtaining initial feasible solution-Optimal solution-degeneracy in T.P-Unbalanced T.P.

TEXT BOOK(S):

“Resource Management Technique (OR) – New revised edition by Prof. V.Sundaram , K.S.Ganapathysubramanian, K.Ganesan – by A.R.Publications

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap 1, 1.1 to 1.7; Unit -2 , Chap 2, 2.1 to 2.5, 31.1, 31.2 ; Unit II Chap. 3, 31.3, 31.4, 3.2, 3.2.1.

Unit – IV, Chap 8, 8.2 8.3, 8.5 to 8.9 ; Unit – V Chap 7, 7.1.7.53

REFERENCE BOOKS:

Operational Research – S.D.Sharma – KedarNathRamnath& Co. – 1997.

Operational Research – Gupta, Man Mohan, Gandhi Swarup –Sultan Chand Publications.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|--------------------------|------------------------------------|---------------------------------|
| PART - IV SBS | Title : SYSTEM SOFTWARE | Subject Code : 17 UCAS21 |
| Semester : II | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

To learn the major tasks of system software of a computer system and to focus the internal working of hardware & software of a system

UNIT-I:

Introduction - System Software and Machine Architecture –Simplified Instructional Computer: SIC Machine Architecture-SIC/XE Machine Architecture-SIC Programming Examples– Traditional(CISC)machines:VAX Architecture-Pentium Pro Architecture-RISC Machines : UltraSPARC Architecture-PowerPC Architecture-Cray T3E Architecture .

UNIT-II:

Assemblers: Basic assembler Functions:A Simple SIC Assembler-Assembler Algorithm and Data Structures. Machine-Dependent Assembler Features: Instruction Formats and Addressing Modes-Program Relocation.

UNIT-III:

Machine Independent Assemblers Features: Literals-Symbol-Defining Statements-Expressions-Program Blocks-Control Sections and Program Linking. Assembler Design Options: OnePass Assemblers-Multi-Pass Assemblers.

UNIT-IV:

Compilers: Basic Compiler Functions: Grammars-Lexical Analysis-Syntactic Analysis-Code Generation. Machine independent Compilerfeatures: Structured Variables-Machine-Independent Code Optimization-Block Structured Languages.

UNIT-V:

Other System Software: Database Management Systems: Basic Concept of a DBMS-Levels of Data Description-Use of a DBMS- Text Editors: Overview of the Editing Process-User Interface-Editor Structure –Interactive DebuggingSystems: Debugging Functions and Capabilities-Relationship with other parts of the system-User-Interface Criteria

TEXT BOOK(S):

System Software An Introduction to System Programming by Leland L. Beck, Addison –Wesley Publication, 2005

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit 1 – Chap 1, Unit – 2 – Chap 2.1, 2.2 Unit-3 – Chap 2.1 to 2.4 Unit-4 – Chap 5.1, 5.3.1 to 5.3.2, 5.3.4 Unit 5 – Chap 7

REFERENCE BOOKS:

System Programming and Operating System, Dhamdhare,Tata McGraw Hill,

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

III SEMESTER(2016-17 Batch Only)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 14UACT31/ H31/S31 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 14UACE31 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

III SEMESTER(2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 17UACT31/ H31/S31 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE31 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

III SEMESTER(2016-17 batch and 2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|------------------------|--------------------|--|-----------|----------|----|----|-----|-----|
| 3 | 16UCAC31/ 17UCAC31 | Part-III Core | Introduction to Object Oriented Programming with C++ | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 16UCACP3/ 17UCACP3 | Part-III Core | Lab 3 : Object Oriented Programming with C++ | 5 | 3 | 40 | 60 | 100 | 3 |
| 5 | 16UCA31/ 17UCA31 | Part-III Allied | Computer Based Financial Accounting | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | 16UCASP1/ 17 UCASP1 | Part-IV SBS | Lab 4 : DBMS Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | 16UCAN31/ 17UCAN31 | Part-IV NME | Introduction to Information Technology | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | TOTAL | 30 | | | | | 22 |

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SOURASHTRA COLLEGE, MADURAI- 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

| | | |
|----------------------------|---|--|
| PART - III CORE | Title : INTRODUCTION TO OBJECT ORIENTED PROGRAMMING WITH C++ | Subject Code : 17 UCAC31/ 16 UCAC31 |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives :

To understand the basic concepts of OOPS and to implement various functions.

UNIT-I: Software crisis – Software evolution – Basic concepts of object oriented programming- Benefits of OOP – Object oriented languages – Application of C++ - More C++ statements – Structure of C++ program- Creating the source file- Compiling and linking – Tokens –Keywords- Identifiers- Basic data types –User defined data types- Derived data types –symbolic constants – Type compatibility-Declaration of variables- Dynamic initialization of variables-Reference variables- operators in C++ - Manipulator- type cast operator- Expressions and implicit Conversions - Operator overloading – Control Structures – The main function- Function prototyping – Inline function- Function Overloading – Friends and Virtual functions.

UNIT-II: Specifying a class - Defining a member functions – marking an outside function Inline – Nesting of Member functions- Private member functions- Arrays within a class- Memory allocation for object - Static data members- static member function - arrays of objects- Objects as function arguments - Friendly functions–returning objects - const. member functions - pointers to members – Constructors- Parameterized constructor multiple constructors in a class- Constructors with default arguments – dynamic initialization of objects- Copy constructor – Constructing two dimensional arrays – destructors.

UNIT-III: Defining operator overloading- Overloading unary operators – Overloading binary operators – Overloading binary operators using friends – Multiplication of Strings using operators – Rules for overloading operators – Types of conversion – Defining derived classes- Single Inheritance – Making private member inheritable – Multilevel inheritance – Multiple inheritance- Hierarchical inheritance- Hybrid inheritance – Virtual base classes- Constructors in derived classes- member classes- member classes: nesting of classes.

UNIT-IV: Pointer to objects this pointer- pointers to derived classes- virtual functions- Pure Virtual functions- C++ stream classes - Unformatted I/O Operation- Managing output with manipulators.

UNIT-V: Classes for file stream operations- Opening and closing a file – Detecting end of File- more about open() – File modes file pointers and their manipulation – sequential input and output operations- Command line arguments. Templates: Class templates- Function templates – Member function templates – Exception Handling – Syntax of Exception handling code

TEXT BOOK(S):

Object oriented programming with C++ - ByE. Balagurusamy, Tata McGraw Hill Publishing Company Ltd 6th edition.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)Unit I – Chap 1 to 4 Unit II – Chap 5 & 6
Unit III – Chap 7 & 8 Unit IV – Chap 9,10 Unit V – Chap 11 to 13

Passed in the BOS Meeting
held on 15-3-2017

Signature of Chairman / HOD



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(An Autonomous Institution Re-accredited with 'B' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

| | | |
|----------------------------|---|--|
| PART - III CORE | Title : Lab 3 : OBJECT ORIENTED PROGRAMMING WITH C++ | Subject Code : 17UCACP3/ 16UCACP3 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 3 |

Objectives :

To learn and practice the students to know the basic concepts of oops through C++ lang.

Lab Cycle

1. To perform Area calculation using Function overloading (min three functions).
2. To perform string manipulation using function overloading.
3. To demonstrate the concept of friend function.
4. To swap two values between two class objects using friend function.
5. To find minimum of two numbers between two class objects using friend function.
6. To overload unary minus operator which changes sign of given vector (3 elements).
7. To overload Binary + operator which adds two complex numbers.
8. Implementation of mathematical operations on strings { Overload two operators + and <= }
9. To demonstrate single inheritance of a public data member and a private data member
10. To process students mark list using multiple inheritance.
11. To process employee details using hierarchial inheritance.
12. To process inventory details using multilevel inheritance.
13. To process family details using hybrid inheritance
14. To illustrate the use of Virtual base class
15. To process electricity billing using binary file
16. To process mark listing using binary file
17. To implement Searching concept using C++
18. To implement Sorting concept using C++
19. To handle exceptions
20. To illustrate use of class templates
21. To illustrate use of function templates.

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

| | | |
|------------------------------|--|--|
| PART - III ALLIED | Title : COMPUTER BASED FINANCIAL ACCOUNTING | Subject Code : 17UCAA31/ 16UCAA31 |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives :

To learn the basic concept of accounting and concept of tally package.

UNIT-I:

Accounting –Principles, Convention-Journal-ledger- Trial Balance.

UNIT-II:

Preparation of Subsidiary books : sales book - purchase book - purchase return book – sales return book – bills receivable book – bills payable book – cash book.

UNIT-III:

Preparation of Trading, Profit and Loss Accounts, Balance Sheet of Individual only.

UNIT-IV:

Accounting ratios: return on investment - Net profit ratio - gross profit ratio – expense ratio - operating profit ratio – proprietary ratio - debt equity ratio – fixed assets ratio – current ratio – liquidity ratio.

UNIT-V:

Financial Accounting Package (Tally 6.3): Accounts masters-Vouchers entry – Reports printing – Tally Review (features)

TEXT BOOK(S):

1. Advanced Accountancy: R.L. Gupta & RadhaSwamy-Sulthanchand Pub. 2004 (Unit 1 to 3)
2. Management Accounting by Dr. Peer Mohamed, Dr. Shazuli Ibrahim, Pass Pub. (Unit 4)
3. “Implementing Tally 9” Comprehensive guide for Tally 9 & 8.1 by Nadhani

Allotment of marks for External Examination

Note : Theory 50%
Problems 50%

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit I & II (Text Book 1) : Page 1.2.1 to 1.2.16 , 1.6.1 to 1.6.34 ; Unit III (Text Book 1) Page 1.7.1 to 1.7.39; Unit – IV (Text Book 2) Page 3.01 to 3.23 ; Unit-V (Text Book 3) – Page 2-4.1 to 2-4.82. and 2-5.1 to 2-5.11 and 2-15.1 to 2-15.2

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

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| | | |
|--------------------------------|---------------------------------|--|
| PART - IV SBS | Title : Lab 4 : DBMS LAB | Subject Code : 17UCASP1/ 16UCASP1 |
| Semester : III | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives :

To enable the student to handle data thru database application like oracle and sql queries. Know about data definition and data manipulation and structured query language

DBMS LAB CYCLE

- 1.Data definition language programs.
- 2.Data manipulation language programs.
- 3.Data manipulation with arithmetic operations.
- 4.Data manipulation with logical operation.
- 5.Data manipulation with conditional or comparison operations
- 6.Data manipulation with Aggregate functions of number functions.
- 7.Data manipulation with group by operations.
- 8.Data manipulation with set operations.
- 9.Data manipulation with sub-queries operations.
- 10.Data manipulation with join query for two or more table.
- 11.Data manipulation with mathematical functions.
- 12.Data manipulation with character functions.
- 13.Data manipulation with date functions.
- 14.Data manipulation with special operations.
- 15.Data manipulation with STRING OPERATORS
- 16.PL/SQL program for calculating Area of circle.
- 17.PL/SQL program for generate Even Number.
- 18.PL/SQL program for generate Prime Number.
- 19.PL/SQL program for checking an Adam Number.
- 20.PL/SQL program for checking an Number palindrome or Not.

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| | | |
|--------------------------|---|--|
| PART - IV NME | Title : INTRODUCTION TO INFORMATION TECHNOLOGY | Subject Code : 17UCAN31/ 16UCAN31 |
| Semester : III | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives :

To introduce I.T in various platform – knowledge about input and output devices – application program – operating system and internet .

UNIT-I:

Introduction : Information systems – software and data – IT in Business and Industry – IT in the Home and at Play – IT in Education and Training – IT in Entertainment and the Arts – IT in Science , Engineering and Mathematics – Computers in Hiding.

UNIT-II:

The Computer system and Central Processing Unit : Types of Computers – Corporate and Department computers – Desktop and Personal computers – The Anatomy of computer – The Foundation of Modern Information Technology ; Binary numbers, Digital signals, Bits and Bytes – Central Processing unit – Memory.

UNIT-III:

Input and Output : I/O Devices – Keyboards – Inputting Text, Graphics – Pointing Devices – The foundation of Modern Outputs : Pixels and Resolutions, Fonts, Color – Display Screens – Printers. Secondary Storage : The foundation of modern storage ; How data is stored, Storage characteristics – Storage media : Floppy Disk, Hard disk, Drivers, Optical disk – Backing up of data.

UNIT-IV:

Software : Introduction – User Interface – Application programs – Operating systems : Introduction , Types, File management and Utilities – Major Software issues.

UNIT-V:

Internet and World Wide Web : Introduction – The Web – Getting connected to the Web – Browsing the Web – Locating information on the Web – Web multimedia.

TEXT BOOK(S):

Information Technology – The Breaking Wave By Dennis P.Curtain, Kim Foley, KunalSen, Cathlen Morin – Tata MCGraw Hill Publ.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap 2 (Except 2.1, 2.10,2.11) Unit II – Chap 3 (Except 3.7 to 3.9); Unit III – Chap 4 & 5 (Except 4.5,4.12 to 4.15 and 5.6, 5.8,5.9) ; Unit IV – Chap 6 (Except 6.8,6.10,6.11) ; Unit V – Chap 1 (Except 1.7)

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

IV SEMESTER(2016-17 Batch Only)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 14UACT41/ H41/S41 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 14UACE41 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

IV SEMESTER(2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 17UACT41/ H41/S41 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE41 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

IV SEMESTER(2016-17 batch and 2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|-----------|--------------------|--|-----------|----------|----|----|-----|-----|
| 3 | 17UCAC41 | Part-III Core | Programming in Java | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UCACP4 | Part-III Core | Lab 5 : Programming in Java | 5 | 3 | 40 | 60 | 100 | 3 |
| 5 | 17UCAAA41 | Part-III Allied | Numerical Methods | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17 UCASP2 | Part-IV SBS | Lab 6 : Computer Graphics & Multimedia Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | 17UCAN41 | Part-IV NME | Web Programming | 2 | 3 | 25 | 75 | 100 | 2 |
| 8 | | Part-V | Extension Activities | | 3 | 25 | 75 | 100 | 1 |
| | | | TOTAL | 30 | | | | | 23 |



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| | | |
|----------------------------|------------------------------------|---|
| PART - III CORE | Title : Programming in Java | Subject Code : 17UCAC41/16UCAC41 |
| Semester : IV | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives :

To learn how to develop the programming code for various applications by various concepts

UNIT-I:Fundamentals of Object-Oriented Programming : Introduction –OOP Paradigm – Basic concepts of OOP – Benefits of OOP – Applications of OOP - Java Evolution : Java features –Differs from C and C++ - Java and Internet – Java Environment.

UNIT-II:Overview of Java Language : Introduction – Simple Java Program – Java Program Structure – Tokens – Statements – Implementation – JVM – Command Line Arguments - Constants, Variables and Data Types.

UNIT-III:Operators and Expressions – Decision Making and Branching – Decision Making and Looping : Introduction – The while Statement – The Do Statement – The For Statement – Classes, Objects and Methods: Introduction – Defining a Class – Fields Declaration – Methods Declaration - Creating Objects – Accessing Class Members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance: Extending a class – Overriding Methods - Arrays, Strings: Introduction – One –dimensional Arrays – Creating an Array – Two-dimensional Arrays – Strings.

UNIT-IV:Managing Errors and Exception : Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions - Interfaces : Multiple Inheritance: Introduction – Defining Interfaces – Extending Interfaces – Implementing Interfaces - Packages : Putting Classes Together : Introduction – Java API Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a class to a package .

UNIT-V:Multithreaded Programming : Introduction – Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread priority – Synchronization – Implementing the Runnable Interface – Inter-thread Communication –Applet Programming : Introduction – How Applets Differ from Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle - Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML File – Running the Applet - More About Applet Tag – Passing Parameters to Applets - Aligning the Display – More About HTML Tags – Displaying Numerical Values – Getting Input from the User - Event Handling - Summary Managing Input/Output Files in Java :Introduction – Concept of Streams – Stream Classes - Character Stream Classes – Using Streams - Creation of Files – Reading/Writing Characters – Reading/Writing Bytes

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Signature of Chairman / HOD



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TEXT BOOK(S):

Programming with Java – A primer – 4th Edition -E. Balagurusamy, Tata McGraw-Hill, New Delhi.

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit I – Chap 1,2 Unit II – Chap 3,4 Unit – III – Chap 5,6,7 ; Unit IV – Chap 13 ; Unit V – Chap 12,14,16

REFERENCE BOOKS:

The Complete Reference Java 2 , Patrick Naughton, Herbert Scheldt, Tata McGraw Hill, fifth edition, 2006.

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| | | |
|----------------------------|---|--|
| PART - III CORE | Title : Lab 5: PROGRAMMING IN JAVA | Subject Code : 17UCACP4/ 16UCACP4 |
| Semester : IV | HOURS : 5 hours / Week | CREDITS : 3 |

Objectives : To develop various programming code for different applications using java concepts

Lab cycle

1. To perform addition of complex numbers using class and objects.
2. To perform multiplication of matrices using class and objects.
3. To perform volume calculation using method overloading
4. Using command line arguments, test if the given string is palindrome or not
5. Using multilevel inheritance process student marks
6. Implement multiple inheritance for payroll processing
7. Package Illustration
8. To Illustrate built-in exceptions(any four)
9. To illustrate user defined exceptions(at least four)
10. To create multiple threads
 - a) Using thread class
 - b) Using Runnable interface
11. String manipulation using string methods
12. File- byte stream
13. File – character stream
14. Applet – Graphical methods
15. Applet – threads
16. Implementing JDBC

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| | | |
|------------------------------|--------------------------------------|--|
| PART - III ALLIED | Title : NUMERICAL METHODS | Subject Code : 17 UCAA41/ 16 UCAA41 |
| Semester : IV | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives :

To solve various application problems like iteration method , newton raphson method, trapezoidal rule etc. in computers

UNIT-I:

Algebraic and Transcendental equations : Errors in Numerical computation – Iteration method – bisection method – Regular falsi method – Newton Raphson Method

UNIT-II:

Simulation equation : Gauss Elimination method – calculation of inverse of matrix – Gauss seidal method. Curve fitting method of least squares

UNIT-III:

Interpolation : Newton's interpolation formula – central differences interpolation formula – lagrange's interpolation formula – Inverse interpolation

UNIT-IV:

Numerical Differentiation : Newton's forward and back ward difference formula – Numerical Integration : Trapezoidal rule – simpson's rule. Eigen values and eigen vectors of a matrix

UNIT-V:

Numerical solution of differential Equation : Euler's method- Taylor's series method – Range kutta method

TEXT BOOK(S):

S. Arumugam and A.Thangapandiissac , A. Soma sundaram "Numerical methods" , Scitech publication Chennai 2002"

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit I – Chap 3 , 3.0 to 3.5 ; Unit – II – Chap 4, 4.3 and 4.5 , 4.8 ; Unit –III Chap 7, 7.1 to 7.3 and 7.6 ; Unit – IV Chap 8, 8.1, 8.2, 8.5, 5.0 to 5.2 ; Unit – V – Chap 10, 10.1 to 10.4

REFERENCE BOOKS:

- 1) Numerical methods T.Veerajan and J.Ramchandran 2nd edition Tata MC raw Hill 2006.

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| | | |
|--------------------------|---|--|
| PART - IV SBS | Title : Lab 6 : COMPUTER GRAPHICS & MULTIMEDIA | Subject Code : 17 UCASP2/ 16 UCASP2 |
| Semester : IV | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives :

To learn about the basic drawing concepts

To learn about different algorithm used in graphics system

To learn about Multimedia concept using various software

Computer Graphics

1. DDA Line Drawing Algorithm.
2. Bresenham's Line Drawing Algorithm.
3. Bresenham's Circle Drawing Algorithm.

MULTIMEDIA (Flash/Photoshop/Premier/3d Studio Max)

1. Creating a sample image
2. Editing existing image's brightness, mode color and add and edit layer style.
3. Stitch and edit two images into single image. Use selection tools Lasso tool, Clone stamp.
4. Study about time line concepts. Insert text, image. Use scaling rotation alignment.
5. Study Masking concepts. Use audio in the movie.
6. Add buttons, menus, actions to the movie.
7. Export movie .Use multiple scenes.
8. Insert text, image, sprite to the movie.
9. Add effects to the text (predefined and user defined)



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| | | |
|--------------------------|------------------------------------|--|
| PART - IV NME | Title : WEB PROGRAMMING | Subject Code : 17 UCAN41/ 16 UCAN41 |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives :

To understand the concept of web page designing using tags

UNIT-I:

Overview of HTML-structure of a html program-HEAD tag-BODY tag-paragraph tag-formatting tag- (Bold-underline-italic-strike thru-superscript-subscript)

UNIT-II:

LISTS-Ordered list and unordered list-marquee tag-break tag-ruler tag-foot tag-data definition tag.

UNIT-III:

TABLES-TABLE building tags and attributes of table-table tag-table header tag-table row tag-table data tag-row span-column span.

UNIT-IV:

LINKS-linking pages using anchor tag-attributes of anchor tag-image tag and its attributes-frame tag.

UNIT-V:

FORMS-Form tag-input tag-types-text,radio,button,check,password-sample webpage creation.

TEXT BOOK(S):

HTML COMPLETE-BPB publications-2nd edition

CHAPTERS and SECTIONS:

Unit I : Chap 3 Unit II: Page No. 817 to 821,718,719,735,736, 746 to 748, 757,837 to 839 and 915 to 917 Unit III : Chap 7 Unit IV : Chap 5, Chap 8(Page No. 266 to 277), Chap 4 (P.No. 129 to 140) Unit V : Chap 11



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V SEMESTER(2016-17 batch and 2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|------------------------|----------------------|--|-----------|----------|----|----|-----|-----|
| 1 | 16UCAC51/ 17UCAC51 | Part-III Core | Visual Programming | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 16UCACP5/ 17UCACP5 | Part-III Core | Lab 7 : Visual Programming Lab | 5 | 3 | 60 | 40 | 100 | 4 |
| 3 | 16UCAC52 / 17UCAC52 | Part-III Core | Data Structure & Computer Algorithms | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 16UCACP6/ 17UCACP6 | Part-III Core | Lab 8 : Data Structure & Computer Algorithms Lab | 5 | 3 | 60 | 40 | 100 | 4 |
| 5 | 16UCAC53/ 17UCAC53 | Part-III Core | Operating System | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 16UCAE51/ 17UCAE51 | Part-III Elective | Multimedia and Its Applications* | 5 | 3 | 25 | 75 | 100 | 5 |
| | 16UCAE52/ 17UCAE52 | | Mobile Computing* | | | | | | |
| 7 | 16USSS51 | Self Study | Soft Skills | | | | | 100 | 0 |
| | | | TOTAL | 30 | | | | | 25 |

*One elective paper has to be chosen out of two electives



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| | | |
|----------------------------|---------------------------------------|--|
| PART - III CORE | Title : VISUAL PROGRAMMING | Subject Code : 17UCAC51/ 16UCAC51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives :

To learn the programming using visual basic concept and integrated development environment

UNIT-I: Starting a new project- the properties of window-Common form properties-Scale properties –color properties-Making a form responsive-Printing a visual-representation of a form – typos-creating stand alone windows programs-the toolbox-Creating controls- the name (control name)property-Properties of common buttons-simple event procedures for command buttons-access keys-Image controls- Text Boxes-labels-Navigating between controls- Message- boxes-The grid –The ASCII-representation of forms.

UNIT-II: Statements in Visual Basic –Variables-Setting properties with code-Data types-Working with variables-more on strings- More on numbers- constants-Input boxes-Displaying information on a form-The format function-Picture boxes-Rich text Boxes-The Printer Object-Determination loops-indeterminate loops-Making decisions –Select case- Nested IF-Then's- The Go To String functions- Numeric functions- Date & Time functions- financial-functions.

UNIT-III: Function procedures-sub procedures-advanced uses of procedures and functions-Using the object Browser to navigate among your subprograms-List: One-dimensional arrays-Arrays with more than one dimension-Using Lists and array with functions and procedures-The new array-based string-records(User-Defined types).

UNIT-IV: The with statements-Enums-Control arrays-List and Combo Boxes-The Flex grid control-code Modules: Global Procedures-The Do Events Function and sub main Accessing windows function-Error Trapping, Creating and Object in visual Basic-Building your own classes.

UNIT-V: Fundamentals of graphics –Screen scales- The line and shape controls-Graphics via code-Lines and Boxes-Circles, Ellipses and Pie charts. The mouse event procedures-Dragging and dropping operations-File commands-Sequential files- Random access files-Binary files- File system controls-The File system objects-The clipboard-Running another window program from within.

TEXT BOOK(S):

“VISUAL BASIC 6 from the GROUND UP”, Gray Cornell, Tata McGraw Hill Edition 1999.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap 3,4 Unit II – Chap 5 to 8 Unit III – Chap 9,10 Unit IV – Chap 11,13 Unit – V
Chap 16, to 20

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| | | |
|----------------------------|---|--|
| PART - III CORE | Title : Lab 7 : VISUAL PROGRAMMING LAB | Subject Code : 17UCACP5/ 16UCACP5 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives :

To develop programming code for various applications using various tools in VB – handling event management – sub procedures and function procedures

LAB CYCLE

1. Program to design a digital Clock
2. Object type questionnaire.
3. Program to vary color palette.
4. Program to show picture animation.
5. Program to create a file open dialogue to load a picture.
6. Program to design a arithmetic calculator.
7. Program to create a mouse down event program
8. Menu Creation with simple file and edit operation.
9. Sequential file reading and writing.
10. Process students' Mark list using data control
11. Process library maintenance using data control
12. Process telephone billing using data control
13. Process stock inventory using data control
14. Program using DAO to create a simple Address Book
15. Program using DAO to create simple Hotel Reservation form software with examples transactions such as reservation, check in and logout.
16. Develop a system for Library Management using ADO.
17. Develop simple Student Information System using ADO connections.
18. Program for supermarket billing using sequential File.
19. Program for stock Maintenance System using Random Access File.
20. Design a Data Report for Students marks details.
21. Design a Data Report for Employee Pay Bill.
22. Program using ADO for managing Telephone Directory.



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| PART - III CORE | Title : DATA STRUCTURES & COMPUTER ALGORITHMS | Subject Code : 17UCAC52/ 16UCAC52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To implement variety of basic data structure and understand the different solution.

UNIT-I:Introduction and Overview : Introduction – Basic terminology; Elementary Data Organization-Data Structures – Data Structure operations **Arrays and Records :** Introduction – Linear arrays-Representation of Linear arrays in Memory –Traversing Linear Arrays – Inserting and Deleting- Sorting : Bubble sort-Searching : Linear search –Binary Search –Multidimensional arrays.

UNIT-II:Linked Lists: Introduction- Linked Lists –Representation of Linked Lists in Memory – Traversing a Linked List- Searching a Linked List- Memory Allocation; Garbage Collection-Insertion into a Linked List- Deletion from a Linked List- Header Linked Lists

Stacks and Queues : Introduction –Stacks- Array Representation of Stacks-Linked Representation of Stacks-Arithmetic Expressions: Polish Notation-Quick sort, Application of Stacks

UNIT-III:Trees: Introduction- Binary Trees – Representing Binary Trees in memory - Traversing Binary Trees- Traversal Algorithms using stacks –Header Nodes : Threads-Binary Search Trees- Searching and Inserting in Binary Search Tree

UNIT-IV:Sorting and Searching : Introduction – Sorting – Insertion sort – Selection Sort – Merging – Merge Sort – Radix Sort

Graphs and their applications : Introduction – Graph Theory Terminology – Traversing a Graph

UNIT-V:Divide and conquer: The general method-finding the maximum and minimum-Greedy method: The general method-Knapsack Problem-Minimum spanning tree-single source shortest paths.

Dynamic Programming: The general method-Multistage graphs-all pairs shortest paths-Optimal binary search trees-the travelling salesman problem

TEXT BOOK(S):

1. Data Structures – Seymour Lipschutz- Schaum's outlines, The McGraw-Hill (Unit I to Unit IV)
2. Fundamentals of Computer algorithms-Ellis Horowitz, Sartaj Sahni, Galgotia Publications Pvt. Ltd. New Delhi. (Unit – V)

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap 1. 1.1 to 1.4 , 4.1 to 4.9 ; Unit –II Chap: 5.1 to 5.9, 6.1 to 6.6 ; Unit 3- Chap. 7.1 to 7.8;

Unit 4 Chap 9.1. to 9.7, 8.1, 8.2, 8.7

Unit V : Chap 3 – 3.1, 3.4,4.1,4.3,4.6, 4.9,5.1 to 5.3, 5.5 and 5.9

REFERENCE BOOKS:

Data structure and Algorithm Analysis in C-Mark Allen Weiss-Second edition-Addison Wesley publishing company 1997.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

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| PART - III CORE | Title : Lab 8: DATA STRUCTURES & COMPUTER ALGORITHMS | Subject Code : 17 UCACP6/ 16 UCACP6 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

Implementation of Data Structures Concept using C++ Language

Lab Cycle

1. Write a c++ program to perform stack operation using arrays.
2. Write a c++ program to perform stack operation using pointers.
3. Write a c++ program to perform queue operation using arrays.
4. Write a c++ program to perform queue operation using pointers.
5. Write a c++ program to implement singly linked list.
6. Write a c++ program to implement doubly linked list.
7. Write a c++ program to perform linear search.
8. Write a c++ program to perform binary search.
9. Write a c++ program to perform insertion sort.
10. Write a c++ program to perform selection sort.
11. Write a c++ program to perform shell sort .
12. Write a c++ program to perform quick sort.
13. Write a c++ program to perform bubblesort .
14. Write a c++ program to perform merge sort.
15. Write a c++ program to convert infix to postfix expression.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

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| PART - III CORE | Title : OPERATING SYSTEM | Subject Code : 17 UCAC53/ 16 UCAC53 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To learn various interface functions between hardware and system and to know various system like files and memory system in computer

UNIT-I: Introduction – Definition- Mainframe. Multiprocessor. Distributed, Clustered, Real-time, Handheld systems- I/O and storage structure – Hardware protected- Network structure – System Components- System Services. Calls, Programs, structure- System Design, Implementation and generation.

UNIT-II: Process Management: Process concepts, Scheduling, operations- operating processes- Inter-process communication in Client-Server systems- Multithreading models and issues – Windows 2000 and Java threads- CPU scheduling criteria and algorithms – Multi-processor and Real-time scheduling- Algorithm Evaluation – Process scheduling in Windows 2000.

UNIT-III: Process Synchronization – Critical-section problem- Synchronization Hardware- Semaphores – Classic problems- Critical Regions- monitor-synchronization in windows 2000- Deadlock characterization, Prevention, Avoidance and Detection- Recovery from Deadlock.

UNIT-IV: Storage management: Swapping – Contiguous memory allocation- Paging- Segmentation- Segmentation with paging- Demand paging- Process creation – Page replacement- Allocation of Frames- Thrashing- Implementation of Virtual memory in Windows NT- File Concepts and Access methods- directory Structure & implementation- Allocation methods- Free space management.

UNIT-V: I/O Systems and Case Study: Disk structure, Scheduling and Management- Swap Space Management – Case Study: Windows 2000.

TEXT BOOK(S):

Operating system Concepts- Silberschatz A. Galvin P.B., Gagne G- Sixth Edition, 2002, John Wiley & sons.

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit I – Chap 1,2,3 (Except 1.3,2.1,3.6) Unit II – Chap 4,5,6 Unit III – Chap 7,8 (Except 7.1,7.9, 8.1,8.3) Unit IV – Chap 9,10 Unit V – Chap 14 (14.1 to 14.4)

REFERENCE BOOKS:

Operating system Concepts and Design, Milan Milankovic, Tata McGraw Hill, 1997.



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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

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| PART - III ELECTIVE | Title : MULTIMEDIA AND ITS APPLICATIONS | Subject Code : 17UCAE51/ 16UCAE51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives :

To learn many graphical applications and animation by implementing the graphical and multimedia software

UNIT-I:

Introduction-Branch overlapping Aspects of Multimedia Content –Global Structure - Multimedia Literature. Multimedia- Media and Data Streams- Medium.

UNIT-II:

Sound/Audio: Basic Sound Concepts-Music- Speech, Images and Graphics: Basic Concepts:-Computer Image Processing- Video and Animation: Basic Concepts – Television – Computer Based Animation.

UNIT-III:

Data Compression: Storage Space –Coding Requirements –JPEG- MPEG-DVI, Optical Storage Media; Computer Technology –Multimedia Operating System.

UNIT-IV:

Networking System: Layers, Protocols and Services, Networks, Metropolitan Area Networks, WAN, Multimedia Communication System.

UNIT-V:

User Interfaces, Synchronization, Abstraction for Programming: Abstraction Levels-Libraries-System Software-Toolkit-Higher Programming Languages. Multimedia Application: Introduction - Media Population – Media Communication –Trends.

TEXT BOOK(S):

1.Ralf Steinmetz &KlaraNahrstedt – “Multimedia Computing, Communication & Applications”, Pearson Education.

CHAPTERS and SECTIONS :Unit I : Chap 1.1 to 1.4, 2.1 Unit II: Chap. 3.1 to 3.3, 4.1 to 4.2 and 5.1 to 5.3 Unit III: Chap 6.1 to 6.2, 6.5,6.7,6.8 and Chap 9. Unit IV : Chap. 10.1. To 10.2, 10.4 to 10.5 and Chap 11. Unit V : Chap. 14,15, 16.1 to 16.5, 17.1,17.2,17.5 and 17.8

REFERENCE BOOKS:

1. Fred t, Hofstetter – “ Multimedia Literacy” – 3rd edition TMH.

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

| | | |
|--------------------------------------|---|--|
| PART - III Elective | Title : MOBILE COMPUTING | Subject Code : 17UCAE52/ 16UCAE52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives :

To learn about the various mobile devices, internet protocols and formats, embedded control, voice and connectivity

UNIT-I:

Information Access Devices –Handheld Computers –Palm OS –Based Devices- Windows CE –Based Handheld Computers –EPOC Based Handheld Computers –Sub notebooks –Phones –Cellular Phones –Data transmission capabilities –Smart Phones –Screen phones

UNIT-II:

Smart Identification-Smart cards –smart labels –smart Tokens –**Embedded Controls**- Smart sensors and Actuators –Smart Appliances-Appliances and home networking –Automotive computing

UNIT-III:

Internet Protocols and Formats –HTTP- HTML-XML-Xforms-**Mobile Internet**-WAP
1.1 Architecture –Wireless Application Environment 1.1 –WAP 2.0 Architecture –i-node

UNIT-IV:

Voice –Voice Technology Trends –Voice on the web –Standardization.

UNIT-V:

Connectivity-Wireless Wide Area Networks –Short Range Wireless Communication

TEXT BOOK(S):

Principles of Mobile Computing –UweHansmann, LotharMerk, Martin S.Nicklous, Thomas Stober –Springer –Second Edition -2003

CHAPTERS and SECTIONS:

UNIT-I : Chap. 2.1 to 2.10 Unit II : Chap 3.1 to 3.3 and 4.1 to 4. Unit III: Chap 10.1 to 10.4, 11.1 to 11.4 Unit IV : Chap 12.1 to 12.3 Univ V : Chap 14.1 to 14.2

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

VI SEMESTER(2016-17 batch and 2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|-----------------------|----------------------|--|----------|----------|----|----|-----|-----|
| 1 | 16UCAC61/ 17UCAC61 | Part-III Core | Software Engineering | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 16UCAC62/ 17UCAC62 | Part-III Core | Computer Networks | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 16UCAC63/ 17UCAC63 | Part-III Core | Principles of Information Security | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 16UCACP7/ 17UCACP7 | Part-III Core | Lab 9 : Dot Net Programming Lab (VB/ASP) | 5 | 3 | 60 | 40 | 100 | 4 |
| 5 | 16UCAE61/ 17UCAE61 | Part-III Elective | Data Mining* | 5 | 3 | 25 | 75 | 100 | 5 |
| | 16UCAE62/ 17UCAE62 | | Unix & Shell Programming* | | | | | | |
| 6 | 16UCAEV1/ 17UCAEV1 | Part-III Elective | Project Work & Viva-Voce | 5 | 3 | 25 | 75 | 100 | 5 |
| 7 | 16UGKB61 | Self Study | General Knowledge | | | | | 100 | 0 |
| | | | TOTAL | 30 | | | | | 26 |

***One elective paper has to be chosen out of two electives**



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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

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| | | |
|----------------------------|-------------------------------------|---|
| PART - III CORE | Title : Software Engineering | Subject Code :17 UCAC61/ 16 UCAC61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To understand the basic concept of software development environment with various models and techniques and gaining knowledge about maintenance activity

UNIT-I:

Introduction to software Engineering Some definition- Some size factors-Quality and productivity factors-Manual issue.

Planning a software Project : Defining the problem –Developing a solution strategy –planning the development process-Planning an organizational structure –other planning activities

UNIT-II:

Software cost Estimation: Software –Cost Factors –Software cost estimation techniques – Staffing level estimation –estimating software maintenance costs.

UNIT-III:

Software requirements definition: The software requirements specification – Formal specification techniques - Formal languages and processors for requirements specification (Except RSL/REVS).

UNIT-IV:

Software Design : Fundamental Design Concepts –Modules and modularizing Criteria –Design Techniques –Detailed Design Consideration –Real time and Distributed System design –Test Plan –Mile Stones walk through and inspection –Design guide lines

UNIT-V:

Verification and validation techniques: Quality assurance –Static Analysis –Symbolic Execution - Unit Testing and Debugging -System testing –Formal verification.

Software Maintenance : Enhancing maintainability during development –Managerial aspects of software maintenance –Configuration management –source code metrics-other maintenance tools and techniques.

TEXT BOOK(S):

Software Engineering Concepts , Richard E. Fairly. Tata McGraw -Hill book Company, 2005.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap. 1 and 2 Unit – 2 Chap 3; Unit – 3 Chap 4; Unit IV – Chap 5; Unit V-Chap. 8 & 9

REFERENCE BOOKS:

Software Engineering, Jawadekar, Tata McGraw-Hill book Company,2004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

| | | |
|----------------------------|--------------------------------------|---|
| PART - III CORE | Title : COMPUTER NETWORKS | Subject Code :17UCAC62/ 16UCAC62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

Study about the computer networks, applications, topology, layers, sharing, types of networks, DNS, E-Mail

UNIT-I:

Introduction : Uses of computer Networks –Network Hardware –Network Software – Reference Models –Example Networks.

UNIT-II:

The Physical Layer: Guided Transmission Media –Wireless Transmission-Communication Satellites –Mobile telephone System.

UNIT-III:

The Data Link Layer : Data Link Layer Design Issue –Error Detection and Correction – Elementary Data Link Protocols –Sliding Window Protocols-The Channel Allocation Problem – Multiple Access Protocols –ALOHA, CSMA, Collision free protocols.

UNIT-IV:

The Network Layer: Network Layer Design Issues-Routing Algorithms –Shortest path, Flooding , Hierarchical and Broadcast. The Transport Layer: The Transport Service Elements of Transport Protocols.

UNIT-V:

The Application Layer : DNS- The Domain Name System –Electronic Mail –The World Wide Web – Multimedia.

TEXT BOOK(S):

Computer Networks by Andrew S. Tanenbaum 4th Edition, Prentice Hall of India ,2006.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chap 1.1 to 1.5 Unit –II – Chap 2.1 to 2.4 & 2.7 Unit III – Chap 3.1 to 3.4 & 4.1,4.2.1 to 4.2.3 Unit IV – Chap 5.1, 5.2.2, 5.2.3, 5.2.6, 5.2.7, 7.6.1 & 6.2 Unit – V – Chap 7.1 to 7. 3

REFERENCE BOOKS:

Data Communications and Networking, Forouzan, Tata McGraw Hill,2003.

Data and Computer Communications, William Stallings, Pearson education,7th edition, 2003

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

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|----------------------------|---|--|
| PART - III CORE | Title : PRINCIPLES OF INFORMATION SECURITY | Subject Code :17UCAC63/16UCAC63 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To learn the requirements of information security for the safe utilization and storage of information in a system

UNIT-I:

Information Security:

History of Information Security – What is Security – Components of Information System - Security System Development Life Cycle – Security Professionals and the Organization – Communities of Interest – Information Security Is it an Art or Science.

UNIT-II:

Why Security is Needed :

Business Needs First – **Threats:** Deliberate Software Attacks : Virus,Worms,Trojan Horses – Deviations in Quality of Services – Forces of Natures – Human Error or Failure – Thefts – Technical Hardware Failure or Errors – Technical Software Failure or Errors. **Attacks:** Malicious Code , Hoaxes , Backdoors , Password Check , Denial of Service , Spoofing , Spam , Mail bombing , Timing Attack.

UNIT-III:

Managing IT Risk:

Overview of Risk Management – **Risk Identification** : Plan and Organize the Process , Asset Identification and Inventory , Information Asset Valuation – **Risk Control Strategies:** Defend , Transfer ,Mitigate , Accept , Terminate – **Selecting Risk Control Strategy:** Feasibility Studies , Cost Benefit Analysis (CBA), Evaluation,Assessment and Maintenance of Risk Control

UNIT-IV:

Plan for Security: Information Security , Planning and Governance – Information Security Policy , Standards and Practices : Definition,EISP , ISSP – Security Education , Training and Awareness Program – Continuity Strategies : Business Impact Analysis , Incident Response Planning.**Security Technology : Access Control** – Identification, Authentication , Authorization , Accountability

UNIT-V:

Security Technology : Firewalls – Firewall Processing Modes , Firewall Categorized by Generation , Firewall Categorized by Structure , Remote Access , VPN **Scanning And Analysis Tools :Port Scanner** , Firewall Analysis Tools , Operating SystemDetection Tools , Vulnerability Scanners , Packet Sniffers - **Biometric Access Tools .**

TEXT BOOK(S):

Principles of Information Security – Michael E.Whitman and Herbert J.Mattord 4th Edition.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit – I – Chap 1 P. No. 3 to 11 , 16 to 19 26 to 32 ; Unit –II – Chap 2, Page No. 39 to 48, 54 to 57, 63 to 69, 72 – timing attack only; Unit – III – Chap 4 – P.No. 117 to 132, 144 to 153 ; Unit IV – Chap 5,6 P.No. 168 to 178,203 to 221, 238 to 242 ; Unit V – Chap 6,7 P.No.242 to 255, 270 to 277, 318 to 326, 331 to 333

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

| | | |
|----------------------------|---|---|
| PART - III CORE | Title : Lab 9 : Dot Net Programming Lab (VB/ASP) | Subject Code :17UCACP7 /16UCACP7 |
| Semester VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To implement basic program in .net framework like console & windows application

LAB CYCLE

CONSOLE APPLICATION

1. Calculating Sales and Commission.
2. Preparation of EB-Bill
3. Structure using Multiple Records.
4. SORTING Numbers in an given array
5. FUNCTION OVERLOADING using Switch Case

WINDOWS APPLICATION

6. Using ComboBox Displaying Shapes.
7. Calculation of Simple Interest and Compound Interest
8. Creation of Class Checking ARMSTRONG & REVERSE a Number.
9. Displaying Directories Using TREEVIEW
10. Dialog Control (Open,Save,Color,Font)
11. Factorial, +ve -vezero,Sum of series using Status and Progress Bar.
12. Using INHERITANCE calculating Net Salary
13. STRING Manipulation.

DATABASE CONNECTIVITY

14. Retrieving Record using DATAGRID
15. Displaying Record Using ComboxBox, ListBox and DataGrid.
16. Searching and Retrieving Record.
17. Updating a record using LISTVIEW
18. Payroll Processing by using EXCEL as Backend
19. Marksheet Processing application using ACCESS as Backend

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

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|--------------------------------|-------------------------------|---|
| PART - III ELECTIVE | Title : DATA MINING | Subject Code :17UCAE61/ 16UCAE61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

To understand concept of data ware housing, data mining, clustering techniques, neural networks and web mining

UNIT-I:

Data Warehousing –Introduction –Definition –Multidimensional Data Model –OLAP operations-Warehouse Schema –Architecture-Metadata-OLAP Engine- Backend Process.

UNIT-II:

Data Mining –Definition –Comparison with other fields-Techniques –Issues- Application Areas **Association Rules**-Methods-A Priori algorithm –Partition Algorithm –Pincer Search Algorithm-Border Algorithm –Generalized association rule –Item constraints.

UNIT-III:

Clustering Techniques –Paradigms –Algorithms –CLARA-CLARANS-Hierarchical clustering –DBSCAN-Categorical Clustering Algorithms-STIRR **Decision Trees** –Tree construction principle –Best split-Splitting indices –criteria – algorithms –CART –ID3.

UNIT-IV:

Other Techniques – Neural Network – Genetic Algorithm – Rough Sets –Support vector machines.

UNIT-V:

Web Mining –Introduction –Web content mining –web structure mining –web usage mining –text mining –hierarchy of categories- text clustering.

TEXT BOOK(S):

Data Mining techniques – Arun K Pujari –Universities Press -2001

CHAPTERS and SECTIONS Unit : Chap 2 (Except 2.8,2.1) . Unit II: Chap 3 (Except 3.11), Chap. 4 4.1 to 4.6 4.13,4.14,4.15 Unit III: Chap 5. (Except 5.9,5.10,5.13 to 5.15) Chap 6 – 6.1 to 6.9. Unit IV : Chap 8 8.2,8.6,8.7,7.1 to 7.3 Univ V : Chap 9(Except 9.7 and 9.8)

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

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|--------------------------------|---|---|
| PART - III ELECTIVE | Title : UNIX & SHELL PROGRAMMING | Subject Code :17UCAE62/ 16UCAE62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

Understand and learn the concept of Unix operating system

UNIT-I:Introduction –UNIX for beginners :Getting started-Day-to-day use:files and common commands-More about files:directories-The shell-The rest of the UNIX system-**The file system**:The basics of files-What's in a file?-Directories and filenames-Permissions-Inodes-The Directory hierarchy-Devices.

UNIT-II:Using the shell:Command line structure-Metacharacters-creating new commands-command arguments and parameters-Program output as arguments-Shell variables-More on I/O redirection-Looping in shell programs-bundle:putting it all together-Why a programmable shell?-**Filters**:Thegrep family-Other filters-The stream editor sed-The awk pattern scanning and processing language-Good files and good filters.

UNIT-III:Shell Programming : Customizing the cal command-which command is which?-while and until loops:watching for things-Traps:catching interrupts-Replacing a file:overwrite-zap:killing processes by name-The pick command:blanks vs. arguments-The news command:community service messages-get and put:tracking file changes-A look back-**Programming with standard I/O**:Standard input and output:vis-Program arguments:vis version 2-File access: vis version 3-A screen-at-a-time printer:p-Anexample:pick-On bugs and debugging-An example:zap-An interactive file comparison program:diff-Accessing the environment.

UNIT-IV:UNIX System Calls-Low-level I/O-File system: directories-File system:inodes-Processes-Signals and interrupts

UNIT-V:Program Development –A four-function calculator-Variables and error recovery-Arbitrary variable names;built-in functions-Compilation into a machine-Control flow and relational operators-Functions and procedures;input/output-Performance evaluation-A look back-**Document Preparation**-The ms macro package-The troff level-The tbl and eqn preprocessors-The manual page-Other document preparation tools.

TEXT BOOK(S):

The UNIX Programming Environment –Brian Kernighan, Rob Pike –Pearson Education -2003.

CHAPTERS and SECTIONS :

Unit I : Chap 1 and 2 Unit II : Chap-3 and 4 Unit III: Chap-5 and Chap-6 Unit IV- Chap-7.

Unit – V : Chap 8 and 9

REFERENCE BOOKS:

Introducing UNIX System V- Rachel Morgan, Henry McGilton-McGrawHill International Editions.

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(Syllabus under CBCS w.e.f. 2017 – 2018 onwards & 2016-17 Batch)

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|------------------------------|---|--|
| PART-III ELECTIVE | Title : PROJECT WORK & VIVA-VOCE | Subject Code : 17UCAEV1/ 16UCAEV1 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To give exposure on software development and maintenance
 - To train students, a systematic way of Report writing
 - To practice students for project presentation
1. A maximum of two students can join to do the project work
 2. Students must undertake the project work under the guidance of a faculty member
 3. Progressive reports have to be submitted to the guide periodically
 4. The internal test marks is 40 and is divided into the following components.
 - (i) Two Presentations - 2 X 10 = 20 marks
 - (ii) Progressive Reports - 10 marks
 - (iii) Internal Viva-voce - 10 marks
 5. The external examination will be jointly conducted by both the Internal and external examiners
 6. The students must submit 3 copies (2 copies for 2 students + 1 copy for the Dept.) of their Project Report two weeks before the external examination.
 7. The maximum marks for the external examination is 60 and it may be divided into the following components.
 - (i) Project Report - 20 marks
 - (ii) Project Presentation - 20 marks
 - (iii) Project viva-voce - 20 marks

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B.Sc. - BIO CHEMISTRY & BIOTECHNOLOGY
SYLLABUS
(Under CBCS w.e.f. 2017 - 2018 onwards)

518

I SEMESTER

| Sl. No | Sub. Code | Nature | Subject Title | Hrs / Week | Exam Hrs | CA | SE | Tot | Crd |
|--------------|-----------|--------------------|----------------------------|------------|----------|----|----|------------|-----------|
| 1 | 17UACT11 | Part-I | Tamil | 6 | 3 | 25 | 75 | 100 | 3 |
| | 17UACH11 | | Hindi | | | | | | |
| | 17UACS11 | | Sanskrit | | | | | | |
| 2 | 17UACE11 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UBCC11 | Part-III Core | Biomolecules | 5 | 3 | 25 | 75 | 100 | 5 |
| 4 | | Part-III Core | Core lab - I | 2 | - | - | - | - | - |
| 5 | 17UBCS11 | Part-IV SBS | Nutrition | 3 | 3 | 25 | 75 | 100 | 3 |
| 6 | 17UCYA11 | Part-III Allied | General Chemistry-I | 4 | 3 | 25 | 75 | 100 | 4 |
| 7 | | Part-III Allied | Lab in Allied Chemistry | 2 | - | - | - | - | - |
| 8 | 14UACVE1 | Part-IV | Value Education | 2 | 3 | 25 | 75 | 100 | 2 |
| TOTAL | | | | 30 | | | | 600 | 20 |

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| | | |
|----------------------------|-------------------------------|---------------------------------|
| PART - III CORE | Title : BIOMOLECULES | Subject Code : 17 UBCC11 |
| Semester : I | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To understand the structure and functions of Biomolecules such as Carbohydrates, Proteins, Amino acids, Lipids, and Vitamins.
- To recognize the structure and functional importance of Nucleic acids.
- To know about the physiological importance of biomolecules in the human system.
- To comprehend the occurrence, physical and chemical properties of biomolecules.

UNIT-I: Carbohydrates - occurrence and general importance of carbohydrates – Basic structure of glucose, its isomer and epimers and linkages – Biologically important disaccharides like lactose, maltose and sucrose. Polysaccharides – energy storage polysaccharides, starch and glycogen – structural polysaccharide – cellulose.

UNIT-II: Lipids – Fatty acids – Classification of some naturally occurring fatty acids into saturated acids, unsaturated acids into, branched chain acids, hydroxyl and keto derivatives and cyclic acids – physical properties of fatty acids – polymorphism, solubility, boiling point, absorption, spectrochemical properties of fatty acids – salt detergents and wetting agents, esters – reactions of unsaturated fatty acids – hydrogenation, halogenations and oxidation. Fats – chemical composition, physical and chemical properties of fats – Waxes – phospholipids – Classification – non phospholipids – steroids.

UNIT-III: Amino acids and proteins – Common amino acids of proteins – General properties of protein – colour, odour and taste, shape and size, composition, molecular weight, nature, denaturation, precipitation, solubility, optical activity, colour reaction, hydrolysis, Physical properties of amino acids – solubility, electrical properties, fundamental role of proteins in life – Composition of proteins – General properties of proteins – Rudimentary treatment of structure, classification of the proteins on the basis of their biological functions

UNIT-IV: Nucleic acids – fundamental role of nucleic acids in life processes – DNA and RNA – Structure of bases, nucleotides and nucleosides – bonds linking the various bases, primary, secondary and three – dimensional structures.

UNIT-V: Vitamins – Historical development to the discovery of vitamins- C – Brief mention of sources and physiological role of – Fat soluble vitamins – Vitamin A, D, E and K – Water soluble vitamins – Vitamin B complex, Vitamin C.



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Text book(s):

1. J.L. Jain (2003) **Fundamentals of biochemistry**, S. Chand Publication.
2. Renuka Harekrishnan (1995) **Biomolecules and Enzymes**, II Edition, Indraji Pub.

Chapters and sections (For UNIT-I, II, III,IV and V)

UNIT-I : Biomolecules and Enzymes by Renuka Harekrishnan – Chapter –II – Pg.no. 11-67

UNIT-II: Fundamentals of biochemistry by J.L. Jain, Sanjay Jain and Nitin Jain – Chapter – VIII & IX – Pg. no. 123 - 172

UNIT-III: Biomolecules and Enzymes by Renuka Harekrishnan – Chapter –III – Pg.no. 68-109

Chapters and sections (For UNIT-I, II, III,IV and V)

UNIT-IV: Biomolecules and Enzymes by Renuka Harekrishnan – Chapter –V – Pg.no. 173-207

UNIT-V : Fundamentals of biochemistry by J.L. Jain, Sanjay Jain and Nitin Jain – Chapter – 33 – Pg. no. 959 – 1024

Reference books:

1. Biochemistry, Lubert Stryer et al., fifth edition, W.H. Freeman and company, NY, 2003
2. Outlines of Biochemistry, E.E.Conn and Stump, Fourth edition, Wiley Eastern Ltd, 1989
3. Biochemistry, Lehninger, A.L. Nelson, Cox
4. Biochemistry, Donald Voet & Judith Voet, Wiley International Edition, 2004.

Web site Links: (E-learning resources)

<http://jpkc.gmu.cn/swhx/book/Biochemistry.pdf>



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| | | |
|----------------------------|----------------------------------|-----------------------|
| PART - III CORE | Title : CORE PRACTICAL- I | Subject Code : |
| Semester : I | HOURS : 2 hours / Week | CREDITS : - |

Objectives:

- To understand the techniques involved in the qualitative analysis of Biomolecules.
 - To comprehend the biochemical preparation from natural sources.
 - To recognize the instrumentation and principle behind colorimeter and pH meter.
1. Qualitative analysis of bioorganic compounds
 - a. Analysis of Carbohydrates
 - b. Analysis of amino acids
 - c. Test for proteins
 - d. Test for lipids- Test for cholesterol
 - e. Qualitative and quantitative tests for DNA and RNA
 2. Biochemical preparation
 - a. Starch from potato
 - b. Lactose from milk
 - c. Casein from milk
 - d. Caffeine from coffee seeds
 3. Use of pH meter for the preparation of buffer
 4. Verification of Beer- Lambert's law using colorimeter
 - i) Determining the concentration of any given colored compounds using standard graph.

Reference Book(s):

1. S. Sadasivam and A. Manickam (1996); **Biochemical Methods**, II Edition, New Age International Pvt. Ltd.



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| | | |
|--------------------------------|-------------------------------|---------------------------------|
| PART - IV SBS | Title : NUTRITION | Subject Code : 17 UBSC11 |
| Semester : I | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives:

- To understand the impact of nutrition in human system.
- To appreciate and recognize the nutritional requirements and calorific values in daily diet plan.
- To comprehend the nutritional requirements at various stages of human life span.

UNIT-I: Food groups, food habits, food fads and fallacies, changing food habits. Carbohydrates: kinds, functions, food sources – Fats: Kinds, functions, food sources, essential fatty acids and cholesterol

UNIT-II: Proteins: Kinds, functions, food sources, complete and incomplete proteins – Energy: Basal metabolism, measurement of BMR, factors affecting BMR, total energy requirement and energy value of foods.

UNIT-III: Protein nutritional Nitrogen balance, Quality of food proteins and requirements, protein nutrition abnormalities, protein deficiency disorder, PEM – Balanced diet formulation – Assessment of nutritional status.

UNIT-IV: Nutrition at various stages of growth and development – Diets for infants, children, adolescents, pregnant women, lactating mothers and older persons.

UNIT-V: Nutritional challenges of the future: Food production and food storages, future foods, new protein foods.

Text book(s):

1. B. Sivasankar (2002) **Food processing and preservation**, PHI Learning Pvt. Ltd. Publishers.
2. B. Srilakshmi (2007) **Food Science**, 6th Edition, New Age International Publication.

Chapters and sections (For UNIT-I, II, III,IV and V)

Unit- I : Nutrition and Dietetics by S.A. Joshi – Section – I – Pg.no.54-68

Unit – II : Nutrition and Dietetics by S.A. Joshi – Section – I – Pg.no. 25-31, 68-75.

Unit – III: Biochemistry – U.Satyanarayana & U.Chakrapani – unit -23- Pg.no. 510-518

Nutrition and Dietetics by S.A. Joshi –Section –III - Pg. no. 369-370, 382-403

Unit-IV : Nutrition and Dietetics by S.A. Joshi – Section –I -142-150

Unit –V: Nutrition and Dietetics by S.A. Joshi –Section –III - Pg. no.493-497



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Reference books:

1. Principles of Nutrition Determination Dietetics – Dr. M. Swaminathan
2. Advanced Textbook on food and Nutrition – Vol-I & II, Dr.M. Swaminathan, II edition
3. Normal and Therapeutic Nutrition – Corine Robinson.

Web site Links: (E-learning resources)

- <http://www.hindustantimes.com/india/food-fallacies/story-WWzEzOIngVeLdcQyIuPm8K.html>

Web site Links: (E-learning resources)

- <http://blogs.arynews.tv/food-fads-fallacies/>
- <http://www.biologydiscussion.com/single-cell-protein/production-of-single-cell-protein-and-mushrooms/10392>
- <http://www.slideshare.net/UXTrendspotting/future-of-food-37191410>



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II SEMESTER

| Sl. No | Sub. Code | Nature | Subject Title | Hrs / Week | Exam Hrs | CA | SE | Tot | Crd |
|--------------|-----------|-----------------|-------------------------|------------|----------|----|----|------------|-----------|
| 1 | 17UACT21 | Part-I | Tamil | 6 | 3 | 25 | 75 | 100 | 3 |
| | 17UACH21 | | Hindi | | | | | | |
| | 17UACS21 | | Sanskrit | | | | | | |
| 2 | 17UACE21 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UBCC21 | Part-III Core | Biochemical Techniques | 5 | 3 | 25 | 75 | 100 | 5 |
| 4 | 17UBCCP1 | Part-III Core | Core lab I | 2 | 3 | 40 | 60 | 100 | 2 |
| 5 | 17UBCS21 | Part-IV SBS | Pharmacology | 3 | 3 | 25 | 75 | 100 | 3 |
| 6 | 17UCYA21 | Part-III Allied | General Chemistry-II | 4 | 3 | 25 | 75 | 100 | 4 |
| 7 | 17UCYAP1 | Part-III Allied | Lab in Allied Chemistry | 2 | 3 | 40 | 60 | 100 | 2 |
| 8 | 14UACES1 | Part-IV | Environmental Studies | 2 | 3 | 25 | 75 | 100 | 2 |
| TOTAL | | | | 30 | | | | 800 | 24 |

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| | | |
|----------------------------|---|---------------------------------|
| PART - III CORE | Title : BIOCHEMICAL TECHNIQUES | Subject Code : 17 UBCC21 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To understand the impact of the scientific instrumentation in the area of research.
- To appreciate and recognize the working principle and applications of Biochemical instrumentation.
- To comprehend the importance and applications of radioactive isotopes.

UNIT-I: Colorimetry: Light spectrum and its wavelength regions- Complementary colors. Molar Extinction co-efficient. Beer Lambert's law and its applications.

UNIT-II: Centrifugation – Theory, relation between RPM and g- Differential centrifugation, Density gradient centrifugation - Different centrifuges. Measurement of Gases: Manometry.

UNIT-III: Chromatography: Column, Paper and Thin layer chromatography, Adsorption partition, Ion exchange, Gas chromatography and HPLC, Gel filtration, Dialysis.

UNIT-IV: Electrophoresis- Principles- Instrumentation, Application of different types of Electrophoresis- Agarose, SDS PAGE. Principles and application of Western blotting.

UNIT-V: Radioisotopes in Biochemistry: Radioactivity. Elementary units, Deduction and confirmation- Auto radiography, fluorography, isotopic tracer technique, Isotope dilution method.

Text book(s):

1. Keith Wilson and John Walker (2000), **Practical Biochemistry**, 5th Edition, Cambridge University Press.
2. Upadhyay & Upadhyay (2009) **Biophysical & Biochemical Techniques**, Revised Edition, Himalaya Publishing House, Mumbai.

Chapters and sections (For UNIT-I, II, III,IV and V)

Unit I: Analytical Biochemistry by Dr. P. Palanivelu – Part –II – Pg.no. 14-22

Unit II : Analytical Biochemistry by Dr. P. Palanivelu – Part –III – Pg. no. 107-113, Biochemical Techniques - Upadhyay & Upadhyay – chapter – 10 -301 - 343

Unit III : Analytical Biochemistry by Dr. P. Palanivelu – Part –III – Pg. no. 142- 167, Biochemical Techniques - Upadhyay & Upadhyay – chapter – 11 -344 - 421



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Unit IV : Analytical Biochemistry by Dr. P. Palanivelu – Part –III – Pg. no. 114 – 135,
Biochemical Techniques - Upadhyay & Upadhyay – chapter – 12 -422-478
Unit V: Fundamentals of biochemistry by J.L. Jain – Part- VI – Pg.no. 853-856, Biochemical
Techniques - Upadhyay & Upadhyay – chapter – 13 -479-545

Reference books:

1. Tools in Biochemistry, Terrance G.Cooper.
2. Separation methods in Biochemistry. CJOR Morris and Maris.
3. Spectroscopy in Biology and chemistry. Sow Hsinchen and Siney YI
4. The use of radioactive isotopes in the life sciences. Chapman and Acerey
5. Manometric and Biochemical techniques. Umbricit and Burris
6. Analytical Biochemistry by Dr. P. Palanivelu.

Reference books:

7. Modern Experimental Biochemistry 3rd edition, Rodney Boyer, Pearson education, 2004.

Web site Links (E-learning resources)

- <http://www.bioteach.ubc.ca/wp-content/uploads/2008/08/5DAYLABLECTURE2013.pdf>



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| | | |
|----------------------------------|----------------------------------|---------------------------------|
| PART - III CORE | Title : CORE PRACTICAL- I | Subject Code : 17 UBCCP1 |
| Semester : II | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives:

- To understand the techniques involved in the qualitative analysis of Biomolecules.
- To comprehend the biochemical preparation from natural sources.
- To recognize the instrumentation and principle behind colorimeter and pHmeter.

1. Qualitative analysis of bioorganic compounds

- a. Analysis of Carbohydrates
- b. Analysis of amino acids
- c. Test for proteins
- d. Test for lipids- Test for cholesterol
- e. Qualitative and quantitative tests for DNA and RNA

2. Biochemical preparation

- a. Starch from potato
- b. Lactose from milk
- c. Casein from milk
- d. Caffeine from coffee seeds

3. Use of pH meter for the preparation of buffer

4. Verification of Beer- Lambert's law using colorimeter

- (i) Determining the concentration of any given colored compounds using standard graph.

Reference Book(s):

1. S. Sadasivam and A. Manickam (1996) **Biochemical Methods** II Edition, New Age International Pvt. Ltd.



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| | | |
|--------------------------------|-------------------------------|---------------------------------|
| PART - IV SBS | Title : PHARMACOLOGY | Subject Code : 17 UBSC21 |
| Semester : II | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives:

- To learn basic scientific concepts and principles that will serve as the foundation for understanding the pharmacology of specific drugs.
- To understand the Pharmacology and clinical use of the major class of clinically important drugs.

UNIT-I: General Introduction to Pharmacology, Principle and concept of Pharmacology, Drug classes- herbal drugs and allopathy drugs.

UNIT-II: Route of administration, Drug metabolism- Drug distribution, transformation and elimination. Chemical pathways of drug metabolism Phase I and II reactions; Microsomal; and non microsomal metabolism of drugs, role of cytochrome P450.

UNIT-III: Pharmacological Classification of herbal extracts, Herbs and nutrition, Herbs and side effects. Herbal drugs for various diseases, herbal drug formulation

UNIT-IV: Scientific evaluation of traditional drugs. role of administration & acute toxic test on animals.

UNIT-V: Safety & efficacy of drugs, clinical studies with herbal drugs toxicology of crude extracts, herbal drug toxicity.

Text book(s):

1. **Pharmacological Microbiology**- Hegho WB and Rusellael.
2. **Pharmacological chemistry**- Satoskar Vol I and II

Chapters and sections (For UNIT-I, II, III,IV and V)

UNIT I : A concise text book of pharmacology.-N.Murugesh Pg.no. 1-3

UNIT II : A concise text book of pharmacology.-N.Murugesh Pg .no.12-19

UNIT III : A concise text book of pharmacology.-N.Murugesh Pg.no.4-8

UNIT IV : <http://www.sciencedomain.org/abstract/4872>

http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-879X2000000200004

UNIT V : <http://naturalingredient.org/wp/wp-content/uploads/42020.pdf>

Reference books:

1. Basic pharmacology- Henry, Hinter and Barbaroongle.
2. A concise text book of pharmacology.-N.Murugesh

Web site Links (E-learning resources)

- <http://www.mednotes.net/notes/pharmacology/>



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III SEMESTER

| Sl. No | Sub. Code | Nature | Subject Title | Hrs / Week | Exam Hrs | CA | SE | Tot | Crd |
|--------------|----------------------|--------------------|--|------------|----------|----|----|------------|-----------|
| 1 | 17UACT31/ H31/S31 | Part-I | Tamil/Hindi/ Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE31 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UBCC31 | Part-III Core | Enzymology and Enzyme Technology | 5 | 3 | 25 | 75 | 100 | 5 |
| 4 | | Part-III Core | Core lab II - Lab in Biochemical Analysis | 2 | - | - | - | - | - |
| 5 | 17UBCS31 | Part-IV SBS | Medical Lab Technology | 3 | 3 | 25 | 75 | 100 | 3 |
| 6 | 17UBCA31 | Part-III Allied | Cell Biology and Genetics - Allied Biology Theory - I | 4 | 3 | 25 | 75 | 100 | 4 |
| 7 | | Part-III Allied | Cell Biology and Genetics & Biodiversity and Conservation - Allied Biology Lab | 2 | - | - | - | - | - |
| 8 | 17UBCN31 | Part-IV NME | Health and Human Diseases - Non Major Elective - I | 2 | 3 | 25 | 75 | 100 | 2 |
| TOTAL | | | | 30 | | | | 600 | 20 |

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| | | |
|----------------------------|---|---------------------------------|
| PART - III CORE | Title : ENZYMOLOGY AND ENZYME TECHNOLOGY | Subject Code : 17 UBCC31 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To provide a theory base and knowledge relevant to the enzymology principles including fundamental properties of enzymes, enzyme catalytic mechanisms and enzyme kinetics.
- To acquire insight about the production, extraction, purification, characterisation and application of enzymes.

UNIT I: Classification and Nomenclature of enzymes, Isolation, purification – Dialysis, Gel filtration chromatography, Ion exchange chromatography and Affinity chromatography, Functions and Characterization of enzymes.

UNIT II: Enzyme kinetics: Enzyme specificity – Stereo specificity, structural specificity, functional specificity. Enzyme activity – Oxidation, Reduction, Isomerization, phosphorylation, Acetylation, Methylation, Dehydration, Decarboxylation and Transamination.

UNIT III: Enzyme kinetics: Enzyme – Substrate complexes, Michaelis – Menten kinetics – Determination of K_m and V_{max} – Lineweaver – Burk plot, Hanes Woolf equation, Eadie – Hofstee equation, Factors influencing enzyme activity, Enzyme inhibition – Reversible inhibition – Competitive, non- competitive, Uncompetitive inhibition, Irreversible inhibition, Allosteric inhibition.

UNIT IV: Mechanism of Enzyme action – Chymotrypsin. Role of co-enzymes in Enzyme reactions – Co- enzyme A, NAD, FAD, TPP, pyridoxal phosphate, Zymogens – Activation of Digestive Enzymes – chymotrypsinogen, Trypsinogen.

UNIT V: Enzyme immobilization – methods – Adsorption, Covalent bonding, Cross linking, Entrapment, Encapsulation and its Applications, Clinical and Industrial applications of enzymes, Biosensors and their applications.

Text Books:

1. Renuka Harikrishnan., (2007) **An introduction to Biomolecules and Enzymes**, 5th edition, Indrajai Pathipagam, Madurai.
2. Palanivelu. P., **Enzymes and Ribozymes**, Twenty first century publications.
3. Palanivelu. P., **Basic concepts in Enzymology**, Twenty first century publications.



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Chapters and sections (For UNIT-I, II, III,IV and V)

Unit I: An introduction to Biomolecules and Enzymes,- Renuka Harikrishnan –Page.no 248-282

Unit II: An introduction to Biomolecules and Enzymes,- Renuka Harikrishnan –Page.no 283-288, 372-380

Unit III: Essentials of Biochemistry- U.Satyanarayana Page.no 41-56 ,299-344.

Unit IV: An introduction to Biomolecules and Enzymes,- Renuka Harikrishnan –Page.no 390-424

Unit V: An introduction to Biomolecules and Enzymes,- Renuka Harikrishnan –Page.no 425-459

Reference Books:

1. Alan fresht, (1997) Enzyme structure and mechanism, W.H.Freeman and company New York.
2. Donald Voet & Judith Voet; (2004) Fundamentals of Biochemistry, Wiley International 3rd edition.
3. Jain JL; (2008) Fundamentals of Biochemistry, 1st Single word edition, S. Chand & Company ltd.
4. A.L. Lehninger, D.L. Nelson and M.M. Cox. (1993): Principles of Biochemistry Worth publishers, New York.

Web site Links (E-learning resources)

- <http://www.easybiologyclass.com/enzyme-cell-immobilization-techniques/>



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|----------------------------------|--|-----------------------|
| PART - III CORE | Title : CORE PRACTICAL – II:– LAB IN BIOCHEMICAL ANALYSIS | Subject Code : |
| Semester : III | HOURS : 2 hours / Week | CREDITS :- |

Objectives:

- To discover about the fundamental approaches for experimentally investigating biochemical problems
- To learn the theoretical foundations and understand the applicability of the biochemical methods to realistic situations.

Analysis of Lipids:

1. Determination of Iodine number.
2. Determination of Saponification number.
3. Estimation of Total Cholesterol by Zak's method.

Analysis of Carbohydrates:

1. Estimation of glucose by Phenol sulphuric acid method.
2. Estimation of glucose by Anthrone method.
3. Estimation of glucose by Benedict's method.
4. Estimation of pentose by Bial's method.
5. Estimation of fructose by Seliwanoff method.
6. Estimation of Lactose in milk – by Benedict's method.
7. Estimation of Maltose by DNS method.

Analysis of Proteins:

1. Estimation of protein by Lowry's method.
2. Estimation of protein by Biuret method.

Analysis of Vitamins:

1. Estimation of Ascorbic acid by Dye method.
2. Estimation of Niacin.

Analysis of Minerals:

1. Estimation of Phosphorous by Fiske-Subbarow method.
2. Estimation of Iron by Bathophenanthroline method.

Reference books:

1. Harold Varley, (1991) **Practical clinical biochemistry**, 5th edition, CBS Publishers.
2. J.Ochei and A. Kolhatkar, (2000) **Medical laboratory science**, Tata Mc graw Hill publication,
3. Carl A. Burtis & Co, Tietz (2006) **Text book of Clinical chemistry and Molecular Diagnostics** 4th edition, Elsevier Publication.



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| | | |
|--------------------------------|---|-------------------------------|
| PART - IV SBS | Title : MEDICAL LAB TECHNOLOGY | Subject Code : 17 UB31 |
| Semester : III | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives:

- To comprehend the theoretical basics of preclinical subjects such as Biochemistry, Pathology, Microbiology and Blood Banking.
- To gain insight about the diagnosis, treatment and prevention of disease through the use of clinical laboratory tests.
- To explain and apply basic principles of medical terminology, safety measures, universal precautions, infection control and potential sources of error as they relate to standard laboratory operating procedures and quality patient care.

Unit I Blood and urine analysis

Blood analysis- collection and preservation of blood- anticoagulants- normal haematological values- prevention of clotting. Blood banking urine analysis- collection and preservation of urine. Macroscopic and microscopic examination of urine culture- chemical examination of urinary calculi.

Unit II Mycology

Introduction to common fungal disease- Investigation of infectious candidiasis, Mycetomas, Cryptococcus.

Unit III Immunological Diagnosis

Collection and preservation of serum- Measurement of Antibodies, Agglutinations reaction, Precipitation reaction, Widal's test, Serological tests for Syphilis- VDRL slide flocculation test, ELISA.

Unit IV Molecular Biology Techniques:

Polymerase chain reaction for detection of diseases- sample processing for DNA extraction- DNA fingerprinting.

Unit V Hematology and Blood banking

Complete Haemogram- grouping & "Rh" typing- Blood Bank setup- Blood collection screening, storage, cross matching & Blood transfusion.

Text Books:

1. M.Mukerjee (2005) **Medical lab technology**, Vol-I to III, McGraw-Hill Publication.
2. David friefelder (2000) **Molecular biology**, Jones – Bartlette Publishers.



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Chapters and sections (For UNIT-I, II, III, IV and V):

Unit I: http://www.thl.fi/publications/ehrm/product2/part_iii4.htm

<https://en.wikipedia.org/wiki/Anticoagulant>

<http://www.med.unc.edu/md/wms/files/MS2%20Pulm%20Normal%20Labs.pdf>

<http://www.bd.com/vacutainer/labnotes/Volume14Number2/>

<http://library.med.utah.edu/WebPath/TUTORIAL/URINE/URINE.html>

<http://www.aafp.org/afp/2006/0701/p86.html>

Unit II: <http://www.healthline.com/health/skin/cutaneous-candidiasis#Causes3>

<http://patient.info/in/doctor/mycetoma-madura-foot>

<http://emedicine.medscape.com/article/215354-overview>

Unit III: vlab.amrita.edu/?sub=3&brch=69&sim=196&cnt=1

<https://medlineplus.gov/ency/article/003515.htm>

Unit IV:

http://envfor.nic.in/divisions/csurv/biosafety/Gef2/T5/16%20Dr%20Randhawa_%20Isolation%20&%20purification%20of%20genomic%20DNA.pdf

http://www.nbpgr.ernet.in/Portals/6/DMX/GENOMIC_RESOURCES/DNA%20extraction-Comparison%20of%20methodologies.pdf

Unit V: https://en.wikipedia.org/wiki/Complete_blood_count.

<http://cfavm.org/notes/DrAlleman/Complete%20Hemogram%20.pdf>

Reference books:

1. Clinical chemistry – Teetz.
2. Practical chemistry – Varley.
3. Immunology – Roitss.
4. Medical laboratory techniques by- Godger.
5. Haematology- Ramnik sood.

Web site Links(E-learning resources)

- study.com/what_does_a_medical_lab_technician_do.html



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|------------------------------|--|---------------------------------|
| PART - III ALLIED | Title : CELL BIOLOGY & GENETICS | Subject Code : 17 UBCA31 |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To describe the most important functions of the cell, its microscopic structure and the structure and function of the different cell organelles.
- To provide basic genetic terminology at a general level and describe the organisation and development of the genetic makeup on cellular, chromosomal and gene level and be able to explain the basic molecular genetic mechanisms in relation to the structure and function of the cells.

Unit I: Cell Structure – prokaryotic and eukaryotic (comparison) - plant and animal cells.

Microscopy: Principles of Light and Electron microscopy. Plasma membrane – Chemistry and ultra-structure – Fluid Mosaic model- functions. Protoplasm – Chemistry and organization – microtubules and microfilaments (a brief account). Endoplasmic reticulum and Golgi complex – structure and functions.

Unit II: Lysosomes – ultra structure and functions, types. Ribosomes – ultra structure and functions. Chloroplast – ultra structure and chemistry, function – mechanism of photosynthesis and generation of ATP to be explained briefly. Mitochondria – ultra structure and functions (a brief account).

Unit III: Nucleus – Nuclear envelop –nucleolus-structure and function. Chromatin –structure - nucleosomes. Cell Cycle – G1, S & G2 phases (a brief account). Cell division: Mitosis and Meiosis – stages and their significance.

Unit IV: Mendelian Genetics-Mendel's experiments, Mendel's laws of inheritance, Test cross and Back cross. Allelic gene interaction-complementary genes (Flower colour in Sweet Pea), epistasis-dominant (Fruit colour in Cucurbita) and recessive (Coat colour in Mice). Non-allelic gene interaction-Incomplete dominance (Flower colour in Mirabilis) and multiple gene interaction (ABO Blood Group inheritance in Human).

Unit V: Linkage – Principles - linkage in Drosophila. Crossing over in Drosophila- mechanism and significance of crossing over (theories of crossing over are not necessary). Sex linked inheritance (Hemophilia and colour blindness).

Text Books:

1. N. Arumugam (2010). **Cell and Molecular Biology**.Saras Publications
2. V.K. Agarwal (2000). **Cell Biology**. S. Chand & Co., New Delhi.
3. R.P.Meyyan(2012). **Genetics**. Saras Publications
4. C.B.Powar (2010).**Cell biology**.Navodhaya publishing house.

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Chapters and sections (For UNIT-I, II, III, IV and V):

Unit I: Cell biology, Genetics, Molecular biology, Evolution and Ecology-Dr.P.S.Verma and Dr.V.K.Agarwal
Pg.no:32-55,112-153

Chapters and sections (For UNIT-I, II, III, IV and V):

Unit II: Cell biology, Genetics, Molecular biology, Evolution and Ecology-Dr.P.S.Verma and Dr.V.K.Agarwal
Pg.no: 191-219 ,280-292

Unit III: Cell biology, Genetics, Molecular biology, Evolution and Ecology-Dr.P.S.Verma and Dr.V.K.Agarwal
Pg.no:243-256 ,318-341

Unit IV: Principles of Genetics – R.H.Tamarin- Part –II – Pg.no. 16-46

Unit V: Principles of Genetics – R.H.Tamarin- Part –VI – Pg.no. 110-146

Reference books:

1. B. Albert, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson (1983) Molecular biology of the cell, New York, Garland.
2. E.D.P. De Robertis, F.A. Saez and E.M.F. De Robertis (1990) Cell and Molecular Biology 3rd edition, McGraw – Hill Pub.
3. Gardener, J., Simmons, H.J. and Snustad, D.P. 1991.Principles of Genetics (5thEdition).John Wiley & Sons, NewYork.

Web site Links (E-learning resources)

- <http://biology.tutorvista.com/cell/cell-structure.html>
- <https://www.ascb.org/wp-content/uploads/2015/12/FawcettTheCellChapter6.pdf>
- <http://biology.tutorvista.com/animal-and-plant-cells/golgi-apparatus.html>
- <http://classes.uleth.ca/200603/biol3000b/18.pdf>
- http://www.ncert.nic.in/html/learning_basket/biology/cc&cd.pdf
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>



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| PART - III ALLIED | Title : Lab in Biology–Cell Biology and Genetics & Biodiversity and Conservation | Subject Code : |
| Semester : III | HOURS : 2 hours / Week | CREDITS : - |

Objectives:

- To obtain hands-on experience with experimental approaches used to solve problems in Cell Biology, Genetics and Biotechnology.
- To become familiar with some of the equipment and techniques commonly used to study the molecular basis of living systems and gain experience with the quantitative aspects of cellular and molecular biology research.
- To learn about biomes, biodiversity, and biological conservation and the difficulties associated with managing natural resources.

1. Study of Parts and functions of compound microscope
2. Study of Cell inclusions: Starch grains – smear of potato, banana or rice., Cystolith– Sections of *Ficus* leaves
3. Study of cell organelles using photomicrographs
4. Study of various stages of mitosis and meiosis using *Allium cepa* roots and *Rheo* flower buds.
5. Study of Survey of mendelian traits in man.
6. To work out simple genetic problems in monohybrid and dihybrid crosses.
7. Measuring Biodiversity – Species diversity index (Simpson's Index) of vegetation.
8. Analysis of the vegetation for frequency, density and abundance using quadrat method.
9. By using world and Indian map mark important Biodiversity regions.
10. Collection of endemic plants and animals photos with information by using websites, journals, Newspapers

Reference books:

1. N. Arumugam (2010). **Cell and Molecular Biology**. Saras Publications
2. V.K. Agarwal (2000). **Cell Biology**. S. Chand & Co., New Delhi.
3. R.P.Meyyan(2012). **Genetics**. Saras Publications
4. B. Albert, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson (1983) **Molecular biology of the cell**, New York, Garland.
5. E.D.P. De Robertis, F.A. Saez and E.M.F. De Robertis (1990) **Cell and Molecular Biology** 3rd edition, McGraw – Hill Publications.
6. **CPR Manual of Biodiversity** (2003) – Environmental Education centre, Chennai.
7. K.V. Krishnamurthy (2003) **An Advanced book on Biodiversity** – Principles and Practice – Oxford SIBH publishing Co. Pvt. Ltd., New Delhi.



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| PART - IV NME | Title : HEALTH AND HUMAN DISEASES | Subject Code : 17 UBCN31 |
| Semester : III | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives:

- To comprehend the structure and function of the human body in health; signs and symptoms of disease; the molecular basis of disease; current treatment of disease and cutting edge therapeutics.

Unit I: Introduction- importance of being healthy –Physical and Mental Health - yoga - nutrition, exercise, Causes of disease- environment- age- living conditions- Life style- Obesity- BMI.

Unit II: Diseases- cause- symptoms- treatment of- heart diseases- jaundice- cancer.

Unit III: AIDS-Nosocomial diseases- traveling diseases- children and old age diseases- T.B- leprosy- Dengue-Bird flu.

Unit IV: Diseases prevention- healthy habits, disease prevention awareness- vaccination- immunization schedule.

Unit V: First aid measures- Accident care- Bleeding and Wound care- Fractures and dislocations- electrical shock- burns- breathing emergency- Allergies- pregnancy care.

Text Books:

1. **Clinical biochemistry**- Chatterjee
2. Kavanagh James. “**Emergency First Aid**” Waterford publisher.

Chapters and sections (For UNIT-I, II, III,IV and V)

Unit I: Biological Science-D.J.Taylor, N.P.O.Green, G.W.Stout. Page.no:495-500,527-531

Unit II: Biological Science-D.J.Taylor, N.P.O.Green, G.W.Stout. Page.no: 520-526.

Unit III: <http://download.nos.org/srsec314newE/PDFBIO.EL28.pdf>

Unit IV: <http://www.immunize.org/catg.d/p2011.pdf>

Unit V: http://www.redcross.org/images/MEDIA_CustomProductCatalog/m55540601_FA-CPR-AED-Part-Manual.pdf, <https://www.city.sapporo.jp/shobo/kyukyu/documents/allpages.pdf>

Reference books:

1. Microbiology- Alcamo.
2. Fundamentals of Biochemistry- A.C.Deb.
3. Kathleen handal. “The American Red Cross First Aid and safety Handbook.”
4. www.wikipedia.com

Web site Links: (E-learning resources)

- <http://kmbiology.weebly.com/human-health-and-disease---notes.html>

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IV SEMESTER

| Sl. No | Sub. Code | Nature | Subject Title | Hrs / Week | Exam Hrs | CA | SE | Tot | Crd |
|--------------|----------------------|--------------------|--|------------|----------|----|----|------------|-----------|
| 1 | 17UACT31/ H31/S31 | Part-I | Tamil/Hindi/ Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | I7UACE41 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UBCC41 | Part-III Core | Metabolism | 5 | 3 | 25 | 75 | 100 | 5 |
| 4 | 17UBCCP2 | Part-III Core | Core lab II – Lab in Biochemical Analysis | 2 | 3 | 40 | 60 | 100 | 2 |
| 5 | 17UBCS41 | Part-IV SBS | Biostatistics (Skilled) | 3 | 3 | 25 | 75 | 100 | 3 |
| 6 | 17UBCA41 | Part-III Allied | Biodiversity and Conservation - Allied Biology Theory - II | 4 | 3 | 25 | 75 | 100 | 4 |
| 7 | 17UBCAP2 | Part-III Allied | Cell Biology and Genetics & Biodiversity and Conservation - Allied Biology Lab | 2 | 3 | 40 | 60 | 100 | 2 |
| 8 | 17UBCN41 | Part-IV NME | Herbal Medicine - Non Major Elective – II | 2 | 3 | 25 | 75 | 100 | 2 |
| 9 | | Part-V | Extension Activities | - | - | - | - | 100 | 1 |
| TOTAL | | | | 30 | | | | 900 | 25 |

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|----------------------------|-------------------------------|---------------------------------|
| PART - III CORE | Title : METABOLISM | Subject Code : 17 UBCC41 |
| Semester : IV | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To understand the fundamental energetics of biochemical processes and chemical logic of metabolic pathways.
- To recognize the basic mechanisms of pathway regulation and understand the relation between biochemical defects and metabolic disorders.

UNIT I: Bioenergetics: High energy and low energy phosphates, Electron transport chain, Oxidative phosphorylation.

UNIT II: Carbohydrate metabolism: Conversion of simple sugars (Sucrose, Maltose, Lactose) into Glucose, Glycolysis, TCA cycle, Energetics of Glucose metabolism, HMP shunt and Gluconeogenesis, Glycogen metabolism – Glycogenesis, Glycogenolysis.

UNIT III: Lipid metabolism: Biosynthesis of Fatty acids, β – Oxidation of Fatty acids, Energetics of Fatty acid Oxidation, Ketone bodies metabolism, Metabolism of Triacyl glycerols, phospholipids, Cholesterol metabolism.

UNIT IV: Amino acid metabolism: A brief account of Amino acid metabolism – glycine, Cysteine, proline, Homoserine, phenylalanine, tyrosine, tryptophan.

UNIT V: Nucleic acid metabolism: Purine and Pyrimidine bases – Biosynthesis of Purine and Pyrimidine, Biosynthesis of DNA and RNA.

Text Books:

1. Chatterjee, (2005) **Text book of medical biochemistry**, 6th edition, Jaypee brothers publication.
2. Devlin (1997) **Text book of Biochemistry**, 4th edition, John Wiley & sons, INC Publications.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: - Biochemistry by U.Satyanarayana- Page.no 119-127,120-130

Unit II: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 266-329

Unit III: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 336-394

Unit IV: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 402-459

Unit V: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 205-242

Reference books:

1. Donald Voet & Judith Voet (2004) **Fundamentals of Biochemistry**, 3rd edition, Wiley International.
2. Lehninger, Nelson AL Cox, (2003) **Principles of Biochemistry**, 4th edition, W.H. Freeman and company.
3. R.K. Murray, P.A. Mayes, D.K. Granner, and V.W. Rodwell (1990) **Harper's Biochemistry**, Lange Medical Book

Reference books:

4. Murray.K, Meyes.P.A, Rodwell.V.W, (2003) **Harper's illustrated Biochemistry**, 26th edition, International edition, McGraw - Hill companies.

Web site Links (E-learning resources) <http://www.news-medical.net/life-sciences/What-is-Metabolism.aspx>



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| PART - III CORE | Title : Core Practical – II: Lab in Biochemical Analysis | Subject Code : 17 UBCCP2 |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives:

- To discover about the fundamental approaches for experimentally investigating biochemical problems
- To learn the theoretical foundations and understand the applicability of the biochemical methods to realistic situations.

Analysis of Lipids:

1. Determination of Iodine number.
2. Determination of Saponification number.
3. Estimation of Total Cholesterol by Zak's method.

Analysis of Carbohydrates:

1. Estimation of glucose by Phenol sulphuric acid method.
2. Estimation of glucose by Anthrone method.
3. Estimation of glucose by Benedict's method.
4. Estimation of pentose by Bial's method.
5. Estimation of fructose by Seliwanoff method.
6. Estimation of Lactose in milk – by Benedict's method.
7. Estimation of Maltose by DNS method.

Analysis of Proteins:

1. Estimation of protein by Lowry's method.
2. Estimation of protein by Biuret method.

Analysis of Vitamins:

1. Estimation of Ascorbic acid by Dye method.
2. Estimation of Niacin.

Analysis of Minerals:

1. Estimation of Phosphorous by Fiske-Subbarow method.
2. Estimation of Iron by Bathophenanthroline method.

Reference books:

1. Harold Varley, (1991) **Practical clinical biochemistry**, 5th edition, CBS Publishers.
2. J.Ochei and A. Kolhatkar, (2000) **Medical laboratory science**, Tata Mc graw Hill publication,
3. Carl A. Burtis & Co, Tietz (2006) Text book of Clinical chemistry and Molecular Diagnostics 4th edition, Elsevier Publication



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| PART - IV SBS | Title : BIostatistics | Subject Code : 17 UB41 |
| Semester : IV | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives:

- To introduce the biostatistical methods and to understand the underlying principles, as well as practical guidelines
- To provide insight into both descriptive and inferential statistical techniques, with emphasis on selection of appropriate application and interpretation of results.

Unit I :Introduction: Basis of Statistics – Definition – statistical methods – kinds of Biological Data Collection, organization and Representation of Data:

1. Collection of Data – Types of data: primary data, secondary data – methods of collecting data.
2. Sampling and sampling designs – Meaning and definitions – Random and Non random sampling
3. Editing the data: Definition for editing, objectives of editing, problems of Accuracy, problems of approximation and errors.
4. Classification of data: Meaning, Definition, Objectives of Classification of data.

Unit II :Tabulation: Meaning and definition – of parts of tables – advantages.

Representation of data: Diagrammatic: simple bar diagram, rectangles, squares, circles or pie diagram – Graphic representation: Histogram, frequency – polygon frequency curve, cumulative frequency curve or O give curve.

Unit III: Measures of central Tendency: Explanation, Types of averages: 1. Arithmetic mean 2. Median 3. Mode. Explanation Problems related to: ungrouped data, Simple grouped data: continuous, discrete series.

Measures of dispersion: Explanation, Types of dispersion: 1. Range 2. Mean deviation 3. Standard deviation and Variance. Problems related to the above mentioned dispersion taking ungrouped data.]

Unit IV Probability: Definition and Explanation:

1. Theorem and probability: addition theorem and multiplication theorem.
2. Types of theoretical distribution: Binomial distribution (simple problems), Poisson distribution and Normal distribution (explanation problems not necessary).



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Unit V Correlation and Regression: Correlation Explanation

1. Types of correlation: Positive and negative correlation- Simple partial and multiple correlation- linear and non-linear correlation.
2. A method of studying correlation using Karl Pearson's co-efficient of correlation (simple problems related to correlation).

Regression analysis:

Explanation: Regression line- Regression equation: regression equation of X on Y, regression equation of Y on X.

Text Books:

1. S.P.Gupta (2003) **Statistical methods**
2. R.C.Kothari (2004) **Research methodology**

Reference book(s):

1. Biostatistics- A foundation for analysis in health science- Daniel

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Statistical methods- S.P.Gupta – pg.no.: E 1.1 – E 5.4

Unit II: Statistical methods- S.P.Gupta – pg.no.: E-5.18-E 8.51

Unit III: Statistical methods- S.P.Gupta – pg.no.: E 7.1-E 8.6

Unit IV: Statistical methods- S.P.Gupta – pg.no.: A 1.1-1.56, A 2.1-2.75

Unit V: Statistical methods- S.P.Gupta – pg.no.: E 10.1-10.61; E11.1-11.53.

Web site Links (E-learning resources)

- <https://www.stat.ubc.ca/~rollin/teach/643.f02/notes/>
https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_extension_trainees/ln_biostat_hew.pdf
- <https://www.scribd.com/doc/71132284/Graphical-Representation-of-Statistical-Data>



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|------------------------------|---|---------------------------------|
| PART - III ALLIED | Title : Biodiversity and Conservation (Allied Biology Theory - II) | Subject Code : 17 UBCA41 |
| Semester : IV | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To describe the most important functions of the cell, its microscopic structure and the structure and function of the different cell organelles.
- To provide basic genetic terminology at a general level and describe the organisation and development of the genetic makeup on cellular, chromosomal and gene level and be able to explain the basic molecular genetic mechanisms in relation to the structure and function of the cells.

Unit I: Biodiversity – introduction, concept and scope of Biodiversity. Levels of Biodiversity – Genetic, species & Ecosystem diversity. Values of Biodiversity. Organizations associated with Biodiversity management – IUCN, UNEP, UNESCO and WWF.

Unit II: Measures of Biodiversity – alpha, beta and gamma diversity; species richness and evenness; Species Diversity indices – Simpson Index and Shannon Index. Sampling method-Quadrat method.

Unit III: Megadiversity centres & Hotspots (a brief account). Threats to Biodiversity – IUCN categories of threat. Role of CITES.

Unit IV: Conservation of Biodiversity - Need for conservation – Methods of conservation – *in situ* – conserved areas of India - National Parks, Sanctuaries, Biosphere reserves and Sacred Groves -*ex situ* conservation – Cryopreservation and Germplasm conservation.

Unit V: International Conventions on Conservation- Convention on Biological Diversity, Ramsar convention, TRIPS- Copyright and Patent, Trademarks, Industrial Designs, Geographical Indications & Layout design of integrated circuits, UPOV, IUPGR (a brief introduction). People's movements to conserve Biodiversity – Chipko movement & Silent valley movement (a brief account)

Text Books:

1. CPR **Manual of Biodiversity** (2003) – Environmental Education centre, Chennai
2. K.V. Krishnamurthy (2003) **An Advanced book on Biodiversity – Principles and Practice** – Oxford SIBH publishing co. pvt. Ltd., New Delhi.



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Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: V. Krishnamurthy (2003) An Advanced book on Biodiversity —Pg.No: 1-7, 67-80

Unit II: V. Krishnamurthy (2003) An Advanced book on Biodiversity —Pg.No: 28-34

Unit III: CPR Manual of Biodiversity (2003) – Environmental Education centre - Pg.No: 13-16, 26-30

Unit IV: V. Krishnamurthy (2003) An Advanced book on Biodiversity —Pg.No: 106-138

Unit V: V. Krishnamurthy (2003) An Advanced book on Biodiversity —Pg.No: 138-142

Reference book(s):

1. D.K.Belsare (2007). Introduction to Biodiversity. APH Publishing Corporation, New Delhi.

Web site Links: (E-learning resources)

- <http://study.com/academy/lesson/what-is-biodiversity-definition-and-relation-to-ecosystem-stability.html>



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| PART - III ALLIED | Title : Lab in Biology–Cell Biology and Genetics & Biodiversity and Conservation | Subject Code : 17 UBCAP2 |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives:

- To obtain hands-on experience with experimental approaches used to solve problems in Cell Biology, Genetics and Biotechnology.
- To become familiar with some of the equipment and techniques commonly used to study the molecular basis of living systems and gain experience with the quantitative aspects of cellular and molecular biology research.
- To learn about biomes, biodiversity, and biological conservation and the difficulties associated with managing natural resources.

1. Study of Parts and functions of compound microscope
2. Study of Cell inclusions: Starch grains – smear of potato, banana or rice., Cystolith– Sections of *Ficus* leaves
3. Study of cell organelles using photomicrographs
4. Study of various stages of mitosis and meiosis using *Allium cepa* roots and *Rheo* flower buds.
5. Study of Survey of mendelian traits in man.
6. To work out simple genetic problems in monohybrid and dihybrid crosses.
7. Measuring Biodiversity – Species diversity index (Simpson's Index) of vegetation.
8. Analysis of the vegetation for frequency, density and abundance using quadrat method.
9. By using world and Indian map mark important Biodiversity regions.
10. Collection of endemic plants and animals photos with information by using websites, journals, newspapers

Reference books:

1. N. Arumugam (2010). Cell and Molecular Biology. Saras Publications
2. V.K. Agarwal (2000). Cell Biology. S. Chand & Co., New Delhi.
3. R.P. Meyyan (2012). Genetics. Saras Publications
4. B. Albert, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson (1983) Molecular biology of the cell, New York, Garland.
5. E.D.P. De Robertis, F.A. Saez and E.M.F. De Robertis (1990) Cell and Molecular Biology 3rd edition, McGraw – Hill Publications.
6. CPR Manual of Biodiversity (2003) – Environmental Education centre, Chennai.
7. K.V. Krishnamurthy (2003) An Advanced book on Biodiversity – Principles and Practice – Oxford SIBH publishing Co. Pvt. Ltd., New Delhi.



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| PART - IV NME | Title : HERBAL MEDICINE | Subject Code : 17 UBCN41 |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives:

- To gain awareness of the current basic scientific research on some of the important herbal agents used in Traditional Medicine.
- To acquire knowledge of popular herbal formulae and their general usage.

Unit I

Introduction: Scope- Alternative systems of medicine- advantages- human system- herbals for human system- definition.

Unit II

Secondary metabolites: Source- different types- action – medicinal plants- pharmacological action- toxicity.

Unit III

Herbal cultivation: Plant- types- Methodology- marketing- economic potential- pharmacological companies- manufacture- patency- GATT- TRIPS-WTO.

Unit IV

Herbal gardening: Types- methodologies- application- home gardens- types- methodologies- application- home made remedies- herbal formulations- herbal physiotherapy.

Unit V

Plant propagation: Definition- types- grafting- endangered plants- need for conservation – techniques- tissue culture- requirements-techniques-Micro propagation.

Text Books:

1. **Introduction to spices, plantation crops, Medicinal aromatic plants-** N.Kumar *et.al.*,
2. **Biotechnology of Secondary metabolites-** K.G.Ramawt, J.M.Muriton.

Reference books:

1. Indian medicinal plants Vol I to Vol V.
2. A compendium of 500 species- Orient Longman.

Web site Links: (E-learning resources)

- <https://monographs.iarc.fr/ENG/Monographs/vol82/mono82-6A.pdf>



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V SEMESTER

| Sl. No | Subject Code | Nature | Subject Title | Hou rs /Wee k | Duration of exams | C A | SE | Tot | Crd |
|--------------|--------------|------------------------|--|------------------------|----------------------|--------|----|------------|-----------|
| 1 | 17UBCC51 | Part-III Core | Molecular Biology | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 17UBCC52 | Part-III Core | General Microbiology | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 17UBCC53 | Part-III Core | Immunology & Immunotechnology | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UBCE51 | Part-III Elective 1 | Medical Diagnostics | 5 | 3 | 25 | 75 | 100 | 5 |
| 5 | 17UBCE52 | Part-III Elective 2 | Bioinformatics | 5 | 3 | 25 | 75 | 100 | 5 |
| 6 | 17UBCCP3 | Part-III Core Lab | Lab in Microbiology & Immunology | 5 | 3 | 40 | 60 | 100 | 4 |
| 7 | 16 USS S51 | Self Study | Soft Skill | - | - | - | - | 100 | - |
| TOTAL | | | | 30 | | | | 700 | 26 |

Passed in the BOS Meeting
held on 15-3-2017

Signature of Chairman/HOD



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|----------------------------|----------------------------------|---------------------------------|
| PART - III CORE | Title : MOLECULAR BIOLOGY | Subject Code : 17 UBCC51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To explain and give examples of how ionic, hydrophobic, and hydrogen bonding interactions determine the structure of nucleic acids and proteins and modulate the specificity of binding between them.
- To distinguish between different molecular biology techniques that are used to isolate, separate, and probe for specific proteins, nucleic acids, and their interactions.
- To emphasize the molecular mechanisms of DNA replication, repair, transcription, protein synthesis, and gene regulation in different organisms.

UNIT I: Origin of Molecular biology and chemical basis of heredity: Prebiotic origin of Biomolecules, self replicating Biomolecules, chromatin structure and composition, structure of DNA and RNA.

UNIT II: Nucleic acid as the genetic material: classical experiments – Griffith experiment, Mc Avery and Claud, Methods of gene transfer – Transformation, Transduction – types and mechanism, conjugation.

UNIT III: Replication: Enzymology of DNA replication, models of replication – Sigma replication, (σ) Theta replication, DNA damage, DNA repair mechanism – Photo reactivation, Mismatch repair, Excision repair – Base excision, Nucleotide Excision.

UNIT IV: Transcription: initiation, elongation and termination of RNA transcription, post transcriptional modification, Regulation of transcription: concepts of operon – Lac operon – Inducers and repressors.

UNIT V: Introduction to Genetic code – Wobble Hypothesis, Translation – role of mRNA, rRNA, tRNA, initiation, elongation and termination of Protein synthesis, Post translational modification.

Text Books:

1. David friefielder (1990) **Molecular biology**, 2nd edition, Narosa Publishers.
2. Gardener EJ, Simmons MJ, Snustad DP (2006). **Principles of Genetics**, 8th edition, John Wiley and sons pvt. Ltd.



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Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Friefelder's essentials of Molecular biology - G.M.Malacinski - Pg.no: 17-76

Unit II: Friefelder's essentials of Molecular biology - G.M.Malacinski - Pg.no: 97-115

Unit III: Friefelder's essentials of Molecular biology - G.M.Malacinski - Pg.no: 118-143, 192 -214

Unit IV: Friefelder's essentials of Molecular biology - G.M.Malacinski - Pg.no: 146-163

Unit V: Friefelder's essentials of Molecular biology - G.M.Malacinski - Pg.no: 168-185

Reference books:

1. Benjamin Lewin (2003) Gene VIII, Benjamin Cummins publishers, United States edition.
2. Geoffrey M. Cooper, (2000) The cell A molecular approach, 4th edition, ASM Press.
3. Lodish *et al.*, (2003) Molecular cell biology, Scientific American press
4. Watson JD et al. (2004) Molecular biology of the gene, 5th edition, Pearson education.
5. Gerald Karp, (1996) Cell and Molecular Biology, 1st edition, John Wiley & sons.

Web site Links (E-learning resources)

- <https://ocw.mit.edu/courses/biology/7-012-introduction-to-biology-fall-2004/video-lectures/lecture-10-molecular-biology-1/>



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|----------------------------|---|---------------------------------|
| PART - III CORE | Title : GENERAL MICROBIOLOGY | Subject Code : 17 UBCC52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To explain relationships and apply appropriate terminology relating to the structure, metabolism, genetics, and ecology of prokaryotic microorganisms, eukaryotic microorganisms, and viruses.
- To explicate the interactions between opportunistic and pathogenic microorganisms and susceptible hosts in contacts that result in infection and/or disease and apply these interactions to disease symptoms.
- To elucidate the principles of physical and chemical methods used in the control of microorganisms and apply this understanding to the prevention and control of infectious diseases

UNIT I: Classification and organization: Introduction – History of Microbiology, Importance and applications of Microbiology. Outline classification of living organisms: Haeckel's, Whittaker and Carl Woese systems. Prokaryotes – General characteristics of bacteria, archaebacteria, rickettsias, mycoplasmas, cyanobacteria and actinomycetes. Ultrastructure of a bacterial cell: cell wall, cell membrane, ribosomes, nucleoid, Capsule, flagella, fimbriae, endospore and storage granules.

UNIT II: Nutrition, Growth and Reproduction: Microbial nutrition – nutritional requirements and uptake of nutrients by cells. Nutritional groups of microorganisms – autotrophs, heterotrophs. Bacterial growth – Growth curve, Factors influencing microbial growth. Reproduction – modes of reproduction – Binary fission, fragmentation, budding, conjugation, transformation, transduction and sporulation.

UNIT III: Microscopy: Principles and applications, resolving power, numerical aperture, types – dark field, bright field microscopy, phase contrast microscopy, fluorescent microscopy, electron microscopy, TEM and SEM.

UNIT IV: Applied microbiology: Food microbiology – spoilage, poisoning, food borne infections. Industrial microbiology – fermentation, use of microbes in industries, productions – organic acids (lactic acid and citric acid), antibiotics (penicillin and streptomycin). beer, wine. Microorganisms and milk – milk souring, alkali production, sweet curding. Fermented milk products – cheese, yoghurt, sauerkraut.

UNIT V: Agricultural and Medical microbiology: Plant growth – promoting microorganisms – mycorrhizae, rhizobia, Biofertilizers – *Rhizobium*. Plant diseases bacteria and viruses. Pathogenesis and prevention of air and water borne diseases – Typhoid, cholera, dysentery, Diarrhoea, hepatitis, amoebiosis, tuberculosis, pox diseases, diphtheria, poliomyelitis.



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Text Books:

1. Prescott, (2003) **Microbiology**, 6th edition, McGraw – Hill international.
2. Stainer, et al, (1993) **General Microbiology**, 5th edition, The Mac Milan press Ltd.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Microbiology- Prescott-6th edition pg.no: 1-14

Unit II: Microbiology- Prescott-6th edition pg.no: 94-102, 110-112 ,118-124

Unit III: Essentials of Microbiology- Dr S.Rajan Pg.no:79-92

Unit IV: Microbiology- Prescott-6th edition pg.no :937-958, 963-987

Unit V: Essentials of Microbiology- Dr S.Rajan Pg.no :531-570

References:

1. Davis et al, (1990) **Microbiology**, 4th edition J.B.Lippincott Company.
2. Pelczar, (1994) **Microbiology**, 5th edition, Tata Mc Graw Hill Publishing Company Ltd.

Web site Links: (E-learning resources)

- http://www.austincc.edu/rlewis3/docs/ch1_notes_intro.pdf
- <http://faculty.fiu.edu/~gantarm/Ch.%207%20Nutrition.html>
- <http://mgkmicro.com/BIOL257/Lecture5.pdf>
- <https://www.hccfl.edu/media/572066/microscopy.pdf>
- http://www.htskorea.com/tech/lightoptic/basic_microscopy.pdf
- www.mednotes.net/notes/microbiology/



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|----------------------------|--|---------------------------------|
| PART - III CORE | Title : IMMUNOLOGY AND IMMUNOTECHNOLOGY | Subject Code : 17 UBCC53 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To learn about the structural features of the components of the immune system as well as their functions.
- To gain knowledge about the mechanisms involved in immune system development and responsiveness.
- To understand the principles and applications of various immune-assay to evaluate the immune-status.

Unit I: Definition: Immunity, host resistance, antigen, antibody, leucocytes, lymphocytes etc., principles of Innate and acquired immunity, memory specificity – self / non self diversity – introduction to cells – [lymphocytes, monocytes, macrophages and granulocytes] and organs of the immune system – [bone marrow, thymus, spleen, lymph nodes, MALT, GALT.]

Unit II: Types of immunoglobulins – IgM, IgG, IgA, IgD and IgE – structure of antibody molecule – IgG only. Nature of antigens – immunogen and hapten – T dependent and T independent antigens. Complement Components: Definition, explanation and functions of complement components.

Unit III: Antigen – antibody interaction – agglutination – precipitation – immunodiffusion – immuno electrophoresis – radioimmunoassay – immunofluorescence – complement fixation – ELISA – production of antisera.

Unit IV: Blood group antigen – Rhesus – incompatibility – major histocompatibility complex – [type I & II and functions] autoimmune diseases (Graves, RA, Myasthenia gravis, SLE) – vaccines (Brief note) – immunodiagnostics.

Unit V: Hypersensitivity – types – mechanism – transplantation – graft rejection, tissue typing, immuno suppression, tumour antigen, cancer immunotherapy. Production of monoclonal antibodies and its applications.

Text Books:

1. Eli Benjamini., Richard. C., and Geoffrey S., (2003) **Immunology**, V Ed. John wiley & Sons, Inc., Hoboken, New Jersey.
2. Kuby, J. (2004) **Immunology**, V Edition. W.H. Freeman and Company, NY.
3. Roitt, I M, (2005) **Essentials of Immunology**, ELBS, Blackwell Scientific Publication.



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Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Immunology – Kuby- Pg.no: 24-55

Unit II: Immunology – Kuby- Pg.no: 76-101,299-307

Unit III: Immunology – Kuby- Pg .no:137-158

Unit IV: Immunology – Kuby- Pg .no: 161-177,413-428,462-477

Unit V: Immunology – Kuby- Pg .no: 363-387,481-496,501-516

Reference books:

1. Ian R. Tizard, (1995) **Immunology**, 4th edition, SAUNDERS college publication.
2. Richard M.Hyde (1997) **Immunology**, 3rd edition, B.I. Waverly Pvt.Ltd.

Reference books:

3. Abul K.Abbas (1998) **Cellular and Molecular Immunology**, 3rd edition, Harcourt Brace & Company.

Web site Links (E-learning resources)

- jeeves.mmg.uci.edu/immunology/CoreNotes/CoreNotesAll_11d.pdf



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|--------------------------------|------------------------------------|---------------------------------|
| PART - III ELECTIVE | Title : MEDICAL DIAGNOSTICS | Subject Code : 17 UBCE51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To foster a better understanding of how the clinical sciences are applicable to the diagnosing of disease.
- To acquire knowledge about the pathophysiology of diseases in five major areas of study: Clinical Chemistry, Immunology, Immunohematology, Medical Microbiology, and Hematology.
- To provide a solid theoretical foundation for further study in the healthcare-related professions.

UNIT I: Tissue function test: Biochemical tests of liver, kidney and pancreas, Significance of tissue function test.

UNIT II: Clinical Hematology: Abnormal hemoglobins (Hb-S, Hb-M, Hb-C and Hb-D), hemoglobinopathies – different types of anaemias, thalassaemias, disturbance of blood clotting mechanism, Diagnostic techniques for microbial infection.

UNIT III: Disorders associated with Renal and Liver transport: Glycosuria – renal glycosuria, hyperglycemic glycosuria, cystinuria, Fanconi syndrome, Crigglar – Najjar syndrome, Gilbert's disease, Dubin – Johnson disease.

UNIT IV: Diagnostic Enzymology: Liver marker enzymes – SGOT, SGPT, ALP, ACP, Heart marker enzymes – CPK, LDH.

UNIT V: Toxicology and Oncology: Toxicity of overdose of Drugs – Detoxification of poisons in Liver – phase I and phase II reactions, Estimation of poisons. Oncology – Carcinogenic substances, Formation and Diagnosis of Cancer, Malignant and Non – malignant tumors.

Text Books:

1. Chatterjee, (2005) **Text book of Medical biochemistry**, 6th edition, Jaypee brothers publication.
2. Lehninger, Nelson AL Cox, (2005) **Biochemistry**, 4th edition, W.H.Freeman and company, New York.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Text book of Medical biochemistry – Chatterjee . Pg.no: 572-593

Unit II: Medical laboratory Technology- Lanai L. Muherjee Pg.no: 491-500

Unit III: Text book of Medical biochemistry – Chatterjee . Pg.no: 468-481

Unit IV: Medical laboratory Technology- Lanai L. Muherjee Pg.no: 186-203

Unit V: Medical laboratory Technology- Lanai L. Muherjee Pg.no: 1094-1107

Reference books:

1. Devlin, (1997) **Text book of Biochemistry**, 4th edition, John Wiley and sons, INC Publications.
2. Donald Voet & Judith Voet, (2004) **Fundamentals of Biochemistry**, 3rd edition, Wiley International.
3. Lubert Stryer et al., (1999) **Biochemistry**, 4th edition, W.H.Freeman and company.
4. Murray.K, Meyes.P.A, Rodwell.V.W, (2003) **Harper's illustrated Biochemistry**, 26th edition, International edition, Mc Graw, Hill companies.

Web site Links: (E-learning resources): www.yourdiagnosis.com



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|--------------------------------|-------------------------------|---------------------------------|
| PART - III ELECTIVE | Title : BIOINFORMATICS | Subject Code : 17 UBCE52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To acquire knowledge about the fundamentals of evolution, molecular biology, molecular evolution and basic theory, application of programs used for database searching, protein and DNA sequence analysis, prediction of protein function, and building phylogenetic trees.
- To impart knowledge on basic techniques of Bioinformatics
- To emphasize the application of bioinformatics and biological databases to problem solving in real research problems.

UNIT I: Basics of internet, Computing and Information networks: Browsing, web, online journals – Pubmed. Brief account on database management system, HTTP, HTML and VRLS.

UNIT II: Introduction to Bioinformatics – Definitions and basic concepts, Genome projects, The role and applications of bioinformatics.

UNIT III: Biological databases: An introduction to NCBI, Sequence databases, sequence assembly, submission of sequence, Database browsers and search engines.

UNIT IV: Sequence Alignment: Pair wise Alignment – Dot matrix, dynamic programming algorithms, BLAST and FASTA, similarity searches, Multiple sequence Alignment.

UNIT V: Homology and diversity: Phylogeny – evolutionary basis of sequence alignment. Methods of Phylogeny analysis: Distance and character based methods.

Text Books:

1. David Mount.W, (2003) **Bioinformatics**, CBS Publishers & Distributors.
2. Attwood, T.K. and Parry – Smith .D.J, (2002) **Introduction to Bioinformatics**, Pearson Education private Ltd., Singapore.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Bioinformatics - David Mount.W- Pg.no: 2 -15

Unit II: Bioinformatics - David Mount.W- Pg.no: 20 -45

Unit III: Bioinformatics - David Mount.W- Pg.no:283-326

Unit IV: Bioinformatics - David Mount.W- Pg.no:53-192

Unit V: Bioinformatics - David Mount.W- Pg.no:238-278

Reference books:

1. Arthur M.Lesk, (2008) **Introduction to Bioinformatics**, Oxford University Press.
2. Howard parish.J, Richard M. Twyman, (2002) **Instant Notes in Bioinformatics**, Bios Scientific publishers Ltd.

Web site Links: (E-learning resources)

- bioinfo.mbb.yale.edu/mbb452a/intro <https://www.ncbi.nlm.nih.gov/>



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| | | |
|----------------------------|--|---------------------------------|
| PART - III CORE | Title : Core Practical – III Lab in Microbiology & Immunology | Subject Code : 17 UBCCP3 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To understand the basic concepts of microbiology with an emphasis on sterile technique, microscopy, isolation and cultivation of microorganisms.
- To provide an introduction to experimental design and basic techniques commonly used in immunology research laboratories.

1. Cleaning of glass wares.
2. Preparation of simple culture media.
3. Selection of suitable culture medium.
4. Gram's staining, motility – Hanging drop method.
5. Isolation of microbes from soil – serial dilution, plating techniques
6. Enumeration of *E.coli* in milk and ice cream.
7. Water quality analysis – presence of Coliform test.
8. RBC, WBC count.
9. Blood grouping.
10. Immunodiffusion

Demonstration:

1. ESR – Erythrocyte sedimentation rate.
2. Separation of proteins by SDS – PAGE.
3. Heamagglutination
4. Identification of nucleic acids by Agarose Gel Electrophoresis.
5. Separation of amino acids by Paper Chromatography, TLC

Reference books:

1. Gunasekaran.P, **Lab Manual in Microbiology**. New age International Pvt Ltd.
2. Harold J.Benson., **Microbiological Applications**, 7th Edition, WCB McGraw - Hill Publication.



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VI SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hours /Week | Duration of exams | C A | SE | Tot | Crd |
|--------------|--------------|---------------------|--|-------------|-------------------|-----|----|------------|-----------|
| 1 | 17UBCC61 | Part-III Core | Biotechnology & Genetic Engineering | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 17UBCC62 | Part-III Core | Plant Biochemistry | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 17UBCC63 | Part-III Core | Clinical Biochemistry | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UBCC64 | Part-III Core | Food Processing Technology | 5 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17UBCE61 | Part-III Elective 1 | Endocrinology and hormonal regulations | 5 | 3 | 25 | 75 | 100 | 5 |
| 6 | 17UBCCP4 | Part-III Core Lab | Lab in Clinical Biochemistry | 5 | 3 | 40 | 60 | 100 | 4 |
| 7 | 16UGKB61 | Self Study | General Knowledge | - | - | - | - | 100 | - |
| TOTAL | | | | 30 | | | | 700 | 25 |

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Signature of Chairman/HOD



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|----------------------------|--|---------------------------------|
| PART - III CORE | Title : BIOTECHNOLOGY & GENETIC ENGINEERING | Subject Code : 17 UBCC61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To comprehend the basic molecular biological concepts and techniques used in the fields of biotechnology and genetic engineering.
- To provide a theoretical base to properties and applications of versatile DNA modifying enzymes, cloning strategies, vector types, host genotype specificities for selection and screening of recombinants and/or recombinant transformants.
- To acquire knowledge about main engines of implementation and transmission of a genetic material at molecular and cellular levels, and also methods of change of a genetic material and construction of transgenic organisms with the given properties.

UNIT I: Genetic engineering: Introduction to Gene manipulation – restriction enzymes and DNA ligases, Introduction to gene cloning, Types of cloning vectors – plasmid, phagemid, cosmid, lambda phage, M13 phage, BAC, YAC.

UNIT II: Plant biotechnology: Agrobacterium mediated gene transfer, transgenic plants and its applications, crop improvement.

UNIT III: Animal biotechnology: Introduction to cell culture and cell lines. Viral vector system – Baculo viral vector, Methods for producing transgenic animal – Microinjection, Electroporation, Gene gun method, Invitro fertilization and embryo transfer, Application of transgenic animals.

UNIT IV: Microbial biotechnology: Basic principles of microbial growth, types, design and operation of fermentors, Microbial degradation of oil spills, Biodegradable plastics - PHB production.

UNIT V: Production of recombinant proteins: Insulin, Interferon, and vaccines. Treatment of various human disorders – Gene therapy.

Text Books:

1. Dubey, (2005) **A Text Book of Biotechnology**, 1st edition, S .Chand & Company Ltd.
2. Das H.K., (2004) **Text book of Biotechnology**, 1st edition, Wiley Dreamtech India pvt. Ltd.
3. Santhya Mithra (2015) **Genetic Engineering**, McGraw-Hill Publications.



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Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Gene cloning and DNA analysis – T.A.Brown - Part – I – pg.no.3-147

Unit II: Principles of Gene manipulation - S.B. Primrose and R.M. Twyman- part-II – pg.no. 274-296

Unit III: Principles of Gene manipulation - S.B. Primrose and R.M. Twyman- part-II – pg.no. 218-245

Unit IV: Principles of Gene manipulation - S.B. Primrose and R.M. Twyman- part-IV – pg.no.508-532

Unit V: Principles of Gene manipulation - S.B. Primrose and R.M. Twyman- part-IV – pg.no. 540-545

Reference books:

1. Balasubramanian et.al., (2003) Concepts in Biotechnology, Revised edition, university Press.
2. Freifelder, D., (1982) Physical Biochemistry: Applications to biochemistry and molecular biology, 2nd edition, Narosa Publications.
3. Old R.W., and Primrose S.B., (2005) Principles of Gene manipulation, 5th edition Blackwell science.

Web site Links (E-learning resources)

- www.biologydiscussion.com > ... > Notes on Genetic Engineering



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| PART - III CORE | Title : PLANT BIOCHEMISTRY | Subject Code : 17 UBCC62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To provide an insight about the biochemical processes that take place in plant such as plant metabolic processes, photosynthetic reactions, plant secondary metabolites and the metabolic pathways, plant hormones and the use of plant in traditional medicine.
- To acquire knowledge about the identification and uses of plant secondary metabolites like alkaloids, phenolic acids, flavonoids, tannins, saponins in the production of pharmaceuticals, food supplements and nutraceuticals.

UNIT I: Introduction: Occurrence, Classification, Structure and function of naturally occurring pigments – chlorophylls, carotenoids, flavones and flavonols.

UNIT II: Photosynthesis: Photosynthetic apparatus and Photosynthetic pigments, light reaction – photophosphorylation – cyclic and non-cyclic Phosphorylation, dark reaction – Calvin cycle, C4 and CAM plants, Photorespiration, Factors affecting Photosynthesis.

UNIT III: Plant nutrition: essential mineral nutrients – function, effects of toxicity and deficiency, nitrogen cycle, nitrogen fixation – symbiotic and asymbiotic nitrogen fixation, nitrogen assimilation, sulphate assimilation.

UNIT IV: Plant growth regulators: Natural growth hormones – Auxin, GA, cytokinins, Ethylene and ABA, Synthetic growth hormones – IAA, IBA, 2, 4-D.

UNIT V: Plant physiology and Reproduction: Brief account on biological membrane transport mechanisms and physiology of Germination, Dormancy, Photoperiodism, Vernalization, Plant tissue culture – Brief account on methodology and application.

Text Books:

1. Srivastava H.N., (2004) **Plant physiology**, 1st New millennium edition, Pradeep publications.
2. James Bonner & Joseph E. Varner, (1976) **Plant Biochemistry** 3rd edition, AP Publishers.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Modern Methods in Plant Physiology- G. C. Srivastava – Chapter –1 –Pg.no.1-11

Unit II: Modern Methods in Plant Physiology- G. C. Srivastava – Chapter –10–Pg.no.114-130

Unit III: Plant Physiology – S.N.Pandey & B.K.Sinha – Part-IV- Page.no.104-120

Unit IV: Plant Physiology – S.N.Pandey & B.K.Sinha – Part-IV- Page.no.392-429

Unit V: Plant Physiology – S.N.Pandey & B.K.Sinha – Part-IV- Page.no.430-442,447-454

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Reference books:

1. Hans – Walter Hedlt (2005) **Plant Biochemistry**, Academic press, third edition.
2. William G.Hopkins, (1999) **Introduction to Plant Physiology**, 2nd edition John wiley & sons.
3. Frank. B.Salisbury, & Cleon, W. Ross (1995) **Plant physiology**, 3rd edition, CBS Publishers & distributors.
4. Ray Noggle. G & George J. Eritz, (1991) **Introduction to Plant Physiology**, 2nd edition, Prenliee Hall of India Pvt Ltd.

Web site Links (E-learning resources)

- [http://www.freebookcentre.net/biology-books-download/Lecture-Notes-on-PLANT-BIOCHEMISTRY-\(PDF-116P\).html](http://www.freebookcentre.net/biology-books-download/Lecture-Notes-on-PLANT-BIOCHEMISTRY-(PDF-116P).html)



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|----------------------------|--------------------------------------|---------------------------------|
| PART - III CORE | Title : CLINICAL BIOCHEMISTRY | Subject Code : 17 UBCC63 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To gain a sound knowledge of the clinical principles underlying the application of clinical biochemistry investigations in human disease.
- To comprehend the intermediates of metabolism, their reactions, the control mechanisms of metabolism and the common disorders of metabolism.

UNIT I: Introduction: Scope, Development and Applications of Clinical Biochemistry, Laboratory investigation in Clinical Biochemistry – Evaluation of Laboratory test, Normal range, system of international units.

UNIT II: Disorders of Carbohydrates Metabolism: Glucose level in normal blood – Hypoglycemia, Hyperglycemia, glycosuria, Diabetes mellitus, obesity, galactocemia, glucose tolerance test, inborn errors of Carbohydrate metabolism – Lactose intolerance, Glycogen storage disease, Carbohydrates Metabolism in starvation.

UNIT III: Disorders of Lipid metabolism: Atherosclerosis, Fatty Liver, Inborn errors of lipid metabolism – Hypo Lipoproteinemias, Hyper Lipoproteinemias and Disorders associated with Cholesterol, triglycerides, phospholipids, lipid metabolism in starvation.

UNIT IV: Disorders of Amino acid and Protein Metabolism: Disorders of Plasma protein, urea – Uremia, Uric acid – Uremia, Creatinine, Ammonia, Inborn errors of Amino acid metabolism – Phenylketonuria, alkaptonuria, Amino acid metabolism in starvation.

UNIT V: Disorders of Nucleic acid metabolism: Purine and pyrimidine metabolism – Gout – primary Gout and Secondary Gout, LNS, Orotic aciduria, Xanthinuria.

Text Books:

1. Chatterjee, (2005) **Text book of Medical Biochemistry**, 5th edition, JAYPEEE brothers publication.
2. Tietz (2003) **Fundamental of Clinical Biochemistry**, 5th edition, Saunders, An imprint of Elsevier.
3. Vasudevan (2007) **Text Book of Biochemistry for Medical Students**, 5th Edition, Jaypee Publications.



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Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 512-516,561-565

Unit II: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 266-329

Unit III: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 380-395

Unit IV: Text book of Medical biochemistry-M.N.Chatterjee- Page.no 403-467

Unit V: Text book of biochemistry-D.M.Vasudevan&S.Sreekumari- Page.no 262-277

Reference books:

1. Guyton, (2008) Text book of Medical Physiology, 11th edition, Elsevier Publications.
2. Harold Varley (1991) Practical Clinical Biochemistry, 5th edition. CBS Publications.
3. Robert K.Murray et al., (2003) Harper's Biochemistry, 26th edition, Mc Graw Hill company.
4. Fauci et al, (1998) Horizons Principles of Internal Medicine, 14th edition, Mc Graw-Hill Health professions division.

Web site Links: (E-learning resources)

- <https://leseprobe.buch.de/images-adb/b9/f4/b9f4d996-29df-4798-a013-52f871bf18e1.pdf>



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|----------------------------|---|---------------------------------|
| PART - III CORE | Title : FOOD PROCESSING TECHNOLOGY | Subject Code : 17 UBCC64 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To impart knowledge about food processing and various unit operations involved in it, packaging, storing and preservation, food poisoning, food related hazards and safety, and transportation.
- To understand of the advanced principles of food processing and how to choose a method of preservation in relation to food composition.

UNIT I:INTRODUCTION: Definition – function of food – food groups – Bio-fortification – Nutraceuticals – low cost nutrient supplement – Food fortification.

UNIT II:CEREALS AND PULSES: Grain characteristics and plant products – Wheat milling process – products of wheat – Rice processing. Pulses – processing – Fermentation and Germination.

UNIT III:FRUITS AND VEGETABLES: Structure, composition, physiological and biochemical changes during ripening, handling and storage – processing of vegetables – citrus juice, grape juice and raisins, squashes, jam, ketchups.

UNIT IV:MILK AND MILK PRODUCTS: Milk processing – Pasteurization, homogenization, packing – fortified milk, skim milk – cream, butter, cheese, ice-cream, paneer, yogurt.

UNIT V:MEAT, FISH AND EGGS: Aging, tenderizing, freezing – storage. Fish preservation and processing – dehydrated egg, powder, frozen egg – egg storage.

Text Books:

1. Sivasankar. B (2000) **Food processing and preservation**, 1st edition, PHI learning private limited.
2. Srilakshmi. B, (2011) **Food Science**, 5th edition, New age international Pvt ltd.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: <http://www.preservearticles.com/201105156691/what-are-the-most-essential-functions-of-food.html>
https://en.wikipedia.org/wiki/Food_group
<https://en.wikipedia.org/wiki/Biofortification>
<https://en.wikipedia.org/wiki/Nutraceutical>
https://en.wikipedia.org/wiki/Food_fortification

Unit II: Food processing and preservation – B.Sivasankar – Chapter -21 – pg. no. 284-295

Unit III: Food processing and preservation – B.Sivasankar – Chapter -20 – pg. no.267-283

Unit IV: Food processing and preservation – B.Sivasankar – Chapter -19 – pg. no.253-266

Unit V: Food processing and preservation – B.Sivasankar – Chapter -22 – pg. no.296-307

Reference books:

1. Swaminathan, M., (2010) **Advanced text Book on Food and Nutrition**, Volume I & II , The Bangalore printing and publishing co Ltd.

Web site Links: (E-learning resources)

- cdam.minam.gob.pe/multimedia/iiap/documentos/pdf/piba/pu/12.pdf

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|--------------------------------|---|---------------------------------|
| PART - III ELECTIVE | Title : ENDOCRINOLOGY AND HORMONAL REGULATIONS | Subject Code : 17 UBCE61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

- To explain the roles of the endocrine system in maintaining homeostasis, integrating growth and development, responding to environmental insults and promoting successful reproduction.
- To acquire knowledge related to the major hormones released from the hypothalamus, pituitary, and target gland/organ that are clinically important in regard to thyroid, adrenal, and reproductive function.
- To identify the physiology, principle of measurement, reference ranges and clinical correlations of chemical constituents of the blood.

Unit I Endocrine Systems and Hormones: Definition, classification, biosynthesis and degradation. Mechanism of hormone action, class I and II hormone receptors, steroids. Feedback regulation of hormones.

Unit II Hypothalamus and pituitary hormones: Hypothalamic releasing factors vasopressin, oxytocin. Biosynthesis, secretion, transport, regulation and biological effects of growth hormones, FSH, LH, TSH, ACTH and prolactin.

Unit III Thyroid hormones: biosynthesis, secretion, transport, regulation and biological actions. Hypo and hyper thyroidism, antithyroid agent's role of parathyroid hormones, calcitriol, calcium and phosphorous homeostasis. Hypo and hyperparathyroidism.

Unit IV Pancreatic hormones: Islets of Langerhans, cell types. Insulin and glucagon: biosynthesis, mechanism of action and biological effects. Hormonal action of somatostatin and pancreatic polypeptide.

Unit V Adrenal hormones: biosynthesis, secretion, transport, mechanism of action and excretion of glucocorticoids, mineralocorticoids, adrenal medullary hormones - epinephrine and nor epinephrine, steroid hormones - androgens and estrogens.

Text Books:

1. Harold Varley (1991) **Practical Clinical Biochemistry**, 5th edition. CBS Publications.
2. Murray RK, Granner AK, Mayes PA, Rodwell VW (2003). **Harper's Illustrated Biochemistry**, 26th edition, McGraw-Hill Book Company.

Chapters and sections (For UNIT-I, II, III, IV and V)

Unit I: Endocrinology – M.E.Hadley - Chapter: 2 – pg.no. 16-34

Unit II: Endocrinology – M.E.Hadley - Chapter: 6– pg.no. 112-131

Unit III: Endocrinology – M.E.Hadley - Chapter: 13 – pg.no. 312-325

Unit IV: Endocrinology – M.E.Hadley - Chapter: 11 – pg.no. 250-272

Unit V: Endocrinology – M.E.Hadley - Chapter: 15 – pg.no. 362-391



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Reference books:

1. White A, Handler P, Smith E, Stetten D.,Jr. (1964). Principles of Biochemistry, 3rd edition, McGraw-Hill Book Company.
2. Frisell WR (1982). Human Biochemistry, 1st edition, Macmillan Publishing Company.
3. Guyton, (2008) Text book of Medical Physiology, 11th edition, Elsevier Publications.
4. Wilson and Foster, Editors (1992). Williams Textbook of Endocrinology, 8th edition, WB Saunders.
5. Harrison (2011) Internal Medicine, 18th Edition, McGraw-Hill Publications.

Web site Links(E-learning resources)

- <https://www.mrcpass.com/Notes/Endocrinology%20Notes.pdf>



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|----------------------------|---|---------------------------------|
| PART - III CORE | Title : Core Practical – IV Lab in Clinical Biochemistry | Subject Code : 17 UBCCP4 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To acquire knowledge about biochemistry and pathophysiology associated with tests performed in a clinical biochemistry laboratory
- To identify and interpret common result patterns related to pathophysiology in relation to routine clinical biochemistry
- To comprehend the principles of the analytical instruments in use in the routine clinical laboratory

Blood Analysis:

1. Estimation of Glucose by Phenol-Sulphuric acid method
2. Estimation of urea by Dam's method
3. Estimation of Cholesterol by Zak's method
4. Estimation of Uric acid by Caraway's method
5. Estimation of protein by Lowry's method
6. Estimation of Creatinine by Alkaline picrate method

Urine Analysis:

1. Qualitative analysis of Normal urine and Abnormal urine (sugar, urea, creatinine, uric acid, ammonia, protein)

Estimation of Enzymes:

1. Alkaline phosphatase
2. SGOT
3. SGPT

Reference books:

1. Harold Varley, (1991) Practical clinical biochemistry, 5th edition, CBS Publications.
2. Carl A. Burtis & Co, Tietz (2006) Text book of Clinical chemistry and Molecular Diagnostics, 4th edition, Elsevier Publication
3. Ochei J., and A. Kolhatkar, (2000) Medical laboratory science, Tata Mc Graw Hill publication.



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I SEMESTER

| Sl. No | Part | Subject Code | Subject Title | Hrs/week | Exam hrs | C A | S E | Tot | Cr d |
|--------|--------------|----------------------|--|----------|----------|-----|-----|-----|------|
| 1 | I | 17UACT11/ H11/S11 | Tamil/Hindi/ Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | II | 17 UAC E11 | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | III Core | 17 UIT C11 | Programming in C | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | III Core | 17 UIT CP1 | Programming in C - Lab | 4 | 3 | 40 | 60 | 100 | 3 |
| 5 | IV Allied | 17 UIT A11 | Statistics | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | IV SBS | 17 UIT S11 | Introduction of Information system | 3 | 3 | 25 | 75 | 100 | 3 |
| 7 | IV | 14UAC VE1 | Value Education | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 22 |

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|----------------------------|-------------------------------------|----------------------------------|
| PART - III CORE | Title : PROGRAMMING IN C | Subject Code : 17 UIT C11 |
| Semester : I | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To know the basic of C Language
2. To understand about control and looping statements.
3. To understand about arrays, structure and files in C language

UNIT-I: Basic Structure of C Program - Constants, Variables and Data types : Character set – C tokens – Keywords and Identifiers – Constants – Variables - Data types – Declaration of variables and storage class – Assigning values to variables - Defining Symbolic Constants – Declaring variable as constants.

UNIT-II: Operators and Expressions : Arithmetic , Relational , Logical , Assignment , Increment and Decrement , Conditional , Bitwise , Special operators – Arithmetic Expression – Evaluation of Expressions – Operator Precedence and Associative. **Managing Input and Output Operations :** Reading and Writing a character – Formatted input and output.

UNIT-III: Decision making and Branching : If statement-simple If –If-Else-Nested If-Else –Else If Ladder-Switch statement-Conditional ?: Operator-GoTo Statement. Decision making and Looping: WHILE statement- DO Statement – FOR statement. **Arrays:** One-Dimensional Arrays-Declaration of One-Dimensional arrays – Initialization of One-Dimensional arrays- Two Dimensional arrays-Initializing Two Dimensional Arrays-Multi Dimensional arrays.

UNIT-IV: Character arrays and Strings : Declaring and Initializing String Variables- Reading Strings-Writing Strings-Arithmetic operations on characters-putting strings together-Comparison of Two strings-String Handling functions.

User Defined Functions: Definition of Functions-Return values and their types-Function calls-Function Declaration- Category of Function- Recursion.

UNIT-V:Structures and Unions : Defining-Declaring Structure variables-Accessing structure members – Arrays of structures-Arrays within structures – Unions.File Management: Defining and Opening a File-Closing a File –I/O operations on Files.

TEXT BOOK(S):

1. Programming in ANSI C – E. Balagurusamy - Fourth Edition – Tata McGraw Hill.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit - I:- Chapter 1 – 1.8 , Chapter 2 – 2.2 to 2.12

Unit-II: Chapter 3: 3.1 to 3.11 & 3.15,Chapter 4: 4.2 to 4.5

Unit-III: Chapter 5: 5.2 to 5.9 Chapter 6:6.2 to 6.4, Chapter 7:7.1 to 7.7

Unit-IV: Chapter 8: 8.2 to 8.8 Chapter 9: 9.5 to 9.13 & 9.16.

Unit-V: Chapter 10:10.2 to 10.4,10.8,10.9,10.12 Chapter 12: 12.2 to 12.4

REFERENCE BOOKS:

1. Programming in C – Radha Ganeshan- Scitech Publication
2. Programming with C – Smarajith Gohsh – Phi Publication

Web site Links: (E-learning resources)

<http://www.cprogramming.com>, www.codingunit.com



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|----------------------------|---|---------------------------------|
| PART - III CORE | Title : PROGRAMMING IN C LAB | Subject Code : 17UIT CP1 |
| Semester : I | HOURS : 4 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To know the Basic Programming in C.
2. To understand about the Programming in Control statements, Looping Statements.
3. To understand about the Programming in Arrays, Structures and Files

Simple Programs:

1. Write a C Program for Addition of Two numbers
2. Write a C Program for Swapping Two numbers.
3. Write a C Program to find Simple Interest and Compound Interest.

Control Statements (if , if – else , if .. else .. elseif)

4. Write a C Program to find the Biggest of Three Numbers.
5. Write a C Program to Check the given number is Positive , Negative and Zero.
6. Write a C Program to Check the given number is ODD or EVEN.
7. Write a C Program to Calculate the Sales and Commission.
8. Write a C Program to Calculate EB-Bill .

Looping Statement (for , While , do-while ,Switch..Case)

9. Write a C Program to find the Factorial of a given Limit.
10. Write a C Program to Generate Fibonacci Series.
11. Write a C Program to Generate Multiplication Table.
12. Write a C Program to Check the given number is ADAM or NOT.
13. Write a C Program to Check the given number is ARMSTRONG or NOT.
14. Write a C Program to find the Sum of Digits , Sum of Series , Reverse the number using Switch Case.

Arrays and Strings :

15. Write a C Program for Addition of Two Matrices.
16. Write a C Program for Transpose of a Matrices.
17. Write a C Program for Multiplication of Two Matrices.
18. Write a C Program for Ascending Order.
19. Write a C Program for Searching Number
20. Write a C Program for Counting Vowels in a given String.
21. Write a C Program for arranging the Names in Ascending Order

Structures and Funtion.

22. Write a C Program for swapping two number using call by value and call by references.
23. Write a C Program for Calculating Marks of a student using Structure

Files:

24. Write a C Program for Writing a Employee Salary in a File
25. Write a C Program for Reading a Employee Salary as a Process File



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|------------------------------|-------------------------------|---------------------------------|
| PART - III ALLIED | Title : STATISTICS | Subject Code : 17UIT A11 |
| Semester : I | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To understand about review of data.
2. To understand about collection analysis, and interpretation of numerical data.
3. To summarize data from mean or standard deviation

UNIT-I: CENTRAL TENDENCIES

Introduction – Arithmetic Mean (AM) - Partition values (Media , Quatiles , Deciles and Percentiles) – Mode – Geometric Mean and Harmonic Mean.

UNIT-II: MEASURES OF DISPERSION

Introduction – Measures of Dispersion – Range – Quartile Deviation – Mean Deviation – Standard Deviation.

UNIT-III: Coefficient of DISPERSION

Coefficient of dispersion – Coefficient of variation – relative advantage of different measure of dispersion – Moments – Skewness – Kurtosis.

UNIT-IV: CURVE FITTING:

Introduction – Principles of least squares – fitting of a straight line – fitting of second degree parabola

UNIT-V: CORRELATION AND REGRESSION:

Introduction - Correlation – Karl pearson Coefficient of correlation – Rank Correlation – Repeated ranks – Regression – lines of regression

TEXT BOOK(S):

Statistics - Dr. S. Arumugam ,Thangapandi ,Issac

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I - Chapter 2(2.0 to 2.4) Page : 11-56

Unit II - Chapter 3(3.0 to 3.2) Page: 60 - 76

Unit III - Chapter- 4(4.0, 4.2) Page: 82 - 91

Unit IV - Chapter-5(5.0,5.1) Page: 95 - 104

Unit V - Chapter 6.0,6.1,6.2,6.3 (Lines of regression and related problem only) Page : 106 – 141

REFERENCE BOOKS:

STATISTICAL METHODS by S.P.GUPTA, SULTAN CHAND AND SONS 2004

Web site Links: (E-learning resources)

<https://statistics.laerd.com/statistical-guides>

<http://www.statpac.com/statistics-calculator>



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|--------------------------------|---|----------------------------------|
| PART - IV SBS | Title:INTRODUCTION OF INFORMATION SYSTEM | Subject Code : 17 UIT S11 |
| Semester : I | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To Study about basic of a Computer.
2. To Study about the Input and Output Devices
3. To Study about Telecommunication and Network.

UNIT-I: Introduction to Computers: Introduction – Importance of Computers – Characteristics of Computer – Uses of Computers – Overview of Computer System – Parts of a Computer – Importance of Hardware – **Classification of Computers:** Introduction – Portable computers – Personal Computers – Workstations – minicomputers – mainframes – Super Computer – Comparison of Computers – **Central Processing Unit:** Introduction – CPU – Memory – Registers – Instruction set – Machine Cycle – How the CPU and Memory work

UNIT-II: Computer Memory: Introduction –Random Access Memory – Read Only Memory – **Secondary Storage Devices:** Introduction – Classification of Secondary Storage Devices – Advantages of Secondary Storage Devices – Magnetic Disks – Optical Disks – Magnetic Tape – Zip Disk – Jaz Disk – Super Disk – MO Disk.

UNIT-III: Input Devices and Technologies: Introduction – keyboard – Mouse – Trackball – Game Controllers – Scanners – Barcode Reader –OCR – Digitizer – Voice Recognition – web Cams – Digital Camera – Video Cameras - **Output Devices and Technologies:** Introduction – Monitor – Printer – Plotter.

UNIT-IV: Computer Software: Introduction – What is Computer Software – Classification of Software – Operating System – Utilities – Compilers and Interpreters – **Programming Language :** Introduction – Machine Language – Assembly Language – High Level Language – Types of High Level Language.

UNIT-V: Telecommunication and Network: Introduction – Telecommunication Process – Communication Process – Communication Media – Characteristic of Communication Media – Types of Networks – Network Topologies – Network Protocols.

TEXT BOOK(S):

Introduction to Information Systems Alexis Leon and Mathews Leon Mc Graw Hill Education Second Reprint 2009.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I: Page 17-28 , 29 – 37 , 38 – 47

Unit II : Page 51-56 , 57-68

Unit III: Page 71-84 , 87-98

Unit IV: Page 101,105,106,113-122

Unit V: Page 143 – 161

REFERENCE BOOKS:

1. Introduction to Computers, Peter Norton, sixth edition, Mc-Graw Hill Companies.
2. Fundamental of Computer, V.Rajaraman Fifth edition, Kindle Edition



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II SEMESTER

| Sl. No | Part | Subject Code | Subject Title | Hrs/ week | Exam hrs | C A | S E | Tot | Crd |
|--------|---------------|----------------------|--|-----------|----------|-----|-----|-----|-----|
| 1 | I | 17UACT11/ H11/S11 | Tamil/Hindi/ Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | II | 17 UAC E21 | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | III Core | 17 UIT C21 | Object Oriented Programming in C++ | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | IV Core | 17 UIT CP2 | Programming in C++ Lab | 4 | 3 | 40 | 60 | 100 | 3 |
| 5 | III Allied | 17 UIT A21 | Digital Principles and Applications | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | IV SBS | 17 UIT S21 | Data Structures | 3 | 3 | 25 | 75 | 100 | 3 |
| 7 | IV | 14 UAC ES1 | Environmental Studies | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 22 |

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Signature of Chairman/HOD



| | | |
|----------------------------|---|----------------------------------|
| PART - III CORE | Title : Object Orient Programming in C++ | Subject Code : 17 UIT C21 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To know the Basic of C++.
2. To understand about Class and Objects in C++.
3. To understand about various inheritance

UNIT-I: Principles of Object Oriented Programming (OOP):

Software Evolution – OOP Paradigm – Basic Concepts of OOP – Benefits of OOP- Object Oriented Languages – Application of OOP – Introduction to C++- tokens, keywords, identifiers, variables, Operators, manipulators, expressions and Control structures in C++.

UNIT-II: Functions: Functions in C++ - Main Function – Function Prototyping – Call by reference- return by reference – function overloading – Friend and virtual functions.

Classes and Objects: Defining Member Functions – Making an outside Function Inline – Nesting of Member Functions- Private Member Function – Arrays within a Class – Static Member Functions – Arrays of Object – Friend Functions.

UNIT-III: Constructors and Destructors:

Introduction – Constructors – Parameterized Constructors – Constructors with Default Arguments – Copy constructors – Dynamic Constructors - .Destructors.

Operator Overloading and Type Conversions: Defining Operator Overloading – Overloading Unary Operators, Binary Operators – Rules for Overloading Operators – Type Conversions.

UNIT-IV: Inheritance:

Single inheritance – Multilevel Inheritance – Multiple inheritance- Hierarchical Inheritance – Hybrid Inheritance – Pointers, virtual functions and polymorphism, Managing I/O operations.

UNIT-V: Working with files:

Classes for file stream operations – Opening and closing a file – Detecting End of file – File pointers – Updating a file – Error Handling during file operations- command line arguments

TEXT BOOK(S):

Object Oriented programming with C++-E.Balagurusamy, Tata McGrawHill, NewDelhi.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit -I: Chapter 1: 1.2, 1.4, 1.5, 1.6, 1.7, 1.8 Chapter 3: 3.1, 3.2, 3.3, 3.4, 3.10, 3.13, 3.19, 3.24

Unit-II: Chapter 4: 4.2, 4.3, 4.4, 4.5,4.9, 4.10 Chapter 5: 5.4, 5.6, 5.7, 5.8, 5.9, 5.12, 5.13, 5.15

Unit-III: Chapter 6: 6.1, 6.2, 6.3, 6.4, 6.7, 6.8, 6.11 Chapter 7: 7.2, 7.3, 7.4, 7.7, 7.8

Unit-IV: Chapter 8: 8.3, 8.5, 8.6, 8.7, 8.8. Chapter 9: 9.1 to 9.6 Chapter 10: 10.1 to 10.6

Unit-V: Chapter 11: 11.2, 11.3, 11.4, 11.5, 11.6,11.8,11.9, 11.10

REFERENCE BOOKS:

P.Radha Ganesan, “ Programming Skills in C++”, scitech publications.

Fundamentals of Programming C++”, written by Richard L. Halterman,

Web site Links: (E-learning resources)

<http://www.cplusplus.com/doc/tutorial/>

<https://www.tutorialspoint.com/cplusplus/>



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|----------------------------------|---------------------------------------|---------------------------------|
| PART - III CORE | Title : Programming in C++ LAB | Subject Code : 17 UITCP2 |
| Semester : II | HOURS : 4 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To understand about programming in C++
2. To understand about programming in OOPs.
3. To understand about programming in File.

Basic Programs (control statements , looping statement , functions)

1. Write a C++ Program for Calculating Simple Interest Inline Function
2. Write a C++ Program Calculating EBBILL.
3. Write a C++ Program Check the Given number is Positive , Negative or Zero
4. Write a C++ Program Check Pass or Fail for a Student Marks
5. Write a C++ Program to Generate Fibonacci Series.
6. Write a C++ Program for Constructor and Destructor.
7. Write a C++ Program for friend function.

Classes and Objects (inside the class and outside the class)

8. Write a C++ Program for accessing the class inside.(Student Marks)
9. Write a C++ Program for accessing the class from outside.(Student Marks)

Function Overloading & Operator Overloading

10. Write a C++ Program for Function Overloading.
11. Write a C++ Program for Binary Operator.
12. Write a C++ Program for Unary Operator.

Inheritance

13. Write a C++ Program for Single Inheritance in Student Mark.
14. Write a C++ Program for Multi Level Inheritance in Employee Payroll
15. Write a C++ Program for Multiple Inheritance in Employee Payroll.

Files

16. Write a C++ Program for Creation of a File
17. Write a C++ Program for Processing a File.



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| | | |
|------------------------------|--|---------------------------------|
| PART - III ALLIED | Title : DIGITAL PRINCIPLES AND APPLICATIONS | Subject Code : 17 UITA21 |
| Semester : II | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To know the number systems.
2. To understand the basic concepts of binary operations.
3. To know the digital circuits inside the computer.

UNIT-I:

Binary Numbers – binary to decimal – decimal to binary – octal – hexa decimal – ASCII code – Excess-3 code – Gray Code.

Unit-II

Basic gates - Inverter – OR gates – AND gates –Universal Logic gates- NOR gates – NAND gates –Boolean Laws and Theorems

Unit –III:

Sum of product method – K-Map truth tables – Pairs, Quads , Octets – K-Map simplifications – Don't care – product of sum method – product of sum simplification.

UNIT-IV:

Multiplexers – Demultiplexers – 1- of - 16 Decoders- BCD-to-Decimal Decoder – 7 segment decoders – Encoders – Exclusive-OR gates – parity generators – checkers.

UNIT-V:

Binary Addition – Binary Subtraction – 2's & 1's complement representation – Complement Arithmetic – Arithmetic building blocks- Flip-flops: Edge triggered RS Flip-flop-Edge triggered JK Flip-flop

TEXT BOOK(S):

Digital Principles and Applications - Albert Paul Malvino & Donald P. Leach – Seventh Edition , Tata McGrawHill Edition 2002 , New Delhi

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

- Unit I – Chapter 5 – 5.1 to 5.8
- Unit II – Chapter 2 – 2.1 to 2.3 Chapter 3 – 3.1
- Unit III – Chapter 3 – 3.2 to 3.8
- Unit IV – Chapter 4 – 4.1 to 4.8
- Unit V – Chapter 6 – 6.1 to 6.7 Chapter 8 – 8.3 , 8.5

REFERENCE BOOKS:

1. Tocci R.J. Widmer N.S. "Digital Systems: Principles and Applications" Eighth Edition, Pearson Education (singapore) Pvt Ltd Reprint 2004.
2. Floyd. Digital Fundamentals 8/e, Pearson Education Reprint 2006

Web site Links: (E-learning resources)

- https://www.tutorialspoint.com/computer_fundamentals/computer_number_system.html
- http://www.electronics-tutorials.ws/logic/logic_3.html



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|----------------------|--------------------------------|---------------------------------|
| PART - IV | Title : DATA STRUCTURES | Subject Code : 17 UITS21 |
| SBS | | |
| Semester : II | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To know the basic definition of data structures and its types
2. To know about the efficiency of linear and non-linear data structures
3. To learn about the concept of Trees.

UNIT-I: Need for data structures – data types – Abstract data types (ADT) -Definition of data structure – types of data structures – Algorithm analysis: – problem solving – categories of problem solving – Problem solving strategies with examples.

UNIT-II: **Stack** :Introduction – ADT stack – Implementation of Stack : Representation using arrays and Linked lists – Applications of stack : Well formedness of parenthesis-Syntax checking using stacks –Infix, Prefix and Postfix forms of expressions – Recursive functions – Tower of Hanoi.

UNIT-III: **Queues** : Introduction – Implementation of Basic operations on Array based – On Linked list based - circular queues - Dequeue. **Linked List** : Introduction - Memory allocation – Benefits and limitations – Types – Basic operations of Singly Linked List – Insertion – Print – Deletion.

UNIT-IV: **Sorting**: Introduction – types – bubble sort – Insertion – shell – Selection – Merge – Quick sort – Heap Sort – Radix sort .

UNIT-V: **Trees** –Introduction - Binary trees – types of binary trees – complete, almost complete and strictly binary trees – skew trees – Representation of Binary trees : Linear Representation- Simple Algorithms on Binary trees - Binary tree traversals – inorder, preorder and postorder traversal

TEXT BOOK(S):

Chitra, Rajan - Data Structures – Vijay Nicole Publishers

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I: Chapter 1: Page no -1-6 Chapter 2: page No - 9-13

Unit II: Chapter 5: Page No. 81 to 104

Unit III: Chapter 6: Page no 111 to 121 Chapter 4 : Page No. 41 to 46 , 49, 54.

Unit IV: Chapter 11: Page No 253 to 287

Unit V: Chapter 7: Page No 125 to 139

REFERENCE BOOKS:

1. Sartaj sahani, “Data Structures and Application in C++” , MC-Graw Hill,2000
2. Weiss, Data structures and algorithm analysis in C++, 3rd edition Pearson education .

Web site Links: (E-learning resources)

- [http:// www.tutorialspoint.com/data_structures_algorithms/data_structures_basics.html](http://www.tutorialspoint.com/data_structures_algorithms/data_structures_basics.html)
- <http://www.studytonight.com/data-structures/introduction-to-data-structures>



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III SEMESTER(2016-17 Batch Only)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 14UACT31/ H31/S31 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 14UACE31 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

III SEMESTER(2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 17UACT31/ H31/S31 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE31 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

III SEMESTER(2016-17 batch and 2017-18 onwards)

| Sl. No | Part | Subject Code | Subject Title | Hrs/ week | Exam hrs | CA | SE | Tot | Crd |
|--------|------------|-----------------------|---|-----------|----------|----|----|-----|-----|
| 3. | III Core | 16UITC31/ 17UITC31 | Relational Database Management System and Sql | 4 | 3 | 25 | 75 | 100 | 4 |
| 4. | III Core | 16UITCP3/ 17UITCP3 | Oracle Lab | 4 | 3 | 40 | 60 | 100 | 3 |
| 5. | III Allied | 16UITA31/ 17UITA31 | Resource Management Techniques | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | IV SBS | 16UITSP1/ 17UITSP1 | Multimedia Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | IV NME | 16UITN31/ 17UITN31 | Foundation of Information Technology | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 22 |

Passed in the BOS Meeting
held on 15-3-2017

Signature of Chairman/HOD



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|-----------------------|--|--|
| PART - III | Title : RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS) | Subject Code : 17 UITC31/ 16 UITC31 |
| CORE | | |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To understand about the concept of Data and Information.
2. To understand about the Relational Data base Management.
3. To learn the PL/SQL programming concepts.

UNIT-I: Introduction to Database Management Systems: (Introduction, Why a Database, Characteristics of Data in a Database, Database Management System, Why DBMS, Types of DBMS) – Introduction to RDBMS (Domain Constraints, Entity Integrity, Reference Integrity, Operational Constraints) – Database Architecture and Data Modeling.

UNIT-II: E-R Modeling:- (Introduction, E-R Model, Components of an E-R Model, E-R Modeling Symbols) – Data Normalization (1NF, 2NF,3NF, Boyce-codd Normal Form(BCNF), 4NF, 5NF, Domain Key Normal Form(DKNF),Demoralization).

UNIT-III: Introduction to SQL- Tables, Views and Indexes:-(Creating a Table, Modifying a table, Deleting a Table) –Insert, update and delete operations (Insert statement, Bulk inserts of Data, Update statement, delete statement).

UNIT-IV: Queries and Sub queries :- (Queries and Sub queries) – Aggregate functions (Introduction, General rules, Count(),Count(*),SUM(),AVG(),MAX() and MIN())-Joins and Unions – Evolution of Computing models.

UNIT-V: Data Integrity – Transaction management and concurrency control (COMMIT, ROLLBACK and SAVEPOINT commands). **Introduction to PL/SQL:-** Introduction, PL/SQL variables, Character Set, PL/SQL sentence structure, Comments, PL/SQL Data Types, Control Structures, Iterative Control statements, PL/SQL Blocks.

TEXT BOOK(S):

1. Alexis Leon and Mathews Leon “Data base Management System” Leon Vikas Publishing Chennai,2002

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- Unit- I Chapter 1: Pg.No: 1- 6,Chapter 5: Pg.No:99-117, Chapter 7:Pg.No:159-165
 Unit-II Chapter 8: Pg.No: 117-186,Chapter 9: Pg.No:195-212,Chapter 11:Pg.No:241-254
 Unit –III Chap 14: Pg.No:296-310,Chapter 15: Pg.No:319-322, Chapter 19:Pg.No:395-398
 Unit-IV Chap 17: Pg.No: 355-378,Chapter 18: Pg.No:385-390,Chapter 21:Pg.No:413-426
 Unit-V Chapter 28: Pg.No: 567-575,Chapter 29: Pg.No:605-606, Chapter 46.D:Pg.No:933-953

REFERENCE BOOKS:

1. Raghu Ramakrishanan & Johannes Gehrke “Database Management Systems” 2nd edition, McGraw Hill international Edition,2003
- 2.C.J.Date, An introduction to Database Systems, Pearson education 8th edition

Web site Links: (E-learning resources)

- <http://www.studytonight.com/dbms/rdbms-concept.php>
<https://www.tutorialspoint.com/sql>



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|-----------------------|-------------------------------|----------------------------------|
| PART - III | Title : ORACLE LAB | Subject Code : 17 UITCP3/ |
| CORE | | 16 UITCP3 |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To Understand the knowledge about Simple, Join Queries
2. To Understand the knowledge about Constraints
3. To Understand the knowledge about PL/SQL programming skills.

SQL Queries:

1. Interfacing with Database systems-SQL-DML Command Querying the Database
2. Creation of Database Using Integrity constraints and Making Queries.
3. Learning Built in Commands and Functions.
4. Conversion functions, miscellaneous functions and groups functions.
5. Processing of sub Queries.

PL/SQL

1. Program using Iterative controls and Sequence Controls.
2. Program using Exception Handling
3. Program using Implicit Cursors and Explicit Cursors.
4. Application development programs like Payroll, EB bill report generation, students Details.
5. Program to join the tables.
6. Programming with Triggers



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|------------------------------|--|--|
| PART - III ALLIED | Title :RESOURCE MANAGEMENT TECHNIQUES | Subject Code : 17 UITA31/ 16 UITA31 |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

To solve many application problems like Traveling salesman problem, Graphical method, Least cost method, Vogel's approximation method, using various techniques.

UNIT-I: Definition of OR - Development of OR – History of OR – Mathematical Modeling - Characteristics & Phases - Tools, Techniques & Methods - Scope of OR – Uses of OR.

UNIT-II: Linear Programming Problem - Formulation of LPP – Managerial Problems in LPP – Different forms of LPP – Matrix Form, Standard Form, Canonical Form, and Slack & Surplus Variables - Graphical Solution: General, No Feasible, Unbounded Problems.

UNIT-III : Solving the Linear Programming Problem with three variables: Simplex Method - Computational Procedure – Artificial Variables Technique – Big M Method with two variables only.

UNIT-IV: Mathematical formulation of Assignment problem - Method for solving the assignment Problem.- Hungarian Algorithm method – Balanced Assignment problem – Unbalanced Assignment problem – Traveling Salesman Problem.

UNIT-V: Mathematical Formulation of Transportation Problem – Balanced Transportation Problem – Unbalanced Transportation Problem – Finding the Initial Basic Feasible Solution – North West Corner Rule, Column Minima Method, Row Minima Method, and Matrix Minima Method - Vogel's Approximation Method, Finding Optimality for Transportation Problem

TEXT BOOK(S):

Resource Management Techniques – Prof.V.Sundaresan,K.S.Ganapathy Subramanian, K.Ganesan A.R.Publications

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- Unit I - Chapter 1(1.1 to 1.7)
- Unit II - Chapter 2(2.1,2.2,2.3,2.5), Chapter 3(3.1 , 3.2)
- Unit III- Chapter 3(3.3, 3.4, 3.2,3.2.1)
- Unit IV- Chapter 8(8.2, 8.3, 8.5, 8.6, 8.7, 8.9)
- Unit V - Chapter 7(7.1 to 7.5)

REFERENCE BOOKS:

1. Arumugam and Issac, Linear Programming Problem, Prentice Hall 2002.
2. Kanti and Swarap, Manmohan, Operation Research, Harvard University Press, 2001.

Web site Links: (E-learning resources)



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|-----------------------|---|--|
| PART - IV | Title : FOUNDATION OF INFORMATION TECHNOLOGY | Subject Code : 17UITN31/ 16UITN31 |
| NME | | |
| Semester : III | HOURS : 2 hours / Week | CREDITS : 2 |

OBJECTIVES:

1. To understand about basic of computer.
2. To understand about the hardware and software.
3. To understand about programming and network

UNIT-I: Introduction of Information

Introduction – Characteristic of Information, Uses of information , Flow of Information , Levels of Information , Categories of Information – Classification of Computers(Analog , Digital , Hybrid , General , Special , Micro , Mini , Mainframe , Laptop, Portable)

UNIT-II: Basic principles of operation of Digital Computer

Input Unit (Magnetic Tape, Disk, Floppy Disk, MICR, OCR, BAR CODE READER, OMR, Keyboard, Mouse, Joystick, Touch screen, Video Display Unit) – CPU – Output unit (Impact Printer and Non-Impact Printer)

UNIT-III: Hardware and Software

Computer System – Hardware – Software (System Software and Application Software) – Generation of Computer (First to Fifth)

UNIT-IV: Data and File

Data processing concepts – Data processing Cycle – Objectives – Steps – Operation – File Organisation (Elements of File , Objective of File ,Sequential,Direct and Indexed File Organisation).

UNIT-V: Programming and Network

Problem solving and Programming – concept of Programming – Programming Tools – Types Network(LAN, WAN,MAN)

TEXT BOOK(S):

Text book of Information Technology- R.Saravana kumar, R.parameshwaran, and T.Jeyalakshmi-S, CHAND and company Ltd.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- Unit-I : Chapter 1: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 3.1
- Unit-II : Chapter 3: 3.2
- Unit-III : Chapter 3: 3.3, 3.5.2
- Unit-IV : Chapter 4: 4.1, 4.2, 4.3, 4.4, 4.5, Chapter 5: 5.2
- Unit-V : Chapter 6: 6.1, 6.2, 6.3, Chapter 7: 7.2.1, 7.2.2, 7.2.3

REFERENCE BOOKS:

1. Introduction to Computers, Peter Norton, sixth edition, Mc-Graw Hill Companies.
2. Fundamental of Computer, V.Rajaraman Fifth edition, Kindle Edition

Web site Links: (E-learning resources)

- https://www.tutorialspoint.com/computer_fundamentals
- <http://ecomputernotes.com/fundamental/input-output-and-memory/list-various-input-and-output-devices>



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|---------------------------------|-------------------------------|--|
| PART - III SBS | Title : MULTIMEDIA LAB | Subject Code : 17UITSP1/ 16UITSP1 |
| Semester : III | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To understand about basic tools usage in photoshop.
2. To understand about basic of usage of multimedia.
3. To understand about the basic techniques usages.

Photoshop:

1. Write the procedure for cloning the image to another image using clone object tool.
2. Write the procedure to change the text to 3d-text in photoshop.
3. Write the procedure for lighting and lens effect photoshop.
4. Write the procedure for merging two picture in photoshop.
5. Write the procedure for rain effect in photoshop.
6. Write the procedure for making photo gallery in photoshop.

Flash:

1. Write the procedure for moving an object in flash.
2. Write the procedure for moving an object. Also use guide layer to move the object in the same area in flash.
3. Write the procedure for morphing an object in flash.
4. Write the procedure for animating a given text in flash
5. Write the procedure for masking a text in flash.



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IV SEMESTER(2016-17 Batch Only)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 14UACT41/ H41/S41 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 14UACE41 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

IV SEMESTER(2017-18 onwards)

| Sl. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|---------|----------------------|---------|------------------------------|-----------|----------|----|----|-----|-----|
| 1 | 17UACT41/ H41/S41 | Part-I | TAMIL/ HINDI/ SANSKRIT | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE41 | Part-II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |

IV SEMESTER(2016-17 batch and 2017-18 onwards)

| Sl. No | Part | Subject Code | Subject Title | Hrs/ week | Exam hrs | CA | SE | Tot | Crd |
|--------|---------------|-----------------------|------------------------------------|-----------|----------|----|----|-----|-----|
| 3. | I | 16UITC41/ 17UITC41 | Visual Basic | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | II | 16UITCP4/ 17UITCP4 | VB and . Net Lab | 5 | 3 | 40 | 60 | 100 | 3 |
| 5. | III Allied | 16UITA41/ 17UITA41 | Numerical Methods | 4 | 3 | 25 | 75 | 100 | 4 |
| 6. | IV SBS | 16UITSP2/ 17UITSP2 | Shell Programming and Linux Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7. | IV NME | 16UITN41/ 17UITN41 | Software Presentation | 2 | 3 | 25 | 75 | 100 | 2 |
| 8 | V | | EXTENSION ACTIVITY | 0 | | | | | 1 |
| | | | Total | 30 | | | | | 23 |

Passed in the BOS Meeting
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Signature of Chairman/HOD



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|----------------------------------|-------------------------------|--|
| PART - III CORE | Title : VISUAL BASIC | Subject Code : 17UITC41/ 16UITC41 |
| Semester : IV | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To understand about objects in VB.
2. To understand about statements in VB.
3. To understand about function and graphics usage in VB

UNIT-I: Starting a new project – The properties of window – Common form properties – Scale properties – Color Properties – Making a form responsive – Printing a visual representation of a form – types – creating standalone windows programs – The toolbox – creating controls – The name(Control name) property – properties of command buttons – simple event procedures for command buttons – access keys – Image controls – Textboxes – labels – Navigating between controls – Message boxes – The Grid – The ASCII representation of forms.

UNIT-II: Statements in Visual Basics – Variables – Setting properties with code – Data types – Working with variables – More on strings – More on numbers – Constants – Input boxes – Displaying information on a form – The format function – Picture boxes – Rich Text Boxes – The Printer Object – Determination loops – indeterminate loops – Making decisions – Select case – Nested If-Then – The GOTO – String functions – Numeric Functions – Date and Time Functions – Financial functions

UNIT-III: Function procedures –sub procedures – Advanced uses of procedures and functions – Using the Object Browser to Navigate among your subprograms – List : One dimensional arrays – Arrays with more than one dimension – Using Lists and Array with functions and procedures – The new array-based string – Records(User-Defined Types)

UNIT-IV: The With statements – Enums – Control arrays – List and Combo boxes – The Flex grid control – Code modules: Global Procedures – The DoEvents Function and Sub Main – Accessing Windows function – Error Trapping – Creating an object in Visual Basic.

UNIT-V: Fundamentals of graphics – Screen scales – The line and shape controls – Graphics via code – Line and Boxes – Circles, Ellipses and Pie Charts. The Mouse event procedures – Dragging and dropping operations – File commands – Sequential files – Random access files – Binary files – Sharing files – File system controls – The file system objects – The Clipboard – Running another windows program from within

TEXT BOOK(S):

Gary Cornell “Visual BASIC 6 from the Ground up” Tata Mcgraw Hill Edition 1999



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CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I: Chapter 3: Page No: 63-94 Chapter 4: Page No: 97-134

Unit II: Chapter 5: Page No: 148-187 Chapter 6: Page No: 193-218 Chapter 7: Page No: 220-253
Chapter 8: Page No: 288-297

Unit III: Chapter 9: Page No: 303-333 Chapter 10: Page No: 338-374

Unit IV: Chapter 10: Page No: 378-379 Chapter 11: Page No: 384-422 Chapter 12: Page No: 438-451

Unit V: Chapter 16: Page No: 592-630 Chapter 17: Page No: 648-662 Chapter 18: Page No: 676-721
Chapter 19: Page No: 726-739 Chapter 20: Page No: 747-752

REFERENCE BOOKS:

1. Paul Sheriff "Visual Basic" PHI -1999
2. Peter Norton's & Michael Groh 1998 "Guide to Visual Basic 6 Techmedia"

Web site Links: (E-learning resources)

<http://ecomputernotes.com/visual-basic>

<http://www.vbtutor.net/>



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|----------------------------|--------------------------------|--|
| PART - III CORE | Title : VB AND .NET LAB | Subject Code : 17UITCP4/ 16UITCP4 |
| Semester : IV | HOURS : 5 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To know about the basic programming concept.
2. To know about the various object used in programming.
3. To know about the Advance programming in .Net

VB Lab

1. Program for Calculating Simple and Compound Interest
2. Program for Listbox Manipulation
3. Program to Designing a Calculator
4. Program for Drive,Dir,FileBox
5. Program moving an Object using Timer Control
6. Program for creating an EDITOR
7. Program for Checking ADAM Numbers
8. Program for Generating Fibonacci Series
9. Program for Checking ARMSTRONG Number
10. Program for String Manipulation

Console Application from .Net

11. Calculating Sales and Commission.
12. Calculation of EB-Bill using Structure
13. Structure using Multiple Records.
14. SORTING Numbers in an given array
15. FUNCTION OVERLOADING using Switch Case

Windows Application from .Net

16. Creation of Class Checking ARMSTRONG & REVERSE a Number.
17. Displaying Directories Using TREEVIEW
1. Dialog Control (Open,Save,Color,Font)
2. Factorial, +ve –ve zero,Sum of series using Status and Progress Bar.
3. Retrieving Record using DATAGRID
4. Displaying Record Using ComboxBox, ListBox and DataGrid.
5. Searching and Retrieving Record.



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|-----------------------------------|----------------------------------|--|
| PART - III ALLED | Title : NUMERICAL METHODS | Subject Code : 17UITA41/ 16UITA41 |
| Semester : IV | HOURS : 4 hours / Week | CREDITS : 4 |

OBJECTIVES:

To solve many application problems like Iteration Method, Newton Raphson Method ,Trapezoidal rule.

UNIT-I: Algebraic & Transcendental Equations : Errors in Numerical Computation – Iteration method – Bisection Method – Regula Falsi method – Newton Raphson method.

UNIT-II: Simultaneous Equations : Gauss Elimination method – Calculation of Inverse of Matrix – Gauss seidel iteration method. Curve fitting Method of Least squares.

UNIT-III: Interpolation: Newton's interpolation formulae – Central Differences interpolation formulae – Lagrange's interpolation formula – Inverse interpolation.

UNIT-IV: Numerical differentiation: Newton's Forward and Backward difference formulae – Numerical Integration: Trapezoidal rule – Simpson's rule. Eigen values and Eigen vectors of a matrix.

UNIT-V: Numerical solution of differential equations: Euler's method – Taylor's series method – Rangekutta methods

TEXT BOOK(S):

S.Arumugam and A Thanagapandi issac ,A.Somasundaram “Numerical Methods sci Tech publication Chennai 2002

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I - Chapter 3(3.0 to 3.5)

Unit II - Chapter 4(4.3, 4.5, 4.8) Chapter 2(2.4)

Unit III - Chapter 7(7.1 to 7.3, 7.6)

Unit IV- Chapter 8(8.1, 8.2, 8.5) Chapter 5(5.0 to 5.2)

Unit V - Chapter 10(10.1 to 10.4)

REFERENCE BOOKS:

1. Mathews J.H.” Numerical Methods for Maths,science and Engineering”PHI new Delhi 2001
2. Numerical Methods T.Veerarajan and T.Ramachandran 2nd edition TataMcGrawHill 2006



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| PART - IV SBS | Title : SHELL PROGRAMMING AND LINUX LAB | Subject Code : 17UITSP2/ 16UITSP2 |
| Semester : IV | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

1. To understand about the commands
 2. To understand the usage of commands in program.
 3. To understand about the basic program in Linux
-
1. Shell Script for calculating Simple Interest
 2. Shell Script for Swapping Two Numbers
 3. Shell Script for Calculating EB-BILL
 4. Shell Script for Checking +ve,-ne,zero numbers
 5. Shell Script for Checking ODD or EVEN number
 6. Shell Script for Generating ARMSTRONG Number
 7. Shell Script for Generating PRIME Numbers
 8. Shell Script for Checking ADAM Number
 9. Shell Script for Generating an Multiplication Table
 10. Shell Script for Generating Fibonacci Series
 11. Shell Script for Finding NATURAL NUMBER,REVERSED,SUM OF DIGITS
 12. Shell Script for Occurrence of a Characters



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| PART - IV NME | Title: SOFTWARE PRESENTATION | Subject Code : 17UITN41/ 16UITN41 |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

OBJECTIVES:

1. To understand about the Fundamentals of computer.
2. To understand about the Office automation
3. To Learn how present the project using office.

UNIT-I: Fundamentals of Computers : Early computers – Modern computer – Computer Hardware – Input devices – Output devices – Storage devices – Types of computer – Computer Software – Communication devices.

UNIT-II: Microsoft Word – Introduction – Menus – Creating a new blank document – Tool bars – Saving the document – Preview – Print – Editing the document – Formatting – setting margins , page numbers – Headers and footers – Tables – Mail merge.

UNIT-III : Microsoft Excel – work environment – Tool bars – Create , Save and closing Excel workbook – Charts – Formulas and functions – Calculate the workbook data – Common Excel Functions – Copying values – Deleting rows and columns – Inserting rows and columns – Automatic filling of entries.

UNIT-IV: Microsoft Access – Creating tables – Defining the primary key – Adding validations to the table – Updating tables.

UNIT-V : Microsoft PowerPoint – Working in Power point – create, save and working with text in slides – Formatting the text - Adding animation to slides.

TEXT BOOK(S):

Comdex computer course kit-Vikas Gupta, Dream Tech publishers,2005

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit- I: Chapter 1:Pg.No.16 to 26, 37 to 44

Unit-II: MS Word : Chapter 1: Pg.No. 186 to 191 Chapter 2: Pg.No. 195 to 206

Chapter 3: Pg.No. 213 to 218 Chapter 4: Full(Pg.No.222 to 243) Chapter 5: Pg.No.248 to 250, 252 to 254,256 to 264 Chapter 6: Full Pg.No.272 to 290

Unit-III: MS Excel: Chapter 1: Pg.No.300,301,305 Chapter 2: Full(Pg.No.314 to 321) Chapter 3: 325 to 330, 340 to 345.

Unit-IV: MS Access: Chapter 2: Full (Pg.No.378 to 391) Chapter 4: Full (Pg.No.394 to 412)

Unit-V: MS Power Point: Chapter 1 & Chapter 2 Full.(Pg.No.450 to 482)



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V SEMESTER

| Sl. No | Part | Subject Code | Subject Title | Hrs/ week | Exam hrs | CA | SE | Tot | Crd |
|--------|--------------|------------------------|---|-----------|----------|----|----|-----|-----|
| 1. | III Core | 16UITC51/ 17UITC51 | Java Programming | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | III Core | 16UITC52/ 17UITC52 | Operating System | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | III Core | 16UITC53/ 17UITC53 | TCP/IP | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | III Core | 16UITCP5/ 17UITCP5 | Java Programming Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 3. | III Core | 16UITCP6/ 17UITCP6 | Internet Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 4. | III Elective | 16UITE51/ 17UITE51* | Principles of Information Security | 5 | 3 | 25 | 75 | 100 | 5 |
| | | 16UITE52/ 17UITE52* | Introduction to Unified Modeling Language | | | | | | |
| | | 16UITE53/ 17UITE53* | Biometrics | | | | | | |
| 6. | SELF STUDY | 16USSS11 | Soft Skills | - | - | - | - | 100 | - |
| | | | Total | 30 | | | | | 25 |

*One elective subjects to be chosen from the three elective subjects.



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|----------------------------|---------------------------------|--|
| PART - III CORE | Title : JAVA PROGRAMMING | Subject Code : 17UITC51/ 16UITC51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To Understand the programming knowledge in Java.
2. To Understand about the concepts of object oriented programming.
3. To Understand about the concepts of Multithread packages and exceptions.

UNIT-I: Fundamentals of OOP JAVA Evolution -features, comparison between C and C++ -Java and Internet -World Wide Web -Web browsers -H/W and S/W requirements -support systems - Java environment -JDK, JVM, API, IDE. Overview of Java Language -Constants -Variables Data types - Tokens -Simple Java Program Structure - Implementing Java program..

UNIT-II: Operators and Expressions: Arithmetic Operators – Relational, logical, assignment, Increment and decrement, conditional, Bit-wise, special operators – Arithmetic expressions, Evaluation of expressions – Type conversions - Operator precedence and associatively- Selection and Iteration– IF – IF... Else -Nested IF else - Switch Operator- While statement -Do -FOR -Jumps in loops- Labeled Loops.

UNIT-III: Classes-Objects -Methods -Defining a class -Adding methods. Variables - creating objects -Accessing class members- Constructors methods overloading -static members’ .Nesting of methods

UNIT-IV: Inheritance -Overriding methods -Final variables and methods -Final classes- Finalize methods -Abstract methods and classes -Visibility control. Packages: System packages -Definition - Using system packages -Naming conventions -creating packages -Accessing a package -Using a package -Adding a class to a package.

UNIT-V: Multithreaded programming : creating threads – Extending thread class – Life cycle of a thread -Using thread methods - Thread Exception- Managing Errors and exceptions :Types of errors - Exceptions –Syntax of Exception handling code – Multiple Catch statements – Using Finally statement – Throwing our own exceptions.

TEXT BOOK(S):

E.Balagurusamy, A Primer Programming with Java, Tata McGraw -Hill Publishing Company Ltd., New Delhi, 2002

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chapter 1(1.1 to 1.5), Chapter 2(2.1 to 2.9), Chapter 3(3.2,3.5,,3.6), Chapter 4(4.2 ,4.3,4.4)

Unit II – Chapter 5(5.2 to 5.14), Chapter 6(6.2 to 6.7), Chapter 7(7.2 to 7.6)

Unit III – Chapter 8(8.1 to 8.10)

Unit IV – Chapter 8(8.11 to 8.18), Chapter 11(11.3 to 11.8)

Unit V – Chapter 12(12.1 to 12.7), Chapter 13(13.1 to 13.7)

REFERENCE BOOKS:

1. Patrick Naughton & Herbert Schmidt, The Complete reference Java 2, 5th Edition, Tata McGraw Hill, 2006.

2. Jon Byous, Java Technology: The Early years, Sun Developer Network, 2005.

Web site Links: (E-learning resources)

www.tutorialspoint.com/java , <http://www.w3schools.in/java-tutorial/>



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|----------------------------|---------------------------------|--|
| PART - III CORE | Title : OPERATING SYSTEM | Subject Code : 17UITC52/ 16UITC52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To Understand about Computer System Structure and Operating System Concepts
2. To Understand about process management, CPU scheduling, Deadlock
3. To Understand about the storage management and File system implementation

UNIT-I: **Introduction:** Definition–SimpleBatch System, Multiprogrammed – TimeSharing – Distributed System – **Computer System Structure** : Hardware Protection (Dual Mode Operation ,I/O Protection , Memory Protection , CPU Protection – **Operating System Structure:** System Components – Operating system services, Systemcalls, System programs.

UNIT-II **Process Management** :Process concepts, scheduling,operations – cooperating processes(Creation and Termination) – Interprocess communication(Message Passing System , Naming, Synchronization , Buffering) – **Threads** : Multithreading models and issues.

UNIT-III: **CPU Scheduling and Deadlock** : Scheduling Basic Concept – Scheduling Criteria – Scheduling Algorithms (FCFS ,SJF,RR) –Multilevel Queue Scheduling - Algorithm Evaluation (Deterministic , Queuing , Simulations) -Deadlock Characterization, Prevention, Avoidance and Detection- Recovery from deadlock

UNIT-III: **CPU Scheduling and Deadlock** : Scheduling Basic Concept – Scheduling Criteria – Scheduling Algorithms (FCFS ,SJF,RR) –Multilevel Queue Scheduling - Algorithm Evaluation (Deterministic , Queuing , Simulations) -Deadlock Characterization, Prevention, Avoidance and Detection- Recovery from deadlock

UNIT-V: **File-System and Disk Scheduling** : File Concepts – Access methods – Allocation method – Directory Structure(Single Level ,Two Level,Tree Structured) – **FileSystem Implementation** : – Allocation Methods (Contiguous Allocation ,Linked Allocation , Indexed Allocation) – Disk Management – Swap Space Management

TEXT BOOK(S):

Sliberschartz A.Galvin P.B. Gange F.,”Operating System Concepts” – 6th Edition 2012, John Wiley and Sons.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I: Chapter 3: Page No: 63-94 , Chapter 4: Page No: 97-134

Unit II: Chapter 5: Page No: 148-187, Chapter 6: Page No: 193-218, Chapter 7: Page No: 220-253, Chapter 8: Page No: 288-297

Unit III: Chapter 9: Page No: 303-333, Chapter 10: Page No: 338-374

Unit IV: Chapter 10: Page No: 378-379, Chap 11: Page No: 384-422, Chapter 12: Page No: 438-451

Unit V: Chapter 16: Page No: 592-630, Chapter 17: Page No: 648-662,Chapter 18: Page No: 676-721,Chapter 19: Page No: 726-739,Chapter 20: Page No: 747-752

REFERENCE BOOKS:

1. MauriceJ.Bach “Design of Unix Operating System” Prentice Hall of India NewDelhi-2002
 Davis Operating System Pearson education 6th edition

Web site Links: (E-learning resources)

<http://www.ics.uci.edu/~ics143/lectures.html>, <http://www.studytonight.com/operating-system>



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|----------------------------|-------------------------------|--|
| PART - III CORE | Title : TCP / IP | Subject Code : 17UITC53/ 16UITC53 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To understand about Basic of Networks
2. To understand about the Classes of IP Address
3. To understand about DNS and DHCP

UNIT-I: Basics of Networks

Definition – Need for Network – Types of Network – Types of Topology – Transmission Media : Coaxial Cables , Twisted Pair Wire , Optic Fibre – Connecting Devices : Repeater , Hub , Switches , NIC – OSI Model : Layered Architecture – OSI Model – Layers in TCP/IP Protocol Suite.

UNIT-II : Network Layer

Switching: Circuit and Packet Switching – Connection Less and Connection Oriented Services – Network Services: Services Provided at Source Computer , Each Router , Destination Computer – Ipv4 Address: Introduction – Classful and Classless addressing.

UNIT-III: TCP

Transport Layer Services : Process to Process ,Addressing , Encapsulation and Decapsulation,Multiplexing and Demultiplexing ,Flowcontrol,Connection and Connection less Protocols –Simple, Stop&Wait , Go-Back N - TCP Services – TCP Connection : Error Control, Checksum, Acknowledgement, Retransmission. Client Server Paradigm : Client, Server ,Concurrency, Socket Interface.

UNIT-IV: DHCP and DNS

Introduction – DHCP Operation – Configuration- DNS: Need for DNS – Namespace – DNS in the Internet- DNS Msg – Types of Record.

UNIT-V: FTP and WWW

FTP : Connections ,Communication, Command processing, File Transfer – WWW Architecture : Hypertext and Hypermedia, Web client, Web server, Uniform Resources Locator (URL) – Web Documents: Static Documents, Dynamic Documents, Active Documents- Electronic mail : Architecture , UserAgent , SMTP Commands & Responses , Mail Transfer Phases.

TEXT BOOK(S):

TCP/IP Protocol Suite 4th Edition – Behrouz A.Forouzan TATA McGrawHill Edition.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- Unit I: Page 20 – 30 Unit II : Page 95 – 107 , 115 – 142
 Unit III : Page 375-379,386,390,391,395,465,466,543-546
 Unit IV: Page 569 – 579, 582-592, 598,599
 Unit V: Page 630 -639, 657-659,660-663,681-686,687-691.

REFERENCE BOOKS:

1. Andrew S. Tanenbaum, “Computer Networks”, 4th Edition, Pearson Education,
2. E.Douglas Comer, David L. Stevens, “Internetworking with TCP/IP - Volume I II and III

Web site Links: (E-learning resources)

- <http://www.studytonight.com/computer-networks>
<http://www.techiwarehouse.com/engine/d9e99072/Basic-Networking-Tutorial>



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|----------------------------|---|--|
| PART - III CORE | Title : JAVA PROGRAMMING LAB | Subject Code : 17UITCP5/ 16UITCP5 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To improve the creativity during problem solving.
2. To understand the concepts of Java.
3. To develop programming skills in java.
 1. Program using Switch-Case statement to perform the following operations.
 - (i) Sum of natural numbers.
 - (ii) Factorial of a given number.
 - (iii) Display the cubes of numbers between 1 to 100.
 2. Program to print the mark list of a student.
 3. Program print the numbers in ascending order.
 4. Program for Constructor Overloading
 5. Program for Method Overloading.
 6. Program to implement Dynamic Method Dispatch.
 7. Program for User Defined Exception.
 8. Program to implement Multithreading.
 9. Program to print the academic and sports marks of a student using interface.
 10. Program for Employee Net Pay Calculation using Parameter attribute.
 11. Program to print the Employee details using Button, Label and Text Field.
 12. Program to implement simple arithmetic operations using Frame Application.



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| PART - III CORE | Title : INTERNET LAB | Subject Code : 17UITCP6/ 16UITCP6 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To Develop Basic of Web Designing.
2. Easy to learn JQuery.
3. To Simply Javascript Programming

1. Program to Test if jquery is loaded.
2. Program to Scroll to the top of the page with jquery.
3. Program to Disable right click menu in html page using jquery.
4. Program to Disable/enable the form submit button.
5. Program to Blink text using jquery.
6. Program to Create a Zebra stripes table effect.
7. Program to Print a page using jquery.
8. Program to Limit character input in the text area including count.
9. Program to Finds all checkbox inputs.
10. Program to Hide all the input elements within a form.
11. Program to Mark first word bold of all elements.
12. Program to Create a div using jquery with style tag.
13. Program to Add a list of elements within an unordered list element.
14. Program to Getting the value of a textbox using jquery.
15. Program to Left and right mouse click with jquery.



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| PART - III CORE | Title:PRINCIPLES OF INFORMATION SECURITY | Subject Code : 17UITE51/ 16UITE51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

1. To understand about the basic of security
2. To understand about various Threats.
3. To understand about Security Technologies.

UNIT-I: Information Security:

History of Information Security – What is Security – Components of Information System - Security System Development Life Cycle – Security Professionals and the Organization – Communities of Interest – Information Security Is it an Art or Science.

UNIT-II Why Security is Needed :

Business Needs First – **Threats:** Deliberate Software Attacks : Virus, Worms, Trojan Horses – Deviations in Quality of Services – Forces of Natures – Human Error or Failure – Thefts – Technical Hardware Failure or Errors – Technical Software Failure or Errors. **Attacks:** Malicious Code , Hoaxes , Backdoors , Password Check , Denial of Service , Spoofing , Spam , Mail bombing , Timing Attack.

UNIT-III: Managing IT Risk:

Overview of Risk Management – **Risk Identification** : Plan and Organize the Process , Asset Identification and Inventory , Information Asset Valuation – **Risk Control Strategies:** Defend , Transfer , Mitigate , Accept , Terminate – **Selecting Risk Control Strategy:** Feasibility Studies , Cost Benefit Analysis (CBA), Evaluation, Assessment and Maintenance of Risk Control.

UNIT-IV: Plan for Security:

Information Security , Planning and Governance – Information Security Policy , Standards and Practices : Definition, EISP , ISSP – **Security Education , Training and Awareness Program – Continuity Strategies :** Business Impact Analysis , Incident Response Planning. **Security Technology : Access Control** – Identification, Authentication , Authorization , Accountability.

UNIT-V: Security Technology : Firewalls – Firewall Processing Modes , Firewall Categorized by Generation , Firewall Categorized by Structure , Remote Access , VPN

Scanning And Analysis Tools : Port Scanner , Firewall Analysis Tools , Operating System Detection Tools , Vulnerability Scanners , Packet Sniffers - Biometric Access Tools.

TEXT BOOK(S):

Principles of Information Security – Michael E. Whitman and Herbert J. Mattord 4th Edition

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit I: Chapter 1: Page No. 3-11, 16-19, 26-32

Unit II: Chapter 2 : Page No. 39-48, 54-57, 61-62, 63-68, 72 (Timing attack only)

Unit III: Chapter 4: Page No. 117-132, 144-153

Unit IV: Chapter 5: Page No. 168-178, 203-221 Chapter 6: Page No. 238-242

Unit v: Chapter 6: Page No. 242-255, 270-277 Chapter 7: Page No. 318-326, 331-333

REFERENCE BOOKS:

Computer Security Art and Science, Matt Bishop, Pearson/PHI, 2002



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| PART - III CORE | Title : INTRODUCTION TO UNIFIED MODELING LANGUAGE | Subject Code : 17UITE52/ 16UITE52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

1. To Understand about the basis of UML.
2. To Understand about the Pattern approach
3. To Understand about Modeling methodologies

UNIT I: Object Oriented Methodologies: Introduction – Survey of some of the Object oriented methodologies – Rumbaugh et al’s Object modeling technique – The booch methodology – The Jacobean et al. methodologies – patterns – frameworks – the Unified approach.

UNIT-II

Unified Modeling language – Introduction – Static and Dynamic models – why modeling – Introduction to the Unified modeling language – UMS diagrams – UML class diagram – user-case diagram – UML dynamic modeling – model management – UML extensibility – UML meta model.

UNIT-III:

Object oriented analysis process – introduction – Why analysis is a difficult activity – Business object analysis – use-case driven object oriented analysis – business process modeling – use-case model – developing effective documentation – case study.

UNIT-IV:

Object analysis: classification – classification theory – approaches for identifying classes – noun phrases approach – common class patterns approach – use-class driven approach – classes, responsibilities and collaborators – naming classes.

UNIT-V:

Identifying object relationships, attributes and methods – associations – super-sub class relationships – A part of relationships aggregation – case study – class responsibility – defining attributes for ViaNet Bank objects – Object responsibility – Defining methods for Vianet Bank objects.

TEXT BOOK(S):

Object oriented systems development using Unified Modeling Language – Ali Bahrami – TMH edition, 2008

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- UNIT I: Chapter 4
- UNIT II: Chapter 5
- UNIT III: Chapter 6
- UNIT IV: Chapter 7
- UNIT V: Chapter 8

REFERENCE BOOKS:

Object oriented analysis and design using UML – Mahesh P Matha – PHI, 2008



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| PART - III CORE | Title : BIOMETRICS | Subject Code : 17UITE53/ 16UITE53 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

1. Knowledge about Finger Prints
2. Knowledge about Facial recognition Technology
3. Knowledge about Retina Scanning

UNIT-I:

How Authentication technologies work : What you Know-Passwords and PINs– Cards and Tokens – What you are: Biometrics – Multi-Factor authentication – Subverting the system – Deploying Authentication systems – Economics of Authentication -How **Biometrics work :** Brief History of Biometrics – Why Use Biometrics – Key Elements of Biometric System.

UNIT-II

Fingerprint and Hand Geometry: – History of Fingerprints – Hand Geometry - **Facial and Voice recognition:** Facial recognition application – Facial recognition Technology – Voice Verification

UNIT-III:

Eye Biometrics:Iris and retina Scanning: – Iris recognition technology – Applications – Retina Scanning – Accuracy. **Signature Recognition and Keystroke Dynamics:** Signature Recognition – Keystroke Dynamics

UNIT-IV:

Esoteric Biometrics – Vein pattern – Facial Thermography – DNA- Sweat pores – Hand Grip – Fingernail Bed – Body Odor – Ear – Gait- Skin Luminescence – Brain Wave Pattern – Footprint and Foot Dynamics – The Future.

UNIT-V:

Biometrics in large Scale Systems- Getting Started- Documenting the procurement process – specifying the systems – Same AFIS RFP Overview. **Biometric Testing and Evaluation:** -Who tests and Who Benefits- The three bears principle- Best practices for Biometrics testing – Types of Testing – Certification.

Text Book:

Biometrics – The Ultimate References, John D.Woodward, Jr.Nicholas M.Orlans , Peter T.Higgins – Dreamteach Publishers 2003

REFERENCE BOOKS:

Guide to Biometric Reference Systems and Performance Evaluation
 Petrovska – Delacretaz , Dijana,chollet, Gerard,Dorizzi,Bernadette

Web site Links: (E-learning resources)

<http://www.biometric-solutions.com/fingerprint-recognition.html>



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VI SEMESTER

| Sl. No | Part | Subject Code | Subject Title | Hrs/ week | Exam hrs | C A | SE | Tot | Cr d |
|--------|--------------|------------------------|-------------------------------|-----------|----------|-----|----|-----|------|
| 1. | III Core | 16UITC61/ 17UITC61 | Software Engineering | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | III Core | 16UITC62/ 17UITC62 | Web Designing with PHP | 5 | 3 | 25 | 75 | 100 | 4 |
| | III Core | 16UITC63/ 17UITC63 | Mobile Computing | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | III Core | 16UITCP7/ 17UITCP7 | Web Design & PHP Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 4. | III Elective | 16UITE61/ 17UITE61* | Management Information System | 5 | 3 | 25 | 75 | 100 | 5 |
| | | 16UITE62/ 17UITE62* | Software Testing | | | | | | |
| | | 16UITE63/ 17UITE63* | E-Commerce | | | | | | |
| 5. | III Elective | 16UITEV1/ 17UITEV1 | Project and Viva Voce | 5 | 3 | 25 | 75 | 100 | 5 |
| 6. | SELF STUDY | 16UGKC11 | General Knowledge | - | - | - | - | 100 | - |
| | | | Total | 30 | | | | | 26 |

* One elective subject to be chosen from the three elective subjects.



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|----------------------------|---|--|
| PART - III CORE | Title : SOFTWARE ENGINEERING | Subject Code : 17UITC61/ 16UITC61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To understand the concepts of Software Engineering.
2. To understand the concepts of Cost estimation.
3. To understand the concepts of Verification and Validation Techniques.

UNIT-I:

Introduction to Software Engineering Some definitions - Quality and productivity factors - Managerial issue. Planning a software project: Definition the problem - Developing a solution strategy- planning the development process - planning an organization structure - other planning activities.

UNIT-II Software Cost Estimation:

Software - Cost factors - software cost estimation techniques - Specification techniques – staffing -level estimation - estimating software maintenance costs.

UNIT-III: Software requirements definition:

The software requirements specification - format languages and processors for requirements specification.

UNIT-IV: Software Design:

Fundamentals Design concepts - Modules and modularizing Criteria Design Notations – Design Techniques - Detailed Design Consideration - Test plan - Mile stones walk through and inspection - Design guide lines.

UNIT-V: Verification and validation Techniques:

Quality Assurance - static analysis - symbolic exception - Unit testing and Debugging – System Testing - formal verification. Software maintenance: Enhancing maintainability during development – managerial aspects of software maintenance.

TEXT BOOK(S):

Richard E.Fairly, "Software Engineering Concepts", McGraw Hill Book Company.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- Unit I - Chapter 1 (1.1, 1.3, 1.4) , Chapter 2(2.1 to 2.5)
- Unit II - Chapter 3(3.1 to 3.4)
- Unit III - Chapter 4(4.1 to 4.3)
- Unit IV - Chapter 5(5.1 to 5.5, 5.7 to 5.9)
- Unit V - Chapter 8(8.1 to 8.7)

REFERENCE BOOKS:

Roger S.Pressman, "Software Engineering : A practitioner's approach" McGraw Hill International Book Company.

Web site Links: (E-learning resources)

www.tutorialspoint.com/software_engineering/

www.computernotes.com/software-engineering



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|----------------------------|--|--|
| PART - III CORE | Title: WEB DESIGNING WITH PHP | Subject Code : 17UITC62/ 16UITC62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To enable the students to understand the importance Scripting Language.
2. To become familiar with HTML .
3. To become familiar with PHP

UNIT-I: HTML

Introduction to HTML – Tags – Commonly used HTML commands : Structure of an HTML Program , Titles and Footer , Text Formatting , Emphasizing Materials in a Web Page – Text Styles – Types of Lists – Adding Graphics to HTML Documents – Tables – Hyperlink – Frames.

UNIT-II Basics of PHP

Basics of PHP: Data types – Variables – scope of variables – constants – here documents – Operators: Unary Operator, Binary Operator and Ternary Operator – Arrays – conditional statements: if statements, else if clause, switch statement.

UNIT-III: Iterations: for loop, while loop, do while loop, for each loop, infinite loop, loops within loop – Functions: User-defined Functions: Functions with arguments – multiple arguments – Accept and return Value by reference – By value.

UNIT-IV: PHP server variables: Functions for variables – Controlling script functions – Array functions – Working with Date and Time – Performing mathematical operations – Working with string functions: Finding a string – Return first occurrence – Replacing – Converting to and from ASCII – measuring string – Trimming and wrapping - changing string case.

UNIT-V: Working with FORMS

Form Elements: Textbox , Text Area , Password , Radio button , Checkbox , Combo box , hidden field , Image , SUBMIT and Reset Buttons – Adding Elements to a Form: Textbox , Text Area , Password Field , Radio Button , Select box , Checkbox – Error Handling in PHP.

TEXT BOOK(S):

HTML, Javascript, DHTML and PHP – Ivan BayRoss 4th Edition BPB Publications
 CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I – Chapter 2(Pg.No.19 to 25), Chapter 3(Pg.No.33 , 34), Chapter 4(Pg.No.38 to 41), Chapter 5(Pg.No.47 to 52), Chapter 6(Pg.No.58 to 63), Chapter 7(Pg.No.74 to 75)

Unit II – Chapter 17(Pg.No.278 to 315)

Unit III – Chapter 17(Pg.No.319 to 330, 332) Chapter 18(Pg.No.339 to 346)

Unit IV – Chapter 18(Pg.No.356 to 397)

Unit V – Chapter 19(Pg.No.410 to 427) Chapter 21(Pg.No.481 to 505)

REFERENCE BOOKS:

Web Programming unleashed – Bob BreedLove,et al

Web site Links: (E-learning resources)

<http://www.w3schools.com/html>

<http://www.javatpoint.com/php-tutorial>

<https://www.tutorialspoint.com/php/>



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604

| | | |
|----------------------------|--------------------------------|--|
| PART - III CORE | Title: MOBILE COMPUTING | Subject Code : 17UITC63/ 16UITC63 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To understand the Basic Mobile Computing
2. To understand the GPRS
3. To understand the WAP

UNIT-I: Introduction - Mobility of Bits and Bytes - Wireless the beginning - Mobile computing - Mobile Computing Architecture - Three tier architecture - Design consideration for mobile computing.

UNIT-II Evolution of Telephony - Mobile computing through telephone - Emerging Technologies - Introduction - Bluetooth - Radio Frequency Identification

UNIT-III: GPRS - Introduction and Packet Data Network - GPRS Network Architecture - Operations - Data services in GPRS

UNIT-IV:

Wireless Application Protocol - Introduction - WAP - MMS - GPRS application – CDMA

UNIT-V:

Wireless LAN : Introduction - wireless LAN Advantages - Wireless LAN security - Wifi Versus 3G

TEXT BOOK(S):

Mobile Computing Technology applications and Service creation Asoke K Talukder, Roopa R. Yavagal TMH publishing company Newdelhi 2005

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit I: Chapter 1: 1.1-1.3 Chapter 2: 2.4-2.6

Unit II: Chapter 3: 3.1-3.4 Chapter 4: 4.1-4.3

Unit III: Chapter 7: 7.1-7.5

Unit IV: Chapter 8: 8.1-8.4 Chapter 9: 9.1-9.2, 9.4-9.5

Unit V: Chapter 10: 10.1-10.2, 10.4, 10.8, 10.12

REFERENCE BOOKS:

Mobile Computing – Rajkamal Published by Oxford Higher Education/Oxford University Press, 2011



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605

| | | |
|----------------------------------|--|--|
| PART - III CORE | Title: WEB DESIGN & PHP LAB | Subject Code : 17UITCP7/ 16UITCP7 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

1. To Understand about the Tags.
2. To Understand about Web Page Creation
3. To Understand programming in PHP

HTML :

1. Design student ID card using image tag.
2. Display various Subjects using Lists.
3. Design class Timetable using Tables.
4. Display various Text styles and Colors using Frames.
5. Design Student Admission Form.

PHP:

6. Arithmetic operations.
7. If, Else, Else-If statements.
8. For each statement and is function statements.
9. Continue Break statements.
10. Arrays.
11. String functions.
12. Personal information using Post method.
13. Bus Ticket Reservation using Post method.
14. Employee Details using Get method.
15. Student Details using Get method.
16. Calendar function.
17. Multiplication Table.
18. Inheritance.
19. Validation.
20. Session.



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606

| | | |
|--------------------------------|---|--|
| PART - III ELECTIVE | Title: MANAGEMENT INFORMATION SYSTEM | Subject Code : 17UITE61/ 16UITE61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

1. To Understand about the concept of Management, Information and System
2. To Understand about E-Commerce and E-Governance.
3. To Understand about IS Security and Threats.

UNIT-I: Introduction of MIS

Need for MIS – Concepts : Management, Information, Systems – Definition – Structure of MIS – Types of MIS: Hierarchical , Functional , Enterprise ,General Support Information System.

UNIT-II Information, System Concepts

Introduction – Definition – Type of Information – Information Quality - Dimension of Information – System: Definition – Kinds of System – System Related Concept – Element of a System.

UNIT-III: Ecommerce, Ebusiness, EGovernance

Introduction – E-Commerce – Ecommerce Sales Life Cycle – Ecommerce Infrastructure - Ecommerce Application , Payment system – EBusiness – EGovernance: Objectives, Delivery Models.

UNIT-IV: IS Planning and IS Development

Introduction: Information System Planning – Creating an IS Plan – Resource Allocation - Introduction: System Development Life Cycle – System Development Models.

UNIT-V: Information Requirement analysis & Design , IS Security

Introduction – System Analysis – Requirement Determination – Strategies of Requirement Determination – Structured Analysis Tools - System Design - Introduction: IS Security Threats.

TEXT BOOK(S):

Management Information System 4th Edition D.P.Goyal

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I : Page : 3-47

Unit II : Page: 67 – 78

Unit III : Page 239 – 250

Unit IV : Page 319 – 332, 367 – 377

Unit V : Page 389 – 400 , 475,476

REFERENCE BOOKS:

1. Jawadekar, W. S. (2004). Management Information Systems. Tata McGraw Hill.
2. Management Information System – Dr. S. P. Rajagopalan

Web site Links: (E-learning resources)

<http://ecomputernotes.com/mis/structure-and-classification/explain-mis-classification>



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607

| | | |
|--------------------------------|--------------------------------|--|
| PART - III ELECTIVE | Title: SOFTWARE TESTING | Subject Code : 17UITE62/ 16UITE62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

1. To understand Basic Testing Concepts
2. To understand Various Testing
3. To understand the Execution and Reporting

UNIT-I: Software Development Life Cycle models:

Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. **White-Box Testing:** Static Testing – Structural Testing –Challenges in White-Box Testing

UNIT-II : Black-Box Testing:

What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - **Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash.

UNIT-III: System and Acceptance Testing:

System Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing – Nonfunctional Testing – Acceptance Testing – Summary of Testing Phases

UNIT-IV: : Performance Testing:

Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT-V: Test Planning, Management, Execution and Reporting:

Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics
TEXT BOOK(S):

SOFTWARE TESTING Principles and Practices – Srinivasan Desikan & Gopalswamy Ramesh, 2006, Pearson Education

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

UNIT-I: 2.1-2.5, 3.1-3.4

UNIT-II: 4.1-4.4, 5.1-5.5

UNIT III: 6.1-6.7

UNIT IV: 7.1-7.6, 8.1-8.5

UNIT-V: 15.1-15.6, 17.4-17.7

REFERENCE BOOKS:

1. **EFFECTIVE METHODS OF SOFTWARE TESTING**–William E.Perry, 3rd ed,Wiley India.
2. **SOFTWARE TESTING** – Renu Rajani, Pradeep Oak, 2007, TMH

Web site Links: (E-learning resources)

www.tutorialpoint.com

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|--------------------------------|-------------------------------|--|
| PART - III ELECTIVE | Title: E-COMMERCE | Subject Code : 17UITE63/ 16UITE63 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

OBJECTIVES:

1. This subject deals with E-commerce concepts like E-Commerce, MCommerce, E-Security and E-payment.
2. Knowledge on E-commerce and Real World and Cyberspace problem awareness.
3. To inculcate knowledge on E-Commerce concepts in the present IT world.

UNIT-I:

What is e-commerce? – E-Commerce is not E-Business – the drivers – Myths You should know – Advantages and Issues in E-Commerce – Benefits and Limitations of the Internet– Role of E-Strategy – Integrating E-commerce – E-Commerce Business Models – Management Implications.

UNIT-II Mobile-Commerce-The Business of Time:

What is M-Commerce? – Why wireless? – How wireless Technology is employed? – Wireless LAN – Wireless application Protocol -Implications for Management.

UNIT-III: Business-to-Business E-Commerce:

What is B2B E-Commerce? – Supply chain Management and B2B – B2B Models – B2B Tools-EDI.

UNIT-IV: E-Security

Security in Cyberspace – Designing for Security – How much risk you afford? – The VIRUS – Security Protection and Recovery – Role of Biometrics - How to secure your system? – Security and Terrorism

UNIT-V: Getting the money: Real World Cash – Electronic Money – Requirements for Internet-Based Payments – How would you like to pay? – B2B and E-Payment – M-Commerce and M-Payment – General Guide to E-Payment.

TEXT BOOK(S):

ELECTRONIC COMMERCE from Vision to Fulfillment – Elias M. Awad, 3rd edition, PHI. (Chapters: 1, 6, 11, 13 &15)
 CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

REFERENCE BOOKS:

1. E-COMMERCE Strategy, Technologies and Applications – David Whiteley, 2001, TMH.
2. INTRODUCTION TO E-COMMERCE – Jeffrey F. Rayport, Bernard J. Jaworski, TMH.

Web site Links: (E-learning resources)

https://www.tutorialspoint.com/e_commerce/e_commerce_security.html.



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| | | |
|--------------------------------|---|--|
| PART - III ELECTIVE | Title: PROJECT AND VIVA VOCE | Subject Code : 17UITEV1/ 16UITEV1 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

1. A Maximum of two students can join to do the project work.
2. Students must undertake the project work under the guidance of a faculty member
3. Progressive reports have to be submitted to the guide periodically
4. The internal test marks is 40 and is divided into the following components
 - (i) Two Presentations – 2 x 10 = 20 Marks
 - (ii) Progressive Reports - 10 Marks
 - (iii) Internal Viva-voce - 10 Marks
5. The external examination will be jointly conducted by both the Internal and External Examiners
6. The Student must submit 3 copies (2 copies for students + 1 copy for the Dept.) of their project Report two week before the external examination.
7. The maximum marks for the external examinations is 60 and it may be divided into the following components
 - (i) Project Report - 20 marks
 - (ii) Project Presentation - 20 marks
 - (iii) Project viva-voce - 20 marks



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I SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hours/Week | Exam Hrs | CA | SE | Tot | Crd |
|-------|--------------|--------------------|--|------------|----------|----|----|-----|-----|
| 1. | 17UACT11 | Part-I | Tamil | 6 | 3 | 25 | 75 | 100 | 3 |
| | 17UACH11 | | Hindi | | | | | | |
| | 17UACS11 | | Sanskrit | | | | | | |
| 2 | 1UAC E11 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UMBC11 | Part-III Core | General Microbiology | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UMBS11 | Part-IV SBS | Diagnostic Microbiology And Haematology | 3 | 3 | 25 | 75 | 100 | 3 |
| 5 | 17UCYA11 | Part-III Allied | General Chemistry-I | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | | Part-III Core | *Core Practical- I | 2 | - | - | - | - | - |
| 7 | | Part-III Allied | *Allied Practical- I Chemistry | 2 | - | - | - | - | - |
| 8 | 14UACVE1 | Part-IV | Value Education | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 19 |

***Core Practical - I and Allied lab - I – Practical exams at the end of the II semester**

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| | | |
|----------------------------|---|---------------------------------|
| PART - III CORE | Title : GENERAL MICROBIOLOGY | Subject Code : 17 UMBC11 |
| Semester : I | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To introduce the basic concepts in Microbiology with an exposure to various microorganisms at the elementary level.

UNIT I: Introduction – Definition , scope and history of Microbiology –Theory of Abiogenesis- Contributions of Leeuwenhoek, Louis Pasteur, Robert Koch, Edward Jenner , Joseph lister , Elie Metchnikoff , Paul Ehrlich, Alexander Fleming ,Waksman , Beijerinck, Twort,d'Herelle , James Watson and Francis crick.

UNIT II: Microscopy –Parts and function of a Microscope – Terms –Magnification Power ,Numerical aperture , Resolving power –Types of Microscopes, Simple, Compound ,Light and Dark field Microscope, Phase Contrast Microscope, Fluorescent Microscope, Electron Microscope-Scanning and Transmission –Functions and application.

UNIT III: Prokaryotes - Ultra structure and function- Cellular Organization of Bacteria - Structure and functions of cell wall, Cytoplasmic membrane, S-Layer, Capsule, Pili, Flagella , Nucleoid, Ribosome, Plasmid, mesosomes, Endospore, cytoplasmic inclusions. Differences between prokaryotes and eukaryotes.

UNIT IV: Salient features of Bacteria – *E. coli*, *Bacillus*, *Clostridium* and *Blue Green Algae*, *Actinomycetes*, *Streptomyces* – Salient features, Structure and reproduction- *Yeast*, *Aspergillus* and *Penicillium* as examples.

UNIT V: Salient features of Algae – Structure and reproduction of *Chlorella*, *Chlamydomonas* and *Diatoms* – Salient features of Viruses – HIV, TMV. Bacteriophage- T4 (structure only).

TEXT BOOK(S):

1. Pelczar, M.J., Chan, E.C.S and Kreig, N.R. 1995. Microbiology, 5th Ed, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
2. Schlegel, H. G. 1993. General Microbiology, 7th Ed., Tata McGraw Hill Publications.
3. Sullia, S.B and Santharam, S. 2000. General Microbiology, Oxford and IBH Publishing Co., Pvt., Ltd.

REFERENCE BOOKS:

1. Prescott, Harley and Klein, 2006, Microbiology, 6th Ed., Tata McGraw Hills.
2. Alexopoulos C. J and Mims C. W. 2000 Introductory Mycology, 3rd Ed., Wiley Eastern Publications.
3. Dimmock, N. J., Easton, A.J and Leppard, K. N. 2001.Introduction to Modern Virology, 5th Ed., Blackwell Publications.

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| | | |
|----------------------------------|--|-------------------------------------|
| PART - IV SKILL BASED | Title : DIAGNOSTIC MICROBIOLOGY AND HAEMATOLOGY | Subject Code : 17 UMBS11 |
| Semester : I | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES:

To train the students in the fields of Basic Clinical and Diagnostic Microbiology.

UNIT I: Role of Microbiology Lab; Safety regulations -Types, Collection and handling of Specimens, Preparations of Serum and Plasma. – Laboratory Identification of Infectious agents. Staining Techniques - Simple, Gram's and Acid-Fast.

UNIT II: Components of Blood and their functions-Erythrocytes, Leukocytes, Lymphocytes, Monocytes and Thrombocytes. Anti-Coagulants-Blood Collecting containers with anti coagulants. Blood collections by Vein puncture and Capillary Puncture.

UNIT III: Routine Hematological tests – Determinations of Hemoglobin content, RBC, WBC, and Platelet counts. Study of Stained Blood Smear – Differential count. Reticulocyte count – ESR- Eosinophil count.

UNIT IV: Clinical Pathology –Urine analysis and Stool Examinations- Routine Procedure in Blood Bank- ABO Blood grouping and Rh typing – Compatibility testing or Cross – matching.

UNIT V: Microbial analysis of different types of Clinical specimens –Blood, Pus and Throat Swab. Antimicrobial Susceptibility tests, Minimal Inhibitory Concentration (MIC) of Antibiotics (Definition only).

TEXT BOOK(S):

1. Mukherjee, K.L. Medical Laboratory Technology Vol –I, III, Tata McGraw-Hill publishing company LTD., New Delhi.
2. Ananthanarayanan, R and Jayaram Panicker, C.K. 2005. Text book of Microbiology, Orient Longman.



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II SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hrs/Week | Exam Hrs | CA | SE | Tot | Crd |
|-------|--------------|-----------------|---------------------------------|----------|----------|----|----|-----|-----|
| 1 | 17UAC T21 | Part-I | Tamil | 6 | 3 | 25 | 75 | 100 | 3 |
| | 17UACH21 | | Hindi | | | | | | |
| | 17UACS21 | | Sanskrit | | | | | | |
| 2 | 17UAC E21 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17 UMB C21 | Part-III Core | Microbial Physiology & Taxonomy | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 UMB S21 | Part-IV SBS | Cosmetic Microbiology | 3 | 3 | 25 | 75 | 100 | 3 |
| 5 | 17 UCY A21 | Part-III Allied | General Chemistry-II | 4 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17 UMBCP1 | Part-III Core | *Core Practical- I | 2 | 3 | 40 | 60 | 100 | 2 |
| 7 | 17 UCY AP1 | Part-III Allied | *Allied Practical-I Chemistry | 2 | 3 | 40 | 60 | 100 | 2 |
| 8 | 14 UAS ES1 | Part-IV | EVS | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 23 |

***Core Practical - I and Allied lab - I – Practical exams at the end of the II semester**

Passed in the BOS Meeting
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Signature of Chairman/HOD



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| | | |
|----------------------------|--|---------------------------------|
| PART - III CORE | Title : MICROBIAL PHYSIOLOGY AND TAXONOMY | Subject Code : 17 UMBC21 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 4 |

OBJECTIVES:

To inculcate the concepts of anabolism and catabolism with an elaborate coverage on the Classification System of Microorganisms.

UNIT I: Bioenergetics- Laws of thermodynamics. Generation of energy, Generation of ATP, Substrate Level Phosphorylation, Oxidative Phosphorylation, ETC – Respiration – Aerobic and Anaerobic mechanisms.

UNIT II: Photosynthesis and Inorganic Metabolism- Photosynthesis in bacteria – Structural aspects of Electron Transport in Green bacteria - Cyanobacteria and Purple Photosynthetic bacteria. Inorganic metabolism in bacteria – Nitrogen, Phosphorous and Sulfur.

UNIT III: Bacterial Cell division and Differentiation – Events of Sporulation in *Bacillus* – Endospore formation, activation, germination and outgrowth. Differentiation in *Caulobacter*, *Dictyostelium*.

UNIT IV: Taxonomy – Major characteristics used in Taxonomy – Morphological, Physiological, biochemical and Molecular characteristics and their role. Principles of Chemotaxonomy and Numerical taxonomy.

UNIT V: Classification of fungi by Alexopoulos and Mims, Fritsch classification of Algae, Baltimore classification of Viruses. Major families with suitable examples.

TEXT BOOK(S):

Albert G. Moat John W. Foster and Michael P. Spector, 2003, Microbial Physiology, 4th Ed., Library of Congress Cataloguing In Publications.

REFERENCE BOOKS:

1. Daniel R. Caldwell, 1995. Microbial Physiology and Metabolism, Library of Congress Cataloguing In Publications.
2. Alexopoulos C. J and Mims C. W. 2000 Introductory Mycology, 3rd Ed., Wiley Eastern Publications.



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| | | |
|----------------------------------|--|----------------------------------|
| PART - IV SKILL BASED | Title : COSMETIC MICROBIOLOGY | Subject Code : 17 UMB S21 |
| Semester : II | HOURS : 3 hours / Week | CREDITS : 3 |

OBJECTIVES: To enlighten the students in the applications of Microbiology in Cosmetics.

UNIT I: History of Cosmetic Microbiology – Need for cosmetic microbiology, Scope of cosmetic microbiology, - Role of microbes in cosmetics preparation.

UNIT II: Quality control measures in cosmetics preparation – Microbial resistance – Critical Control point

UNIT III: Microorganisms in cosmetics – Preservation of cosmetics – Mechanisms of action of Cosmetic preservatives – Enzymes in cosmetics.

UNIT IV: Validation of Method – Equipment Cleansing and Sanitization – Validation in Microbiology Laboratory – Media, microbial Content Test, Identification, Sterilizers, Decontamination.

UNIT V- Antimicrobial properties of natural cosmetic products – Garlic, Neem, Turmeric, Aloe vera and Tulsi.

TEXT BOOK(S):

Philip, A.G. 2006. Cosmetic Microbiology. A Practical approach. 2nd Ed., Taylor & Francis group.

Daniel K. Brannan. 1997, Cosmetic Microbiology: A practical handbook, CRC Press.

Online References:

www.pharmatutor.com



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| | | |
|----------------------------|-----------------------------------|----------------------------------|
| PART - III CORE | Title : CORE PRACTICAL – I | Subject Code : 17 UMB CP1 |
| Semester : II | HOURS : 2 hours / Week | CREDITS : 2 |

OBJECTIVES: To train the students in the Practical basics of Microbiology.

Basic Microbiology:

1. Preparation of media and media components.
2. Sterilization Methods: Physical and Chemical methods.
3. Isolation and enumeration of bacteria and fungi from environmental samples.
4. Measurement of Cell size by Micrometry.
5. Pure culture techniques – Streak, Spread and Pour Plate Methods.
6. Observation of bacterial motility by Hanging drop Method.
7. Staining Techniques – Simple Staining, Gram's Staining, Negative Staining – Capsule Staining, Fungal Staining and Endospore Staining.

Microbial Taxonomy:

A. Observation of Permanent Specimen:

- Bacteria : *E. coli, Bacillus, Clostridium*
Algae : Chlorella, Euglena, Chlamydomonas, Diatoms.
Fungi : *Rhizopus, Mucor, Aspergillus, Penicillium* and Yeast.
Viruses : T₄, Lambda, HIV and TMV.

B. Biochemical tests for bacterial identification:

1. Carbohydrate fermentation and acid- gas production.
2. IMViC tests.
3. Catalase test.
4. Oxidase test.
5. TSI.
6. Starch, Lipid and protein hydrolysis.

Microbial Physiology:

Measurement of Cell growth by Direct Count and Viable Count.

Reference Books:

1. Practical Microbiology by P. Gunasekaran.
2. Practical Microbiology by Kannan.
3. Microbiology by Cappuccino.
4. Practical Microbiology by Aneja.



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III SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hours/Week | Exam Hrs | CA | SE | Tot | Crd |
|-------|--------------|--------------------|-------------------------------------|------------|----------|----|----|-----|-----------|
| 1 | 17UAC T31 | Part-I | Tamil | 6 | 3 | 25 | 75 | 100 | 3 |
| | 17UACH31 | | Hindi | | | | | | |
| | 17UACS31 | | Sanskrit | | | | | | |
| 2. | 17 UAC E31 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3. | 17UMBC31 | Part-III Core | Molecular Biology | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17UMBA31 | Part-III Allied | Allied II– Cell Biology | 4 | 3 | 25 | 75 | 100 | 4 |
| 5. | 17 UMBS31 | Part-III SBS | Mushroom Technology | 3 | 3 | 25 | 75 | 100 | 3 |
| 6. | 17UMBN31 | Part-IV NME | Food & Dairy Microbiology | 2 | 3 | 25 | 75 | 100 | 2 |
| 7 | | Part-III Core | *Core Practical - II | 2 | - | - | - | - | - |
| 8. | | Part-III Allied | *Allied Practical II- Biology | 2 | - | - | - | - | - |
| | | | Total | 30 | | | | | 19 |

*Core Practical - II and Allied lab - II – Practical exams at the end of the IV semester

Passed in the BOS Meeting
held on 15-3-2017

Signature of Chairman/HOD



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|----------------------------|--------------------------------------|----------------------------------|
| PART - III CORE | Title : MOLECULAR BIOLOGY | Subject Code : 17 UMB C31 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To train the students in the basic concepts of Molecular Biology and its importance.

Unit I:

Structural aspects of DNA – the double helical model- Different forms of DNA- A, B, Z & rare forms of DNA -melting curve- Structure of RNA- mRNA, tRNA, rRNA.

Unit-II

DNA replication – modes of DNA replication – Enzymology of DNA replication – Replication in prokaryotes – DNA polymerase in prokaryotes – Replication in eukaryotes- Bidirectional method.

Unit III:

Transcription – RNA polymerase – RNA Processing in Prokaryotes and Eukaryotes – their functions, Process of transcription in prokaryotes - Initiation, Elongation and Termination

Unit IV:

Genetic code –properties – wobble hypothesis-Translation – Stages in Prokaryotic and Eukaryotic translation-Initiation, Elongation and Termination.

Unit V:

Transposable Elements – IS Elements – Transposons – Tn10, Tn5, Tn3 – Operon Concept – Lac & Trp operons

Text Books:

1. Turner, P. C., McLennan, A. G., Bates, A. D and White, M. R. H. 1998. Instant Notes in Molecular Biology, Viva Books Pvt. Ltd.,
2. David Freifelder. 2006. Essentials of Molecular Biology, 4th Ed. Narosa Publishing House,

Reference Books:

1. Twyman, R. M. 1999. Advanced Molecular Biology. 1st Ed., Viva Books Pvt Ltd.,
2. Harvey Lodish, Arnold Berk, Lawrence Zipursky S., Paul Matsudaira, David Baltimore and James Darnell. 2000. Molecular Cell Biology, 4th Ed., W. H. Freeman & Co.
3. David Freifelder. 1993. Essentials of Molecular Biology, 2nd Ed., Panima Publishing Co.



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|------------------------------|-------------------------------|----------------------------------|
| PART - III ALLIED | Title : CELL BIOLOGY | Subject Code : 17 UMB A31 |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives: To expose the students to eukaryotic cell structures, their functions with an introduction to Applied Microbiology.

Unit I:

Cell Structure – prokaryotic and eukaryotic (comparison)-plant and animal cells – structural features. Plasma membrane – Chemistry and ultra-structure – Fluid Mosaic model-functions. Protoplasm – Chemistry and organization – microtubules and microfilaments.

Unit II

Membrane systems in eukaryotes: Endoplasmic reticulum and Golgi complex – structure, chemistry, origin and functions. Organelles in Eukaryotes: Lysosomes – ultra structure and functions, types. Ribosomes – ultra structure and functions.

Unit III:

Chloroplast – ultra structure and chemistry, function – mechanism of photosynthesis and generation of ATP to be explained briefly. Mitochondria – ultra structure and functions – semi autonomy of cell organelles. Nucleus – Nuclear envelop –nucleolus-structure and function. chromosomes –structure-euchromatin & heterochromatin-nucleosomes.

Unit IV:

Cell Cycle – G1, S & G2 phases, Cell division: Mitosis and Meiosis – stages and their significance.

Unit V:

Microscopy-light and electron microscopy-principle and onstruction-resolving power.Centrifugation-principle-Sub cellular fractionations, differential and density centrifugation. Cytochemical staining methods: Lipids (Sudan Black), Polysaccharides – (Periodic Acid Schiff’s reagent), DNA (Feulgen), Nucleic acids – (Methyl Green Pyronin).

Text Books:

1. Verma, P.S. and Agarwal, V.K. 1995. Cell Biology, Genetics and Evolution, S Chand & Co., New Delhi.

References:

1. Albert, B., Bray, D., Lewis, J., Raff, M., Roberts K and Watson. J.D. 1983. Molecular Biology of Cell. Garland Publishing Co., Inc., New York, USA.
2. De Robertis, E.D.P and De Robertis, E.M.F.1990. Cell and Molecular Biology 3rd Ed, McGraw – Hill Publications.
3. Cooper. 1997. The Cell-A Molecular Approach. ASM.



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| PART - IV Skill Based | Title : MUSHROOM TECHNOLOGY | Subject Code : 17 UMB S31 |
| Semester : III | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives: To educate the students the basic concepts in Mushroom Cultivation and their economics.

UNIT: 1

History and Classification of mushroom .Nutritive value of mushrooms – Components of mushroom.

UNIT: 2

Morphology, life cycle of mushroom- Isolation methods and maintenance of mushroom cultures - Spawn production.

UNIT: 3

Methods of mushroom cultivation – Cultivation of white button mushroom, oyster mushroom , shittake and wood ear mushroom.

UNIT: 4

Mushroom recipes –Medicinal value of mushrooms – Mushroom diseases – Bacteria, fungi, Insect and Pests (with one example each) – Control measures.

UNIT: 5

Mushroom Research Stations in India – Economics of mushroom production – Environmental impact.

Reference Books:

1. Sivakumar, N., Kumaresan, V and Satheesh, S .2009. Principles of Mushroom Cultivation .1st Ed., Chandra Publications.
2. Cultivation of Edible Mushroom –ICAR Publications.



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| | | |
|--------------------------------|--|----------------------------------|
| PART - IV NME | Title : FOOD AND DAIRY MICROBIOLOGY | Subject Code : 17 UMB N31 |
| Semester : III | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives: To inculcate the importance of various microorganisms in the spoilage of food and their implications on human health.

UNIT: I

Importance of Food and Dairy Microbiology – Food as substrate for microbial growth - intrinsic and extrinsic factors affecting growth and survival of microorganism in foods .

UNIT: II

Features of food spoilage like, vegetables, milk and milk products – Milk sterilization techniques. Phosphatase test

UNIT: III

Microbial Spoilage of bread and cereals and meat.

UNIT: IV

Food preservation physical (any 3) and chemical methods (any 3).

UNIT: V

Food borne infection-*Salmonella*, *Shigella*. food borne intoxications-Botulism, Mycotoxin. Detection of food-borne pathogens.

Text Books:

1. Adams, M.R and Moss, M.O. 2000. Food Microbiology. 2nd Ed., New age International Pvt, Ltd publication
2. Frazier, W.C and Westhoff D.C. 2003. Food Microbiology, 4th edition, McGraw Hill, New York

References:

1. Jay, J. M. 2000. Modern Food Microbiology, Aspen Publishers.
2. Robinson. R.K.1990. Dairy Microbiology, Elsevier Applied Science, London.



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IV SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | CA | SE | Tot | Crd |
|-------|--------------|-----------------|--------------------------------|-----------|----------|----|----|-----|-----------|
| 1. | 17 UAC T41 | Part-I | Tamil | 6 | 3 | 25 | 75 | 100 | 3 |
| | 17UACH41 | | Hindi | | | | | | |
| | 17UACS41 | | Sanskrit | | | | | | |
| 2. | 17 UAC E41 | Part-II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3. | 17UMBC41 | Part-III Core | Microbial Genetics | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17UMBA41 | Part-III Allied | Biodiversity and Biostatistics | 4 | 3 | 25 | 75 | 100 | 4 |
| 5. | 17UMBS41 | Part-III SBS | Biocontrol | 3 | 3 | 25 | 75 | 100 | 3 |
| 6. | 17UMBN41 | Part-IV NME | Diagnostic Microbiology | 2 | 3 | 25 | 75 | 100 | 2 |
| 7. | 17UMBCP2 | Part-III Core | *CorePracticals– II | 2 | 3 | 40 | 60 | 100 | 2 |
| 8. | 17UMB AP2 | Part-III Allied | *Allied Practical II -Biology | 2 | 3 | 40 | 60 | 100 | 2 |
| 9. | | PART-V | Extension Activity | - | - | 25 | | | 1 |
| | | | Total | 30 | | | | | 24 |

***Core Practical - II and Allied lab - II – Practical exams at the end of the IV semester**

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Signature of Chairman/HOD



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|----------------------------|---------------------------------------|----------------------------------|
| PART - III CORE | Title : MICROBIAL GENETICS | Subject Code : 17 UMB C41 |
| Semester : IV | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To enlighten the students by educating the basic concepts in Genetics at Microbial level.

UNIT: I

Genetics –Bacterial Genetics –History-Experimental Evidences – DNA as genetic material – concept of gene.

UNIT: II

Mutation –Phenotypes in bacteria-Inheritance experiments- Types of mutation-Mutagens – Physical (UV) and chemical (NTG and Hydroxylamine) – mode of action – Isolation of auxotroph and drug resistance mutants – fluctuation & complementation test

UNIT: III

Methods of Genetic exchange in bacteria – Transformation-Natural –Discovery-Competence- Methods of uptake of DNA-Natural-Induced-Calcium ion induction-Electroporation- Role of transformation in gene mapping

UNIT: IV

Plasmid-Properties -types-F,R,Col-Gene transfer -Conjugation.-F⁺ X F⁻, HFR X F⁻, F'X-F⁻ -Role of conjugation in gene mapping

UNIT: V

Phage genetics- Lytic-Lysogenic cycle (brief account)-Gene transfer-Transduction-Methods -Generalized- specialized– Role in genetic mapping (Brief account)

TEXT

BOOKS:

1. David Freifelder. 1998. Microbial Genetics.Narosa Publishing House.
2. Gardner, E.J., Michael, J., Simmons, D. Snustad, P. 2001. Principles of Genetics 8th Ed , John wiley & sons, Inc.,

REFERENCES:

1. Stanley R. Maloy, John E.Cronan, Jr. David Freifelder. 1994. Text Book of Microbial Genetics 2nd Ed., Narosa Publishing house.
2. Robert F. Weaver and Philip W. Hedrick.1992. Text Book of Genetics 2nd Ed., Wm. C. Brown Publishers.



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|------------------------------|---|----------------------------------|
| PART - III ALLIED | Title : BIODIVERSITY AND BIOSTATISTICS | Subject Code : 17 UMB A41 |
| Semester : IV | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives: To make the students appreciate the importance of Biodiversity in Biological Science along with the basic concepts in Biostatistics.

Unit I : Biodiversity – Introduction, Concept and Scope of Biodiversity. Levels of Biodiversity – Genetic, species & Ecosystem diversity. Megadiverse Centres & Hotspots of Biodiversity(a brief account).

Unit II: Threats to Biodiversity –causes &consequences- IUCN categories of threat. Conservation of Biodiversity – Methods of conservation - *in situ* conservation - National parks, Sanctuaries, Biosphere Reserves, Sacred Groves and *ex situ* conservation - Cryopreservation and Germplasm conservation.

Unit III: Biostatistics: Introduction – definition – Collection of Data – primary & secondary data-explanation and comparison. Methods of collecting primary data. Sampling design- random and non-random.

Unit IV: Classification of data-objectives-types. Tabulation of data-objectives-components of a table- Representation of Data- Diagrammatic (simple bar diagram and pie diagram) & graphic (Histogram, frequency polygon frequency curve, cumulative frequency curve) representation.

Unit V: Measures of Central Tendency- Explanation- types of averages- 1. Arithmetic mean. 2. Median. 3. Mode (problems related to individual, discrete and continuous series). Measures of Dispersion- Explanation and definition – Types. 1. Range. 2. Mean deviation. 3. Standard deviation and variance(problems related to individual and discrete series). Correlation: Explanation – types – methods of studying correlation using Karl Pearson's coefficient of correlation (simple problems related to correlation).

TEXT BOOKS:

1. CPR Manual of Biodiversity. 2003. Environmental Education Centre, Chennai.
2. Krishnamurthy, K.V.2003. An Advanced book on Biodiversity - Principles and Practice, Oxford SIBH publishing Co. Pvt. Ltd., New Delhi.
3. Palanichamy, S and Manoharan.1990. Statistical Methods for Biologists. Palani Paramount Publications.

REFERENCES

1. Belsare, D.K. 2007. Introduction to Biodiversity, APH Publishing Corporation, New Delhi.
2. Gupta, S. 1995. Elementary Statistical Methods 11th Ed., Sultan chand and sons Educational Publishers, New Delhi.

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Signature of Chairman/HOD



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| PART - IV SKILL BASED | Title : BIO CONTROL | Subject Code : 17 UMB S41 |
| Semester : IV | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives: To educate the students to make them appreciate the advantages of Biocontrol and its applications.

UNIT I: Outline of Pest Management Programme – insect pest management and rodent pest management – need of biocontrol agents. Advantages of biocontrol over chemical pesticides.

UNIT II: Biology and ecology of organisms for Biocontrol – predators and Parasitoids - Nematodes.

UNIT III: Biopesticides – bacteria & fungi used as biopesticides, *Bacillus thuringensis*, *B.sphaericus*, *Metarizyium Verticillium* and *Trichoderma* – potentials and limitations.

UNIT IV: Virus as biopesticides – Nuclear Polyhedro virus, Granulosis virus (GV) and CPV, potentials and limitations.

UNIT V: Biological control of weeds – Production, Methods of application – Mycoherbicides – *Phytophthora palmivora* – Plant extracts – Neem, Tobacco, and Pudina.

TEXT BOOKS:

1. Roy G. Van Driesche and Bellows Jr. TS. 1996. Biological Control – Guide to its applications, Springer.
2. Kumerasan. V. Boptechnology, Saras publications.

ONLINE REFERENCES:

[www. Epa.govt.nz](http://www.Epa.govt.nz)

REFERENCES:

1. Helmut Fritz Van Embden. 2004. Pest and vector Control, Cambridge University Press.
2. Atlas, R and Bartha, R. 1987. Microbial ecology, 2nd ED., Benjami Cummings Publications.



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|----------------------|-------------------------------|---------------------------------|
| PART - IV | Title : DIAGNOSTIC | Subject Code : 17 UMBN41 |
| NME | MICROBIOLOGY | |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives: To introduce the students to the basic principles in the field of Medical Microbiology.

UNIT: I

Role of Microbiology Lab; safety regulations. Types, collection and handling of specimens. Preparation of serum and plasma.

UNIT: II

Laboratory identification of infectious agents. Staining techniques; simple, Gram, acid-fast, spore staining.

UNIT: III

Microbiological analysis of different types of clinical specimens: Urine, Blood, Stool, Pus and Throat swab.

UNIT IV: Routine Procedures in Blood Bank – ABO Blood Grouping and Rh typing.

UNIT V: Diagnosis of Mycotic and Parasitic infection. Determination of minimal inhibitory concentration (MIC) of antibiotics. Antimicrobial susceptibility test.

REFERENCES:

1. Mukerjee, K.L., Medical Laboratory Technology Vol. I-III. Tata McGraw – Hill Publishing company ltd., New Delhi.



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|----------------------|-------------------------------|----------------------------------|
| PART - III | Title : CORE | Subject Code : 17 UMB CP2 |
| CORE | PRACTICAL - II | |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives: To train the students in the field of Genetics.

Major Practicals – II

1. Mutagenesis of *E. coli* using UV and chemical mutagen.
2. Isolation of spontaneous mutants – Gradient plate technique.
3. Isolation of auxotrophic and drug-resistant mutants
4. Induction of *Lac Operon*.
5. Transformation – Selection of blue / white colonies.
6. Isolation of bacteriophage.
7. Isolation and Separation of chromosomal DNA by AGE.

References:

1. Janarthanan, S and Vincent S. 2007. Practical Biotechnology Methods & Protocols, University Press
2. Palanivelu, P. 2004. Analytical Biochemistry and Separation Techniques, 3rd Ed., Twenty first Century Publications, Palkalainagar, Madurai.
3. Jeffrey H. Miller. 1992. A Short Course in Bacterial Genetics, Cold Spring Harbour Laboratory Press.



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|------------------------------|--|----------------------------------|
| PART - III ALLIED | Title : ALLIED PRACTICAL II - BIOLOGY | Subject Code : 17 UMB AP2 |
| Semester : IV | HOURS : 2 hours / Week | CREDITS : 2 |

Objectives: To educate the students by hands-on training in applied Biology.

LAB IN ALLIED BIOLOGY - Cell Biology, Biodiversity and Biostatistics

1. Study of Parts and functions of compound microscope
2. Study of Cell inclusions: Starch grains – smear of potato, banana or rice, Cystolith– Sections of *Ficus* leaves,
3. Study of cell organelles by photomicrographs
4. Study of various stages of mitosis and meiosis using *Allium cepa* roots and *Rheo* flower buds
5. By using world and Indian map mark important Biodiversity Regions.
6. Measuring Biodiversity – Species diversity index (Simpson's Index) of vegetation.
7. Analysis of the vegetation for frequency, density and abundance using quadrat method.
8. Collection of endemic plants and animals photos with information by using websites, journals, newspapers etc.
9. Problems in measures of Central tendency- Mean, Median and Mode
10. Problems in measures of Dispersion- Standard Deviation & Variance.

References

1. Arumugam, N. 2010. Cell and Molecular Biology, Saras Publications
2. Agarwal, V.K. 2000. Cell Biology, S. Chand & Co., New Delhi.
3. Krishnamurthy, K.V. 2003. An Advanced book on Biodiversity - Principles and Practice, Oxford SIBH publishing Co. Pvt. Ltd., New Delhi.
4. Belsare, D. K. 2007. Introduction to Biodiversity. APH Publishing Corporation, New Delhi.
5. Gupta, S. 1995. Elementary Statistical Methods 11th Ed., Sultan chand and sons educational publishers, New Delhi.
6. Palanichamy, S and Manoharan. 1990. Statistical Methods for Biologists. Palani Paramount Publications.



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V SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hrs / Week | Exam Hrs | CA | SE | Tot | Crd |
|--------------|--------------|--------------------|---|------------|----------|----|----|-----|-----------|
| 1 | 17UMBC51 | Part-III Core | Clinical Microbiology | 5 | 3 | 25 | 75 | 100 | 5 |
| 2 | 17UMBC52 | Part-III Core | Agricultural and Environmental Microbiology | 5 | 3 | 25 | 75 | 100 | 5 |
| 3 | 17UMBC53 | Part-III Core | Immunotechnology | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UMBC54 | Part-III Core | Food and Industrial Microbiology | 5 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17UMBE51 | Part-III *Elective | Computer Applications in Biology | 5 | 3 | 25 | 75 | 100 | 5 |
| 6 | 17UMBE52 | Part-III *Elective | Bioremediation | 5 | 3 | 25 | 75 | 100 | 5 |
| 7 | 17UMBCP3 | Part-III Core | Core Practical-III | 5 | 3 | 40 | 60 | 100 | 4 |
| 8 | 16USS S51 | | Soft Skills | - | - | - | - | 100 | - |
| Total | | | | 30 | | | | | 27 |

***One paper has to be chosen out of two elective papers**



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|----------------------------|--|----------------------------------|
| PART - III CORE | Title : CLINICAL MICROBIOLOGY | Subject Code : 17 UMB C51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To inculcate clinical microbiology knowledge among students.

Unit: I

History of Infectious diseases -Koch's postulates. Human-microbe Interactions, Virulence factors – Adhesins, Aggresins, Invasins and Impedins, Host defence mechanisms.

Unit: II

Bacteriology: Transmission, Diagnosis, Clinical symptoms, Control, Treatment and Prophylaxes of bacterial member's - *Staphylococcus*, *Streptococcus*, *E. coli*, *Salmonella*, *Bacillus*, *Vibrio* & *Mycobacteria*.

Unit: III

Virology: Etiology, Prophylaxis, Clinical symptoms and Treatment for Human Viral Diseases: SARS, Rabies, Hepatitis & AIDS, Viruses and Cancer.

Unit:IV

Mycology & Protozoan diseases: Classification of Mycoses with example– Superficial, Cutaneous, Systemic & Opportunistic types and Subtypes – Life cycle of Candidiosis. Life cycle, Diagnosis and Treatment of Protozoan diseases – Amoebiasis & Malaria.

Unit: V

Anti microbial chemotherapy – Antibacterial – Penicillin, Streptomycin, Antifungal - Nystatin and Antiviral drugs – Azidothymidine, Modes of action with examples – Drug resistance – MDR, XDR, XXDR and TDR, Mechanisms of Drug Resistance – Enzymatic, Chemical, MDR Pumps, Metabolic Bypass and R-Plasmids.

Text Books:

1. Murray, Rosenthal and Pfaller, Medical Microbiology, 7th Ed., Elsevier Publications.
2. Kenneth J. Ryan and George Ray C., Sherris Medical Microbiology, 4th Ed., McGraw Hill Publications.

References:

1. Paniker, C. K. J. Ananthanarayanan and Paniker's Textbook of Microbiology, 7th Ed., Orient Longman Publications.



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| PART - III CORE | Title : AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY | Subject Code : 17 UMB C52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To expose the students to the concepts of Agricultural and Environmental Microbiology.

Unit I:

Soil Microbes – Bacteria, Fungi and Actinomycetes (Distribution), Microbial Interaction – Mutualism, Amensalism and Commensalism – Soil enzymes – N₂ fixation – Symbiotic and free living. Rhizosphere and phyllosphere – Mycorrhizal Associations – Ecto and Endomycorrhizae – Actinorhyzae.

Unit II:

Plant-Microbe Interactions – Pathogenesis, Mechanisms of Pathogen Establishment and Symptoms. Plant Diseases caused by Bacteria – Xanthomonas & Mycoplasma, Fungi – Pyricularia and Fusarium and Viruses – TMV & CMV, Disease Control – Chemical Fungicides and Pesticides, Disadvantages.

Unit III:

PGPR – *Pseudomonas fluorescence* and Siderophores and HCN. Biofertilizers – Bacterial (*Rhizobium*) & Fungal (VAM) - Production and Methods of Application – Biopesticides – Bacterial (*Bacillus thuringiensis*), Fungal (*Beauveria bassiana*) and Viral (NPV) – Microbial Nematicides and Microbial Herbicides – Biotechnology in Agriculture - Bt Cotton and herbicide tolerant plants.

Unit IV:

Role of Microorganisms in Biogeochemical cycles N₂-cycle, P-cycle and C-cycle, Aquatic Microbiology - Microbes in fresh water & Marine water.

Unit V:

Biodegradation of Xenobiotics (Chlorinated Pesticides) – MEOR – Bioleaching of Metals (Copper and Gold). Bioremediation-Microbes in Waste treatment - Solid waste (Sanitary land fill and Composting) and liquid waste – Sewage treatment – BOD, Pollution indicating microbes.

Text Books:

1. Prescott, Harley and Klein. 2006. Microbiology. 6th Ed., McGraw Hill companies.
2. Subba Rao, N.S. 2002, Soil Microbiology, 4th Ed., Oxford & IBH publication.
3. Sathyanarayana, U. 2008. Biotechnology, 2nd Ed., Arunabha Sen Books and allied Publications Ltd.

References:

1. Rangasami, G and Bagyaraj, D.J. 1993. Agricultural Microbiology, Prentice –Hall Publications.
2. Atlas, R and Bartha, R. 1987. Microbial ecology, 2nd Ed., Benjamin Cummings Publications.



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|----------------------------|---------------------------------|----------------------------------|
| PART - III CORE | Title : IMMUNOTECHNOLOGY | Subject Code : 17 UMB C53 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To enlighten the students with the concepts in Immunology.

Unit: I

Elements of Immunity: Overview of the Immune system – Basic concepts in immunology - (History), Principles of innate and acquired immunity – Cells and organs of the Immune System –Antigens and their Characteristics.

Unit: II

Antibody –Structure, Classification and Characterization, Antigen-Antibody reactions- Agglutination, Precipitation and Flocculation. Immuno-electrophoresis-Complement system, Immune tolerance.

Unit III:

Humoral and Cell Mediated Immune response – B-Cell Maturation - Activation and Differentiation, Major Histocompatibility Complex (MHC)- Antigen Processing and presentation and T-cell Maturation, Activation and Differentiation.

Unit IV:

Hypersensitivity Reactions – Autoimmunity - Autoimmune Diseases, T cell, B cell, Phagocytic and NK cell associated diseases. Vaccines and types with example.

Unit v:

Transplantation Immunology – Autograft, Allograft, Isograft and Xenograft, Basics of Graft Rejection, Tissue typing, Clinical Transplantation of Kidney and Bone Marrow. Tumor antigen, Immune response to tumor, Cancer immune therapy.

Text Books:

1. Travers, J. 1997. Immunobiology, The immune system in health and disease, 3rd Ed., Garland publishers, NY.
2. Klasus, E and Elegert. 1996. Immunology Understanding the immune system. Wiley Liss, NY.
3. Abbas , A.K, Lichtman, A. H and Pober, J.S. 1997. Cellular and Molecular Immunology. 3rd Ed., W.B.Saunders company.

References:

1. Roitt, I.M. 1998. Essentials of Immunology, 8th Ed., Blackwell scientific Publication.
2. Kuby, 2000. Immunology, 4th Ed., W.H.Freeman and company, NY.



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| | | |
|----------------------------|---|---------------------------------|
| PART - III CORE | Title : FOOD AND INDUSTRIAL MICROBIOLOGY | Subject Code : 17 UMBC54 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To educate the students, the concepts in Food Microbiology and Industrial Microbiology and to make them appreciate their importance in life.

Unit I: Importance of Food Microbiology – Intrinsic and Extrinsic Factors affecting microbial growth in food, Features of Food Spoilage in Vegetables, Cereals and Milk.

Unit II: Food Preservation Techniques – Asepsis, Low temperature, High temperature and Irradiation – Radicidation, Radappertization and Radurization, Chemicals, Food Borne Infections – Botulism, Food borne intoxications – Mycotoxicosis, Fermented foods – Sauerkraut – Short account.

Unit III: Fermentor – Basic design and parts –types – Air lift, CSTR, tower and packed bed bioreactors. Upstream process – inoculum preparation – buildup production – Fermentation types – batch, fed batch and continuous.

Unit IV: Production process – Antibiotic (Penicillin) Amino acids (Glutamic Acid) Vitamin(Vitamin B12), Solvent (Ethanol).Detection and Assay of Fermentation products (Biological Assay).

Unit V: Bio Safety levels, Guidelines and Regulations. Quality Assurance and Quality Control of Fermented Products-HACCP.

Text Books:

1. William C. Frazier, Dennis C. Westhoff. 1997. Text Book Of Food Microbiology 4th Ed., Tata McGraw-Hill companies, New York.
2. James M. Jay. 1996. Text Book of Modern Food Microbiology 4th Ed., Champman & Hall, Inc., New York.

References:

1. Patel A. H. 1996. Text Book of Industrial Microbiology, Macmillan Publisher India.
2. Crueger, W. and Cruger, A. 2000. Biotechnology- A Text Book of Industrial Microbiology, Panima Publishers, New Delhi.



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|--------------------------------|---|----------------------------------|
| PART - III ELECTIVE | Title : COMPUTER APPLICATIONS IN BIOLOGY | Subject Code : 17 UMB E51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To introduce the students to the concept of Computers and their applications in Microbiology.

Unit: I Computers – History – Development of computers – Generation of computers – Types of computers – Desktops, Laptops, Notebooks, Netbooks & Tablets – Recent advancements - Data representation – Bit, Nibble, Byte, Kb, Mb, Gb, Tb and Pb, Binary number system.

Unit: II Software, Package and hardware - Computer languages –Development of languages – BASIC, COBOL, JAVA, - Definition and applications only. Computer Program – Definition and Program Execution.

Unit: III Structural components of computer and their uses, Role of Computers in Biological research – Internet & Email, Reference collection.

Unit: IV Phylogenetic analysis – Steps in Phylogenetic analysis – Phylogenetic Tree Construction Methodologies – Distance Matrix and Character Based Methods – Types – Definition Only - Structural Prediction – Softwares for Biomolecular Structure Prediction – MFOLD, Vienna RNA Package – Methods of Protein Structure Prediction - Chou-Fasman Method, GOR Method, Neural Networks and PhD – Brief descriptions only, Digital Biostatistical analysis - Basic, Intermediate and Advance level Biostatistical Packages - examples.

Unit: V Genomics on the world wide web – NCBI, Sequence analysis – Introduction, Sequence Alignment – Pairwise and Multiple Alignments, Global Vs. Local Alignments, Sequence Comparison – Database Search - BLAST and Types -BLAST N,BLAST P and WU-BLAST – PSI –BLAST-Brief descriptions only.

Text Books:

1. Peter Norton .Introduction to Computers, 6th Ed., Tata McGraw Hill Publications.
2. Ignacimuthu .S. 2005.Basic Bioinformatics, Narosa Publishing house Pvt,Ltd.
3. Attwood.T.K and Parry Smith.D.J.1999.Introduction to Bioinformatics, Pearson Education Asia.

References:

1. Rajadurai M., Bioinformatics – A Practical Manual, PSB Book Enterprises.
2. Martin J. Bishop, Genetics Databases, 2nd Ed. Academic Press Publications.



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|--------------------------------------|-------------------------------|----------------------------------|
| PART - III Elective | Title : BIOREMEDIATION | Subject Code : 17 UMB E52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

To provide a deeper insight of the concepts in Bioremediation technology for the students.

Unit 1: Pollutions-Types of pollutants,water (fresh water and marine water) and soil-Sources of pollution and their impact on environment.

Unit 2: Bioremediation- Definition, applications-advantages-Techniques-Biodegradation-Biotransformation-Brief description only.

Unit 3: Environmental Pollution and environmental contamination-Recalcitrant Compounds and Pollutants – Brief Classification of Contaminants – Carbon contents and densities – Effect of contaminants on Environment.

Unit 4: Bioremediation of Contaminants – (a) Organic wastes – Nature and decomposition – Mineralization and Immobilization – Microbes involved – Anaerobic decomposition of organic matter (b) Waste Water – Environmental Impact – Treatment – Primary, Secondary and Tertiary (c) Industrial Waste Water – Types and Components, Effects, Conventional Strategies for waste-water management – Microbes in waste water treatment.

Unit 5: Treatment and disposal of waste waters – Domestic sewage – Primary, Secondary and Tertiary treatment – Microbes for waste water treatment.

References:

1. Atlas, R and Bartha, R. 2003. Microbial ecology. 2nd Ed., Pearson Education Publications.
2. Rajendran, P and Gunasekaran, P. 2006. Microbial Bioremediation, MIP publications.



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|----------------------------------|-------------------------------------|----------------------------------|
| PART - III CORE | Title : CORE PRACTICAL - III | Subject Code : 17 UMB CP3 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To provide practical training to the students in the fields of Medical Microbiology, Immunology, Soil and Agricultural Microbiology.

Medical Microbiology

1. Antibiotic susceptibility test: Kirby Bauer Disc Diffusion method
2. Isolation of pathogenic bacteria from clinical specimens: *Staphylococcus*, *Streptococcus*, *Salmonella*, *Vibrio*

Soil and Agricultural Microbiology

3. Isolation and enumeration of soil microbes .
4. Identification of bacterial pathogen in paddy and vegetable crops(field study)
5. Isolation of nitrogen fixing bacteria-*Rhizobium*,*Azotobacter*
6. Isolation of phosphate solubilizing bacteria- *Pseudomonas*
7. Examination of mycorrhizae-VAM
8. Potability testing of water(MPN test)

Immunology

9. Lymphoid organs in experimental animals-mouse/rat/rabbit – Theoretical explanation only.
10. Bleeding techniques – Capillary puncture and Vein puncture.
11. Separation of serum/plasma
12. Erythrocyte Sedimentation Rate
13. Blood cell count: RBC count, WBC count-total and differential
14. Blood typing: ABO, Rh
15. Agglutination tests: Widal test
16. Precipitation: Ouchterlony Double immunoDiffusion

Food and Industrial Microbiology

17. Examination of Different Food samples.
18. MBRT
19. Alcohol (Ethanol) production using *Vitis vinifera*.
20. Immobilization of Yeast.

Text Books:

1. Anantha Narayanan and Paniker, C.K.J. Text Book of Microbiology, Orient Longmann.

References

1. P.Palanivelu, 2000.Analytical Biochemistry and Separation Techniques, 3rd Ed., 21st century Publications.
2. Rangasamy, G and Bagyaraj, D.J. 1993. Agricultural Microbiology, 2nd Ed., Prentice- Hall Publications.
3. Hley Bicknell and Gilstrap. Microbiological experiments: A Health Science perspective Wm. C. Brown Publishers.



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VI SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | C A | SE | Tot | Crd |
|--------------|--------------|------------------------|--|-----------|----------|-----|----|-----|-----------|
| 1 | 17UMBC61 | Part-III Core | Virology (Core) | 5 | 3 | 25 | 75 | 100 | 5 |
| 2 | 17UMBC62 | Part-III Core | Biochemistry and Enzymology (Core) | 5 | 3 | 25 | 75 | 100 | 5 |
| 4 | 17UMBC63 | Part-III Core | Recombinant DNA Technology (Core) | 5 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17UMBE61 | Part-III **Elective | Bioinformatics | 5 | 3 | 25 | 75 | 100 | 5 |
| 6 | 17UMBE62 | Part-III **Elective | Analytical Microbiology | 5 | 3 | 25 | 75 | 100 | 5 |
| 7 | 17UMBE63 | Part-III **Elective | Fermentation and Bioprocess Technology | 5 | 3 | 25 | 75 | 100 | 5 |
| 6 | 17UMBCP4 | Part-III Core | Core Practicals-IV | 5 | 3 | 40 | 60 | 100 | 4 |
| 7 | 16UGKB61 | | General Knowledge | - | - | - | - | 100 | - |
| Total | | | | 30 | | | | | 28 |

****Two papers has to be chosen out of Three elective papers**

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|----------------------------|-------------------------------|---------------------------------|
| PART - III CORE | Title : VIROLOGY | Subject Code : 17 UMBC61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To enlighten the students with the concepts in Virology

Unit: I Introduction - History, Structure & Composition of Viruses, Cultivation of Viruses – Methods, Assay and Purification Methods.

Unit: II Bacteriophages – Replication, One Step Growth Curve, Lytic (T4 and Lambda), and Lysogenic (P1 & Lambda) replication of bacteriophages. Filamentous phages – M13 and Q β , Structure, Replication and applications.

Unit: III Animal viruses – Structure and Replication of Simion Virus 40, Herpes Simplex Virus, Adenoviruses, Poxviruses and Retroviruses.

Unit: IV Plant viruses – Structure and Replication of Tobacco Mosaic Virus , Cauliflower Mosaic Virus and Cucumber Mosaic Virus, Prions and Viroids.

Unit: V Human Viruses: Symptoms and Pathogenesis of Common cold, Influenza, Rubella, Mumps, Measles, and Chicken pox, Interferon's and Phage therapy.

Text Books:

1. Dimmock, N. J., Easton, A.J and Leppard, K. N. 2001. Introduction to Modern Virology, 5th Ed., Blackwell Publications.

References:

1. David O. White and Frank J. Fenner. Medical Virology, 4th Ed., Academic Press.



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|----------------------------|---|---------------------------------|
| PART - III CORE | Title : BIOCHEMISTRY AND ENZYMOLGY | Subject Code : 17 UMBC62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To make the students appreciate the importance of Biochemistry to life.

Unit I: Water and Life – pH and Buffers, Laws of Thermodynamics, Oxidation and Reduction reactions – Redox potential, Free energy – Exothermic and Endothermic reactions.

Unit II: Carbohydrates – Biological significance, Classification, Glycolysis, TCA Cycle, Oxidative Phosphorylation, Lipids – Fatty acids – Classification – Physical and Chemical properties, Fatty acid Biosynthesis and Oxidation (β -Oxidation).

Unit III: Proteins – Structure and Classification- Primary, Secondary, Tertiary and Quaternary Structure of proteins- Properties of amino acids, Biosynthesis of Glutamic acid and Lysine.

Unit IV: Nomenclature, Classification and Properties of Enzymes, Steady State Kinetics and derivation of Michaelis-Menton and Lineweaver Burk Equation plot. Mechanism and action of enzymes-Lock and Key model.

Unit V: Allosteric enzymes –Aspartate transcarbamylase – Multienzyme Complex – Pyruvate Dehydrogenase, Extraction and Purification of Enzymes, Applications of Enzymes (Clinical & Industrial).

Text Books:

1. Lehninger, A. L.2000. Principles of Biochemistry, 3rd Ed., Macmillan Publications.
2. Stryer, L.1997. Biochemistry, 4th Ed., W. H. Freeman and Company, NY.

References:

1. Palanivelu, P. 2000. Analytical Biochemistry and Separation Techniques, 3rd Ed., 21st Century Publications.



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|----------------------------|---|---------------------------------|
| PART - III CORE | Title : RECOMBINANT DNA TECHNOLOGY | Subject Code : 17 UMBC63 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To teach the basics of Cloning to the Students.

UNIT I:

Introduction to Gene Manipulation, Restriction-Modification System- Nomenclature, Properties and Applications.

UNIT II:

Cloning Vectors-Plasmids – pBR 322 and pUC vectors, Cosmids, Bacteriophages, Prokaryotic Expression Vectors, Broad-Host Range and Shuttle vectors, Eukaryotic – YAC vectors.

UNIT III:

Cloning -*Escherichia coli* and *Bacillus* as host. Construction and Screening of Genomic library and cDNA library.

UNIT IV:

Recombinant Selection - Blue/White, Plaque Forming Assay and Blotting – Southern and Colony Hybridization.

UNIT V:

Application of Recombinant DNA Technology in A) Agricultural - Ti Plasmid and their uses B) Pharmaceutical Industries: Production of Insulin, Interferon, Growth Hormone from microorganisms. C) Protein Engineering and Drug Design. D) Transgenic Plants, animals and Genetically Modified Microorganisms (with one example). Biohazards and Biosafety.

Text Books:

Brown .T.A.2001. Genecloning and DNA analysis an Introduction .4th Ed., Black well Science.

References:

1. Bourgaize jewell. Buiser Biotechnology-Demistifying the concepts- Pearson Education.
2. Watson. J.D, Gilman .M, Witkowski. J and Zoller. M. 1992.Recombinant DNA 2nd Ed., Scientific American Books.



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|--------------------------------|-------------------------------|---------------------------------|
| PART - III ELECTIVE | Title : BIOINFORMATICS | Subject Code : 17 UMBE61 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To inculcate the concepts in the applications of Information Technology in Microbiology to the students.

Unit: I

Block Diagram of Computers, Hardware - Input/output devices, Storage devices, Graphic devices, Operating Systems – Layers of an OS, types and functions of OS, Networks – LAN, WAN, MAN, Internet and Intranet.

Unit: II

Web Browsers – Examples, Search Engines – General purpose and Scientific search engines, Meta Search engines, Use of Commercial software: Microsoft Word, Power Point, Excel and Photoshop – Brief Descriptions only.

Unit: III

Databases - Biological databases – Primary, Secondary and Composite Databases with examples.

Unit: IV

Biological websites – PubMed, MedLine, Science daily, Microbiology online, Science Journals – ISSN and Impact factor.

Unit: V

Accessing information through internet – CCOD and Bionet Newsgroups- WWW Software - HTTP and HTML.

Text Books:

1. Hooman H. Rashidi and Lukas K. Buehler, Bioinformatics Basics – Applications in Biological Science and Medicine, CRC Press, Washington D. C.
2. Ignacimuthu .S. 2005.Basic Bioinformatics, Narosa Publishing house Pvt,Ltd.
3. Attwood.T.K and Parry Smith.D.J.1999.Introduction to Bioinformatics, Pearson Education Asia

References:

1. Arthur M. Lesk, Introduction to Bioinformatics, Oxford University Press.



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| | | |
|--------------------------------|--|----------------------------------|
| PART - III ELECTIVE | Title : ANALYTICAL MICROBIOLOGY | Subject Code : 17 UMB E62 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives: To provide an insight to analytical concepts to the students for research purposes.

UNIT I:

Separation Techniques-centrifuge-principle-Types of centrifuges -Applications.

UNIT II:

Separation of Nucleic acids-DNA, RNA-Agarose gel electrophoresis Principle-methodology-Applications.

UNIT III:

Separation of proteins-Principle native PAGE-SDS PAGE- Principle-Methodology-application.

UNIT IV:

Chromatography –Types –Thin Layer Chromatography, Paper Chromatography. High Performance Liquid Chromatography.

UNIT V:

Pharmaceuticals quality tests-pyrogen tests, sterility test, microbial limit test (MLT) Minimum inhibitory concentration (MIC and MLC).

Text Books:

1. Dubey, R.C.1999.Text Book of Biotechnology, S Chand and company Ltd.
2. Palanivelu,P. 2004. Analytical Biochemistry and Separation technology

References:

1. Keith wilson and John walker.1994.Practical biochemistry- Principles & techniques, 4th Ed.,Cambridge University Press.
2. Hans Peter Schmauder. 2003. Methods in Biotechnology, Taylor & Francis.



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| | | |
|--------------------------------|---|----------------------------------|
| PART - III ELECTIVE | Title : FERMENTATION AND BIOPROCESS TECHNOLOGY | Subject Code : 17 UMB E63 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 5 |

Objective:

To enlighten the concepts in Fermentation Technology among the students.

UNIT I: Concepts of basic modes of Fermentation – Batch, Fed batch and continuous fermentation.

UNIT II: Bioreactor – Designs, types – Airlift, CSTR.

UNIT III: Large scale fermentation- Penicillin, Ethanol.

UNIT IV: Bioprocess for the production of biomass, Primary and Secondary metabolites, Enzymes and Microbial Cells.

UNIT V: Instrumentation and Control Bioprocess, Computer applications in the control of bioprocess.

References:

1. Young, M.M. 2004. Comprehensive Biotechnology, Principles, applications and Regulations of Biotechnology in Industry, Agriculture and Medicine, Vol 1,2 ,3 and 4 Reed Elsevier India Pvt. Ltd.,
2. Stanbury, P.F., Whitaker, A and Hall, S. J. 1995. Principles of Fermentation Technology. 2nd Ed., Elsevier India Pvt. Ltd.,
3. Cassida, 1994. Fermentation Technology
4. Patel, A.H. 1985. Industrial Microbiology. MacMillan India Pvt. Ltd.



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| | | |
|----------------------------|------------------------------------|----------------------------------|
| PART - III CORE | Title : CORE PRACTICAL – IV | Subject Code : 17 UMB CP4 |
| Semester : VI | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives: To provide hands-on teaching experience for the students in Biochemistry, rDNA technology and Virology.

1. Estimation of Carbohydrates DNS Method.
2. Estimation of Proteins – Lowry's Method.
3. Separation of aminoacids by Paper Chromatography.
4. Transformation (Blue/White Selection).
5. Restriction Digestion Analysis
6. Biological Databases – GenBank and PIR –. Theoretical explanation only.
7. Egg Inoculation Technique - Theoretical explanation only.
8. Isolation and separation of plasmid DNA

References:

1. Palanivelu, P. 2000. Analytical Biochemistry and Separation Techniques. 3rd Ed., 21st Century Publications.
2. Jeffrey H. Miller. A Short Course in Bacterial Genetics, Cold Spring Harbour Laboratory Press.
3. Lesk, M. Introduction to Bioinformatics, Oxford University Press.



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I SEMESTER

| Sl.No. | Subject Code | Nature | Subject Title | Hrs /Week | Exam hrs | CA | SE | Tot | Crd |
|--------|--------------------|-----------------|-----------------------|-----------|----------|----|----|-----|-----------|
| 1 | 17 UAC T11/H11/S11 | PART I | Tamil/Hindi/Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17 UAC E11 | PART II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17 UMC C11 | PART-III CORE | Differential Calculus | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 UMC C12 | PART-III CORE | Discrete Mathematics | 4 | 3 | 25 | 75 | 100 | 3 |
| 5 | 17 UMC A11 | PART-III ALLIED | C Language Theory | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17 UMC SP1 | PART-IV SBS | C Language Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | 14 UAC VE1 | PART-IV | Value Education | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 22 |

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|------------------------|--------------------------------------|----------------------------------|
| Part III : CORE | Title : DIFFERENTIAL CALCULUS | Subject Code : 17 UMC C11 |
| Semester : I | Hours : 4 Hours / Week | Credits : 4 |

Objectives:

To develop the Students to know about Differential Calculus.

UNIT –I

Differentiation- Standard forms- general theorems on differential coefficients- Logarithmic differentiation-Differentiation of implicit functions- Differentiation of one function with respect to another.

UNIT-II

Successive differentiation: The n^{th} derivative - Standard results-Trigonometrical transformations- Formations of equations involving derivative.- Leibnitz's formula.

UNIT –III

Partial differentiation- Successive partial derivatives- Function of function rule- Total differential coefficient- Special case- Homogeneous functions- Partial derivatives of a function of two functions.

UNIT-IV

Tangents and normal-Equation of the tangent and normal at any point of the curve – Angle of intersection of curves sub tangent and sub normal – Length of arc- Polar co-ordinates.

UNIT-V

Envelopes, curvature of plane curves- Curvature- centre of curvature- Radius of curvature- co-ordinates of centre of curvature- Evolute and involute – p-r equations.

Textbook : Calculus – Volume I

Author : S.Narayanan, T.K.Manickavasakam Pillai.

Publication : S.Visvanathan(Printers & Publisers) PVT LTD - 2009

| UNIT | CHAPTER | SECTION |
|-------------|----------------|----------------|
| I | II | 2-7 |
| II | III | 1-2 |
| III | VIII | 1.1-1.7 |
| IV | IX | 1.1-4.6 |
| V | X | 2.1-2.8 |

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|------------------------|-------------------------------------|----------------------------------|
| Part III : CORE | Title : DISCRETE MATHEMATICS | Subject Code : 17 UMC C12 |
| Semester : I | Hours : 4 Hours / Week | Credits : 3 |

Objectives:

To develop the Students to know about Discrete Mathematics.

UNIT -I

RELATIONS: Cartesian product of two sets- Relations- Representation of relations- Operations of relations- Composite relations- Equivalence relations.

UNIT-II

CODING THEORY: Introduction- Hamming distance- Encoding message- Group codes- Decoding and error correction-An example of single error – Correcting code.

UNIT-III

True false statements – connectives – Atomic compound statements – Parsing trees – Truth table of formula – Tautology – Tautological implementations and formulae – Replacement process.

UNIT-IV

Normal forms – Disjunctive normal form and conjunctive normal form – Principle disjunctive normal form and principle conjunctive normal form.

UNIT-V

Lattices – Hasse diagram – Properties of Lattices – New lattices – Lattice homomorphism.

TEXT BOOK: DISCRETE MATHEMATICS

AUTHOUR : Dr.M.K.VENKADARAMAN, Dr.N.SRIDHARAN,
V.CHANDRASEKARAN.

PUBLICATIONS: THE NATIONAL PUBLISHING COMPANY-2012

| UNIT | CHAPTER | SECTION |
|------|---------|---------|
| I | 2 | 2,3,4,5 |
| II | 8 | 1-7 |
| III | 9 | 2-9 |
| IV | 9 | 11-12 |
| V | 10 | 1-3 |

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|--------------------------|----------------------------------|----------------------------------|
| PART III : ALLIED | Title : C LANGUAGE THEORY | Subject Code : 17 UMC A11 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

To develop the Students to know about C-Language Theory.

Unit I C Program – The form - Character Set – C Token – C Identifiers – Keywords – Constants – Data types – Variables – Float – Character – Void – The ‘const’ keyword – Operators – Assignment operators – Arithmetic operators – Relational operators – Logical operators – Auto Increment / Decrement operators – Ternary operator

Unit II scanf function – printf function – Simple if statement – Simple if-else statement – Bloc if statement – Block if-else statement – Nested ifs – Looping – for loop – looping using while – looping using do-while – break statement – continue statement – exit () function – switch statement – goto statement

Unit III One dimensional array – array initialization – two dimensional array – initialization of two dimensional arrays – two dimensional sorting – multidimensional arrays – what is a C function – return statement – calling a function – call by value – call by reference –calling a function with no argument and no return value – calling a function with arguments but no return value – calling a function with arguments and return values – nesting functions – functions with arrays – recursion

Unit IV Declaration of string variable – reading string – writing string – string handling functions – string handling using library functions – array of strings – what is a pointer – pointer operators – how to access a variable through pointer – pointer expression – call by value – call by reference

Unit V What is a structure – giving values to structure elements – structure initialization – arrays of structure – arrays within structure – nested structure – union – typedef – enumerated data type.

- Textbook(s) : C Programming
- Author(s) : P.RadhaGanesan
- Publisher(s) : SciTech Publications
- Reference(s) : Programming in ANSI C by E.Balagurusamy

| UNIT | CHAPTER | SECTION |
|------|---------|-----------------|
| I | 1&2 | 1.9-2.18 |
| II | 3&4 | 3.2,3.5,4.2-4.6 |
| III | 5&6 | 5.1-5.7,6.1-6.8 |
| IV | 7&8 | 7.1-7.6,8.1-8.6 |
| V | 10 | 10.1-10.13 |

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| | | |
|--------------------------------|-------------------------------|----------------------------------|
| PART – IV SBS | Title : C LANGUAGE LAB | Subject Code : 17 UMC SP1 |
| Semester : I | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives:

To develop the Students know about C Language Lab.

1. To calculate Simple Interest and Compound Interest
2. To calculate Sum of first n natural numbers
3. To find the biggest number among 3 numbers
4. To calculate the temperature from Celsius to Fahrenheit
5. To solve quadratic equation
6. To arrange the numbers in Ascending Order.
7. To find the product of two square matrices.
8. To compute the surface area and volume of a cube
9. To accept 'n' integers and store them in an array ar. The odd elements in the ar are copied into oar and other elements are copied into ear. Display the contents of oar and ear.
10. To find the reverse the number and its sum of the digits.
11. To find any one of the special numbers (Armstrong / Adam / Prime / Perfect)
12. To generate nth Addition / Multiplication Table where n and range are given.
13. To swap using temporary variable, arithmetic, and xor operators.
14. Check whether the given two square matrices are equal or not.

TEXT BOOK: As per Theory Paper

REFERENCE BOOK: As per Theory Paper

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II SEMESTER

| S. No | Sub. Code | Nature | Subject Title | Hrs /Week | Exam hrs | CA | SE | Tot | Crd |
|-------|--------------------|-----------------|-----------------------|-----------|----------|----|----|-----|-----------|
| 1 | 17 UAC T21/H21/S21 | PART I | Tamil/Hindi/Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17 UAC E21 | PART II | English | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17 UMC C21 | PART-III CORE | Integral Calculus | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 UMC C22 | PART-III CORE | Classical Algebra | 4 | 3 | 25 | 75 | 100 | 3 |
| 5 | 17 UMC A21 | PART-III ALLIED | C++ Language Theory | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17 UMC SP2 | PART-IV SBS | C++ Language Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | 14 UAC ES1 | PART-IV | Environmental Studies | 2 | 3 | 25 | 75 | 100 | 2 |
| | | | Total | 30 | | | | | 22 |

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| | | |
|--------------------------|----------------------------------|----------------------------------|
| Part III CORE | Title : INTEGRAL CALCULUS | Subject Code : 17 UMC C21 |
| Semester : II | Hours : 4 hours /week | Credits : 4 |

Objectives:

To develop the Students know about the Integral Calculus.

UNIT-I

Integration- Definite integral- Methods of integration- Integrals of functions- Involving a^2+x^2 forms of integrals.

UNIT –II

Integration of rational algebraic forms- Special cases- Integration of irrational functions.

UNIT –III

Properties of definite integrals- Integration by Parts- Reduction formulae-Bernoulli's formula.

UNIT-IV

Multiple integrals - Definition of double integrals- double integral in polar coordinates-Triple integrals.(Problems only)

UNIT-V

β and γ functions- Definitions- Recurrence formula of γ functions- Properties of β functions.- Relation between β and γ functions.

TEXT BOOK: CALCULUS-VOLUME II

AUTHOUR: S.NARAYANAN,T.K.ManicavasamPillai

PUBLICATIONS : S.VISVANATHAN. (Printers & Publishers) -Pvt.Ltd.-2009

| UNIT | CHAPTER | SECTION |
|-------------|----------------|----------------|
| I | I | 1- 6 |
| II | I | 7-10 |
| III | I | 11-15.1 |
| IV | V | 1-4 |
| V | VII | 2-5 |

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| | | |
|----------------------------|----------------------------------|----------------------------------|
| PART - III CORE | Title : CLASSICAL ALGEBRA | Subject Code : 17 UMC C22 |
| Semester : II | HOURS : 4 hours /week | CREDITS : 3 |

Objectives:

To develop the Students know about classical algebra

UNIT –I

SEQUENCES: Introduction – Bounded sequences – Monotonic sequences – problems – Divergent and oscillating sequences – The algebra of limits – Problems.

UNIT-II

Behaviors of monotonic sequences – Some theorems on limits – Cesaro's theorems – Cauchy's second limit theorem – Problems.

UNIT– III

SERIES AND POSITIVE TERMS: Definite series – Cauchy's general principle of convergence – Comparison test – Kummer's test – D'Alembert's ratio test – Raabe's test – Gauss test – Problems.

UNIT-IV

THEORY OF EQUATIONS: Introduction – Formation of equations – Relation between roots and co-efficients – Reciprocal equations – Problems.

UNIT-V

Transformations of equations – Removal of terms – Nature and position of roots – Descarte's rule of sign – Approximate solutions of numerical equations – Newton's method and Horner's method.

TEXT BOOK: (i) Sequence and series for unit I, II, III, New Gamma Publishing house, Edition 2006

(ii) Algebra for unit IV, V New Gamma Publishing house , Edition 2011.

AUTHOUR: Dr.S.ARUMUGAM & S. THANGAPANDI ISSAC.

| UNIT | CHAPTER | SECTION |
|-------------|----------------|----------------|
| I | 3 | 3.0-3.6 |
| II | 3 | 3.7,3.8 |
| III | 4 | 4.1-4.3 |
| IV | 5 | 5.1,5.2,5.4 |
| V | 5 | 5.5,5.7,5.10 |

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| | | |
|--------------------------|------------------------------------|----------------------------------|
| PART – III ALLIED | Title : C++ LANGUAGE THEORY | Subject Code : 17 UMC A21 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

To develop the Students know about C++ Language Theory.

Unit I : Software Evolution – Basic Concepts of Objects Oriented Programming – Benefit of Object Oriented Programming - Applications of Objected Oriented Programming - What is C++ - An Example with Class – Structure of C++ Program

Unit II : Tokens – Keywords – Identifiers & Constants – Basic Data Types – User-Defined Data Types – Derived Data Types – Operators in C++ - Scope Resolution Operator – Expressions and their types – Operator Overloading – Control Structures

Unit III : Inline functions – Default Arguments – Function Overloading – Specifying a Class – Defining Member Functions – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Memory Allocation for Objects – Static Data Members – Static Member Functions – Array of Objects – Objects as Function Arguments – Friendly Functions – Pointers to Members

Unit IV : Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructor – Dynamic Constructors – Destructors – Defining Operator Overloading – Overloading Unary Operators - Overloading Binary Operators – Rules for Overloading Operators

Unit V : Introduction to Inheritance – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance - Hybrid Inheritance – Virtual Base Class – Constructors in Derived Class – Pointers to Objects – this Pointer – Virtual Functions

Textbook(s) : Programming in ANSI C++ by E.Balagurusamy

| UNIT | CHAPTER | SECTION |
|-------------|----------------|---------------------|
| I | 1&2 | 1.2,1.5-1.8,2.1-2.6 |
| II | 3 | 3.1-3.7,3.13-3.24 |
| III | 4&5 | 4.6-4.9,5.3-5.18 |
| IV | 6&7 | 6.2-6.11,7.2-7.7 |
| V | 8&9 | 8.1-8.11,9.3-9.6 |



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| | | |
|----------------------|---------------------------------|----------------------------------|
| PART – IV SBS | Title : C++ LANGUAGE LAB | Subject Code : 17 UMC SP2 |
| Semester : II | HOURS : 3 hours / Week | CREDITS : 3 |

Objectives:

To develop the Students know about C++ Language Lab.

C++ PROGRAMMING LAB

1. To perform Area calculation using Function overloading (min three functions).
2. To perform string manipulation using functions overloading.
3. To demonstrate the concept of friend function.
4. To swap two values between two classes objects using friend function.
5. To find minimum of two numbers between two classes objects using friend function.
6. To overload unary minus operator which changes sign of given vector (3 elements).
7. To overload Binary +operator which adds two complex numbers?
8. Implementation of mathematical operations on strings { Overload two operators + and <= }
9. To demonstrate single inheritance of a public data member and a private data member
10. To process students mark list using multiple inheritance.
11. To process employee details using hierarchical inheritance.
12. To process inventory details using multilevel inheritance.
13. To process family details using hybrid inheritance
14. To illustrate the use of Virtual base class
15. To illustrate the macro definition.

TEXTBOOK : Programming in ANSI C++ by E.Balagurusamy

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III SEMESTER

| S. No | Subject Code | Nature | Subject Title | Hrs / Week | Exam hrs | CA | SE | Total | Crd |
|--------------|--------------------|-----------------|---------------------------------|------------|----------|----|----|-------|-----------|
| 1 | 17 UAC T31/H31/S31 | PART I | Tamil/Hindi/Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE31 | PART II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UMCC31 | PART-III CORE | Modern Algebra | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UMCC32 | PART-III CORE | Differential equations | 4 | 3 | 25 | 75 | 100 | 3 |
| 5 | 17UMCA31 | PART-III ALLIED | VISUAL BASIC Theory | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17UMCSP3 | PART-IV SBS | VISUAL BASIC Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | 17UMCN31 | PART-IV NME | FUNDAMENTALS of Mathematics - I | 2 | 3 | 25 | 75 | 100 | 2 |
| Total | | | | 30 | | | | | 22 |

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| | | |
|----------------------------|-------------------------------|----------------------------------|
| PART - III CORE | Title : MODERN ALGEBRA | Subject Code : 17 UMC C31 |
| Semester : III | HOURS : 4 hours /week | CREDITS : 4 |

Objectives:

To develop the Students know about Modern Algebra.

UNIT I SET

Introduction – The concept of a set – Set inclusion – Union of sets – Intersection of sets – Difference of sets – Complement of a set – Symmetric Difference of two sets – Cartesian product of sets.

UNIT II RELATIONS AND MAPPING

Relations – Equivalence Relations – Partial order - Functions – Binary Operations.

UNIT III GROUPS

Introduction – Definition and Example – Elementary Properties of a Group – Equivalent Definitions of a Group - Permutation Groups - Subgroups – Cyclic Groups .

UNIT IV GROUPS

Order of an Element - Cosets and Lagrange's Theorem – Normal Subgroups and Quotient Groups – Isomorphism – Homomorphisms.

UNIT V RINGS

Definition and Example – Elementary properties of rings – Isomorphism – Types of rings – Characteristic of a ring – Subrings.

TEXT: Modern Algebra, S.Arumugam, Isaac, Scitech Publications, Edition 2003.

| | | | | |
|----------|---------|---|---------|--|
| UNIT I | CHAPTER | 1 | SECTION | 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8. |
| UNIT II | CHAPTER | 2 | SECTION | 2.1, 2.2, 2.3, 2.4, 2.5. |
| UNIT III | CHAPTER | 3 | SECTION | 3.0, 3.1, 3.2, 3.3, 3.4, 3.5,3.6 |
| UNIT IV | CHAPTER | 3 | SECTION | 3.7, 3.8, 3.9, 3.10, 3.11. |
| UNIT V | CHAPTER | 4 | SECTION | 4.1, 4.2, 4.3, 4.4, 4.5, 4.6. |

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| | | |
|----------------------------|---|----------------------------------|
| PART - III CORE | Title : DIFFERENTIAL EQUATIONS | Subject Code : 17 UMC C32 |
| Semester : III | HOURS : 4 hours /week | CREDITS : 3 |

Objectives:

To develop the Students know about Differential Equations.

UNIT I

Differential Equation – Equations of First Order and First Degree – Exact Differential Equations – Integrating Factors – Linear Equations – Bernoulli's Equations.

UNIT II

Linear Equations of Higher Order – Linear Equation with Constant Co-efficients – Methods of Finding complementary Functions – Methods of Finding Particular Integrals – Homogeneous Linear Equations.

UNIT III

Linear Equations with Variable Coefficients – Removal of First Derivative – Changing the Independent Variables – Methods of Variation of Parameters – Simultaneous Linear Differential Equations.

UNIT IV Laplace Transform – Inverse Laplace Transform and application of D.E using Laplace Transform.

UNIT V Partial Differential Equations – Formation – Elimination of Arbitrary Functions – First Order Partial Differential Equations – Lagrange's Equations – Standard Forms.

Textbook(s) : Differential Equations & Applications
Author(s) : Dr. S.Arumugam & Prof. A.Thangapandi Issac
Publication(s) : New Gamma Publishing House, 2008

| | | |
|----------|-----------|--------------------|
| Unit I | Chapter 1 | Section: 1.1 – 1.6 |
| Unit II | Chapter 2 | Section: 2.1 – 2.4 |
| Unit III | Chapter 2 | Section: 2.5 – 2.6 |
| Unit IV | Chapter 3 | Section: 3.1 – 3.2 |
| Unit V | Chapter 4 | Section: 4.1 – 4.4 |

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| | | |
|------------------------------------|------------------------------------|----------------------------------|
| PART - III ALLIED | Title : VISUAL BASIC THEORY | Subject Code : 17 UMC A31 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

To develop the Students know about Visual Basic Theory.

Unit I

Introduction to Visual Basic – Visual Basic 6.0 Programming Environment – Working with Forms – Developing an application

Unit II

Variables, Data types and Modules – Procedures and Control Structures – Arrays in Visual Basic – Examples & Exercises

Unit III

Introduction - Creating and Using Controls – Working with Control Arrays – Examples & Exercises

Unit IV

Introduction – Mouse Events – Dialog Boxes – Examples & Exercises

Unit V

Introduction - Graphics for Application – Multiple Document Interface – Using FlexGrid Control – Examples & Exercises

TEXT: Visual Basic 6.0 Programming, Content Development Group, TMH Publications, Chennai.

| | | | |
|----------|----------|------------------------|------------------|
| UNIT I | Sections | 1.1, 1.2, 1.3, and 1.4 | Pages: 001 – 017 |
| UNIT II | Sections | 1.5, 1.6, and 1.7 | Pages: 017 – 033 |
| UNIT III | Sections | 2.1, 2.2, and 2.3 | Pages: 067 – 083 |
| UNIT IV | Sections | 3.1, 3.2, and 3.3 | Pages: 109 – 128 |
| UNIT V | Sections | 4.1, 4.2, 4.3, and 4.4 | Pages: 162 – 179 |

REFERENCE:EBook:Computer Programming Concepts & Visual Basic, David I. Schneider



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| | | |
|--------------------------------|---------------------------------|----------------------------------|
| PART - IV SBS | Title : VISUAL BASIC LAB | Subject Code : 17 UMC SP3 |
| Semester : III | HOURS : 3 hours /week | CREDITS : 3 |

Objectives:

To develop the Students know about Visual Basic Lab.

1. Write a program in VB to manipulate arithmetic / string operations.
2. Write a program in VB to manipulate matrix operations.
3. Write a program in VB to check whether Adam / Armstrong / Perfect / Prime or not.
4. Write a program in VB to print Fibonacci sequences for a given range.
5. Write a program in VB to calculate Simple Interest / Compound Interest / EMI
6. Write a program in VB to generate EB Bill / Student Mark sheet / Result Analysis.
7. Write a program in VB to generate Customer / Employee / Student Report.
8. Write a program in VB to create simple explorer using controls.
9. Write a program in VB to display student data using controls.
10. Write a program in VB to create login / logoff form.
11. Write a program in VB to create a database using controls.
12. Write a program in VB to sort given numbers / strings.

REFERENCE: Visual Basic 6.0 Programming, Content Development Group, TMH Publications, Chennai.

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| | | |
|-----------------------|---|----------------------------------|
| PART IV : NME | Title : FUNDAMENTALS OF MATHEMATICS- I | Subject Code : 17 UMC N31 |
| Semester : III | Hours : 2 Hours / Week | Credits : 2 |

Objectives:

To enable the students to acquire the basic knowledge in Calculus and matrices.

Unit I

Theory of indices, ratio and proportion.(Page 54 to 65 in Text Book)

Unit II

Differential calculus and Integral calculus (Simple problems). (Page 192 to 235 and Page 283 to 308 in Text Book)

Unit III

Theory of Matrices-Addition, Multiplication of two matrices.
(Page 329 to 375 in Text Book)

Unit IV

Finding the nth term and sum to n terms of an A.P and G.P-Arithmetic mean.

Unit V

Solving the quadratic equations-finding the roots- forming the equation when roots are given (only second degree).

Text Book:

Business mathematics by .M.Manoharan, Dr.C.Elango and K.L.Eswaran,Paramount publications-Reprint 2007.

| | |
|----------|--------------------------|
| Unit I | Page No: 54-65 |
| Unit II | Page No: 192-235,283-308 |
| Unit III | Page No: 329-375 |
| Unit IV | Refer Relevant Book |
| Unit V | Refer Relevant Book |

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IV SEMESTER

| S. No. | Subject Code | Nature | Subject Title | Hours / Week | Exam hrs | CA | SE | Total | Crd |
|--------|--------------------|-----------------|--------------------------------|--------------|----------|----|----|-------|-----------|
| 1 | 17 UAC T41/H41/S41 | PART I | Tamil/Hindi/Sanskrit | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17UACE41 | PART II | ENGLISH | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17UMCC41 | PART-III CORE | Linear Algebra | 4 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17UMCC42 | PART-III CORE | Number Theory | 4 | 3 | 25 | 75 | 100 | 3 |
| 5 | 17UMCA41 | PART-III ALLIED | JAVA Language Theory | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17UMCSP4 | PART-IV SBS | JAVA Language Lab | 3 | 3 | 40 | 60 | 100 | 3 |
| 7 | 17UMCN41 | PART-IV NME | Fundamentals of Mathematics II | 2 | 3 | 25 | 75 | 100 | 2 |
| 8 | | PART-V | Extension Activities | 0 | | | | 100 | 1 |
| | | | Total | 30 | | | | | 23 |

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| | | |
|----------------------------|-------------------------------|----------------------------------|
| PART - III CORE | Title : LINEAR ALGEBRA | Subject Code : 17 UMC C41 |
| Semester : IV | HOURS : 4 hours /week | CREDITS : 4 |

Objectives:

To enable the students to acquire the basic knowledge in Linear Algebra.

UNIT I

Vector spaces – Definition and Examples – Subspace – Linear Transformation-
Fundamental theorem of homomorphism.

UNIT II

Span of a Set – Linear Independents – Basis and Dimensions – Rank Nullity – Matrix
of a Linear Transformation.

UNIT III

Inner product space – Definition and Examples – Orthogonality – Orthogonal
Complement.

UNIT IV

Introduction – Algebra of Matrices – Types of Matrices – The Inverse of the Matrix –
Elementary Transformations – Rank of Matrix – Simultaneous Linear Equations –
Characteristics Equation and Cayley – Hamilton Theorem – Eigen Values and Eigen Vectors.

UNIT V

Introduction – Bilinear forms – Matrix of a bilinear form – Quadratic forms –
Reduction to Quadratic form.

Textbook(s) : Modern Algebra
Author(s) : Dr. S.Arumugam & Prof A.Thangapandi Issac
Publication(s) : 2003, Scitech Publications (India) Private Ltd, Chennai.

| | | | |
|----------|-----------|----------|---------|
| Unit I | Chapter 5 | Section: | 5.1-5.3 |
| Unit II | Chapter 5 | Section: | 5.4-5.8 |
| Unit III | Chapter 6 | Section: | 6.1-6.3 |
| Unit IV | Chapter 7 | Section: | 7.1-7.8 |
| Unit V | Chapter 8 | Section: | 8.0-8.2 |

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|----------------------------|------------------------------|----------------------------------|
| PART - III CORE | Title : NUMBER THEORY | Subject Code : 17 UMC C42 |
| Semester : IV | HOURS : 4 hours /week | CREDITS : 3 |

Objectives:

To develop the Students know about Number Theory.

UNIT-I

DIVISIBILITY: Divisibility of integers – Division of Algorithms – Greatest common divisor – Least common multiple – Examples.

UNIT II

PRIME AND COMPOSITE NUMBERS: Prime number – Composite number – Co-primes – Twin primes – Euclid’s theorem – Unique factorization theorem – Divisors of integers – Arithmetic functions – product of divisors – Perfect numbers – Euclid’s theorems – Euler functions – Example problems.

UNIT III

DISTRIBUTION OF PRIMES: Introduction – Fermat’s conjecture – Mersenne number – Gap theorem – Example problems.

UNIT IV

CONGRUENCES: Definitions – Theorems – Residue theorem – Magic numbers – Divisibility tests – Linear congruence – Chinese Remainder theorem.

UNIT V

THEOREMS OF FERMAT’S WILSON: Introduction – Fermat’s theorem – Wilson’s theorem – Lagranges’s theorem – Wolstenholme theorem.

TEXT BOOK: ELEMENTS OF NUMBER THEORY.

AUTHOUR: KUMARAVELU & SUSHEELA KUMARAVELU.

PUBLICATIONS : SKV – FIRST EDITION 2002.

| UNIT | CHAPTER | PAGENUMBER |
|-------------|----------------|-------------------|
| I | 3 | 45-59 |
| II | 4 | 61-106 |
| III | 5 | 148-162 |
| IV | 6 | 163-206 |
| V | 7 | 208-244 |



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|----------------------|-------------------------------------|----------------------------------|
| PART - III | Title : JAVA LANGUAGE THEORY | Subject Code : 17 UMC A41 |
| ALLIED | | |
| Semester : IV | Hours : 5 Hours / Week | Credits : 3 |

Objectives:

To develop the Students know about Java Language.

UNIT I

Object Oriented Programming Concepts - Features of Java Language - Types of Java Programs - Java Architecture – Literals - Data types - Variables

UNIT II

Structure of a Java program – Comments - Expressions and Statements - Type Conversions - Arithmetic Operators - Bitwise Operators - Relational Operators - Boolean Logical Operators - Ternary Operators (?)

UNIT III

The if ... else statement - The switch statement - The while statement - The do ... while statement - The for statement - The break statement - The continue statement - One-Dimensional Arrays - Multi-Dimensional Arrays

UNIT IV

Defining a Class - The new Operator and Objects - The dot (.) Operator - Method Declaration and Calling – Constructors - Method Overloading – Creating Subclasses - Method Overriding - Object Destruction and Garbage Collection

UNIT V

Package - The import Statement - Access Modifier – Interfaces - Types of Exceptions - Catching Exceptions – Multitasking - Creating a Thread – Applet Basics – Methods of Building an Applet – The HTML Applet Tag – Colors in Applet

TEXT: Programming in Java 2 by Dr. K. Somasundaram

| UNIT | CHAPTER | SECTIONS |
|----------|----------------|--|
| UNIT I | 1 & 2 | 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3 |
| UNIT II | 3 & 4 | 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 4.5 |
| UNIT III | 5 & 6 | 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.1, 6.2 |
| UNIT IV | 7 & 8 | 7.1, 7.2, 7.3, 7.4, 7.5, 7.8, 8.1, 8.2, 8.6 |
| UNIT V | 9, 12, 15 & 16 | 9.1, 9.2, 9.3, 9.4, 12.1, 12.2, 15.1, 15.2, 16.1, 16.2, 16.6, 16.8 |

REFERENCE:

EBook: Java 2, The Complete Reference, Fifth Edition, Herbert Schildt.

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|--------------------------------|----------------------------------|----------------------------------|
| PART - IV SBS | Title : JAVA LANGUAGE LAB | Subject Code : 17 UMC SP4 |
| Semester : IV | Hours : 3 hours / Week | Credits : 3 |

Objectives:

To develop the Students know about Java Language Lab.

1. Write a program in Java to manipulate arithmetic / string operations.
2. Write a program in Java to manipulate matrix operations.
3. Write a program in Java to check whether Adam / Armstrong / Perfect / Prime or not.
4. Write a program in Java to print Fibonacci sequences for a given range.
5. Write a program in Java to calculate Simple Interest / Compound Interest / EMI
6. Write a program in Java to implement function overloading.
7. Write a program in Java to implement operator overloading
8. Write a program in Java to implement single inheritance.
9. Write a program in Java to implement package.
10. Write a program in Java to create console / windows application.
11. Write a program in Java to create applet application.
12. Write a program in Java to sort given numbers / strings.
13. Write a program to read 10 values in an array (assume that you read all values positive). Then change each even value in the array with its half value and each odd value with its double value. After change, count how many values are even and how many values are odd. Display the counting.
14. Write a program to generate the following series :

| | | | | |
|----|----|----|----|----|
| 50 | 40 | 30 | 20 | 10 |
| 60 | 47 | 34 | 21 | 8 |
| 70 | 54 | 38 | 22 | 6 |

REFERENCE:

EBook: Java 2, The Complete Reference, Fifth Edition, Herbert Schildt.



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| | | |
|--------------------------------|---|----------------------------------|
| PART - IV NME | Title : FUNDAMENTALS OF MATHEMATICS – II | Subject Code : 17 UMC N41 |
| Semester : IV | HOURS : 2 hours /week | CREDITS : 2 |

Objectives:

To enable the students to acquire the basic knowledge in statistics

UNIT I:

Mean, median, mode (problems only)

UNIT II:

Geometric mean, Harmonic mean, range, quartile deviation (problems only)

UNIT III:

Mean deviation, standard deviation (problems only)

UNIT IV:

Curve fitting (linear and quadratic only) (Simple Problems only).

UNIT V:

Analysis of Time series (linear trend method and seasonal variation) (problems only)

Text Book:

Statistics by S.Arumugam and Isaac, New Gamma Publications

| UNIT | CHAPTER | SECTIONS |
|-------------|----------------|-----------------|
| UNIT I | 2 | 2.0-2.3 |
| UNIT II | 2 | 2.4,3.1 |
| UNIT III | 3 | 3.1 |
| UNIT IV | 5 | 5.1 |
| UNIT V | 10 | 10.1&10.2 |

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V SEMESTER

| S. No. | Subject Code | Nature | Subject Title | Hours / Week | Exam hrs | C A | SE | Tot | Crd |
|--------|--------------|-------------------|--------------------------------|--------------|----------|-----|----|------------|-----------|
| 1 | 17 UMC C51 | PART-III CORE | Graph Theory | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 17 UMC C52 | PART-III CORE | Real Analysis | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 17 UMC C53 | PART-III CORE | Statistics - I | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 UMC C54 | PART-III CORE | Trigonometry & Vector Calculus | 5 | 3 | 25 | 75 | 100 | 4 |
| 5A | 17 UMCE51 | PART-III ELECTIVE | Web Technology Theory* | 5 | 3 | 25 | 75 | 100 | 5 |
| 5B | 17UMCEP1 | PART-III ELECTIVE | Web Technology Lab* | 5 | 3 | 40 | 60 | 100 | 5 |
| 6A | 17 UMCE52 | PART-III ELECTIVE | Unix Theory* | 5 | 3 | 25 | 75 | 100 | 5 |
| 6B | 17UMCEP2 | PART-III ELECTIVE | Unix Lab* | 5 | 3 | 40 | 60 | 100 | 5 |
| 7 | 16USSS51 | Self Study | Soft Skills | - | - | - | - | 100 | - |
| | | | Total | 30 | | | | 700 | 26 |

***Either (5A & 5B) (or) (6A & 6B) are to be selected as Elective papers**

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| | | |
|----------------------------|------------------------------|----------------------------------|
| PART - III CORE | Title : GRAPH THEORY | Subject Code : 17 UMC C51 |
| Semester : V | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To enable the Students to acquire the basic knowledge in Graph Theory.

UNIT I

Graphs – Degree - Sub graphs, Isomorphism, Ramsey Numbers - Independent Sets and Coverings - Intersection Graphs - Matrices of Graphs - Operations on Graphs.

UNIT II

Degree Sequences - Graphic Sequences - Walks, Trials, and Paths -Connectedness and Components – Blocks - Connectivity

UNIT III

Eulerian Graphs - Hamiltonian Graphs – Trees - Characterization of Trees - Centre of a Tree.

UNIT IV

Chromatic Number and Chromatic Index – The Five Color Theorem - Four Color Theorem - Chromatic Polynomials

UNIT V

Definitions and Basic Properties of Diagraphs - Paths and Connections in Diagraphs – Diagraphs and Matrices

Textbook(s) : Invitation to Graph Theory
Author(s) : Dr. S.Arumugam & S.Ramachandran
Publication(s) : Scitech Publications, Nov 2012

Reference Book(s) :

| | | |
|----------|---------------|-----------------------------------|
| Unit I | Chapter 2 | Sections: 2-2.9 |
| Unit II | Chapter 3 & 4 | Sections: 3.0,3.1,3.2 |
| Unit III | Chapter 5 & 6 | Sections: 4.1-4.4,5.1,5.2,6.1,6.2 |
| Unit IV | Chapter 9 | Sections: 9.1-9.4 |
| Unit V | Chapter 10 | Sections : 10.1-10.3 |

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| | | |
|----------------------------|------------------------------|----------------------------------|
| PART III : CORE | Title : REAL ANALYSIS | Subject Code : 17 UMC C52 |
| Semester : V | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To enable the Students to acquire the basic knowledge in Real Analysis.

UNIT 1:

Sets and Functions – Countable Sets – Uncountable Sets – Inequalities of Holder and Minkowski – Metric Spaces – Definitions and Examples.

UNIT 2:

Bounded Sets in a Metric Space – Open Ball in a Metric Space – Open Sets – Subspaces – Interior of a Set – Closed Sets – Closure – Limit Point – Dense Sets.

UNIT 3:

Introduction – Completeness – Baire's Category Theorem – Continuity – Homeomorphism – Uniform Continuity.

UNIT 4:

Introduction – Definition and Examples – Connected Subsets of \mathbb{R} – Connectedness and Continuity

UNIT 5:

Introduction – Compact Space – Compact Subsets of \mathbb{R} – Equivalent Characterization for compactness.

TEXT: Modern Analysis, S. Arumugam, Issac, New Gamma Publishing House – 2007.

| UNIT | CHAPTER | SECTIONS |
|-------------|----------------|--|
| UNIT I | 1 | 1.1, 1.2, 1.3, 1.4 |
| UNIT II | 2&3 | 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.8, 2.9, 2.10, 3.0, 3.2 |
| UNIT III | 4 | 4.0, 4.1, 4.2, 4.3 |
| UNIT IV | 5 | 5.0, 5.1, 5.2, 5.3 |
| UNIT V | 6 | 6.0, 6.1, 6.2, 6.3 |

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|----------------------------|------------------------------|----------------------------------|
| PART - III CORE | Title : STATISTICS- I | Subject Code : 17 UMC C53 |
| Semester : V | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To enable the Students to acquire the basic knowledge in Statistical methods.

UNIT –I

CENTRAL TENDENTIES: Introduction – Arithmetic mean – Partition values – (Median , Quantities , Decius, percentiles) – Mode – Geometric mean and Harmonic mean .

UNIT-II

MEASURES OF DISPERSION: Introduction – Standard deviation – C.V –Variance.

UNIT –III

CURVE FITTING: Introduction – Principles of least squares – Fitting line and parabola.

UNIT-IV

THEORY OF ATTRIBUTES: Introduction – Attributes – Consistency of data – independence and association of data.

UNIT-V

INDEX NUMBERS: Aggregate method – Simple index numbers – Weighted index numbers – Weighted aggregative method – Weighted average price relative method.

TEXT BOOK: STATISTICS

AUTHOUR: ARUMUGAM & ISSAC.

PUBLISHER: New Gamma Publishing House July 2017.

| UNIT | CHAPTER | SECTIONS |
|-------------|----------------|-----------------|
| I | 2 | 2.1-2.4 |
| II | 3 | 3.0&3.1 |
| III | 5 | 5.0&5.1 |
| IV | 8 | 8.0-8.3 |
| V | 9 | 9.1&9.2 |

Reference Book: Statistical Methods by S.P.Gupta.

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|----------------------------|--|----------------------------------|
| PART - III CORE | Title: TRIGONOMETRY & VECTOR CALCULUS | Subject Code : 17 UMC C54 |
| Semester : V | HOURS : 5 hours /week | CREDITS : 4 |

Objectives: To enable the Students to acquire the basic knowledge in Trigonometry and Vector Calculus.

UNIT –I

Application of De Moivre's theorem.

UNIT-II

Circular and direct Hyperbolic Functions – Circular and inverse Hyperbolic functions.

UNIT III

Skew lines –Shortest distance between two skew lines and its problems.

UNIT IV

Vector calculus – Vector differentiation – Gradient – Directional Derivatives – Divergence and Curl.

UNIT V

Double and Triple integrals. (Simple problems)

TEXT BOOK: Analytic Geometry 3D & vector calculus , Dr.S. Arumugam & Issac , new gamma Publications house 2011.

Trigonometry and fourier series, Arumugam issac Somasundaram,New Gamma Pub. House 1999.

| UNIT | CHAPTER | SECTIONS |
|-------------|----------------|-----------------|
| I | 1 | 1.0-1.4 |
| II | 2 | 2.1 |
| III | 3 | 3.2 |
| IV | 5 | 5.0-5.4 |
| V | 6 | 6.0-6.2 |

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|--------------------------------|--|----------------------------------|
| PART - III ELECTIVE | Title : WEB TECHNOLOGY THEORY | Subject Code : 17 UMC E51 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

To develop the Students know about Web Technology Theory.

Unit I

History of the internet – Internet services and Accessibility – Uses of the internet – Protocols – Web Concepts – The client/Server model of the web – Retrieving data from the web – How the web works – Web browsers Navigation features- Searching information on the web – Internet Standards - SGML – DTD – DTD Elements - Attributes

Unit II

Head Section – Body Section – Headers – Paragraphs – Text formatting – Linking – Internet Linking – embedding Images – Lists – Tables – Frames – Other special Tags and Characters – HTML forms

Unit III

Need of a Scripting Language – identifiers – Expressions – JavaScript Keywords – Operators – Statements – functions – the Window Object - The Document Object – Forms Object – Textbox and TextArea – Button, Radio button and Checkbox – The Select Object – The Date Object – The Math Object – The String Object – Arrays.

Unit IV

Embedding VBScript code in an HTML document – Comments – Variables – Array Variables – Assignment Operator – Numerical Operators – String concatenation – Sub procedure – Function Procedure – Conditional Statements – Looping Constructs

Unit V

Introduction – Cascading style Sheets – Coding CSS – Properties of Tags – Property Values – Other Style Properties – Inline Style Sheets – Embedded Style sheets – External Style Sheets – Grouping – Inheritance – Class as Selector – ID as Selector – Contextual Selectors

Textbook(s) : Web Technology.
 Author(s) : N.P.Gopalan, J.Akilandeswari
 Publication(s) : PHI Learning Pvt. Ltd, 2011

Unit I : 1.2,1.3,1.4,1.5,1.6,1.6.1,1.6.2,1.6.3,1.6.4,1.6.5,1.7,4.2,4.2.1,4.2.2,4.2.3
 Unit II: 4.4,4.5,4.5.1,4.5.2,4.5.3,4.5.4,4.5.5,4.5.6,4.5.7,4.5.8,4.5.9,4.5.10,4.6
 Unit III: 5.1.1,5.2.1,5.2.2,5.2.3,5.2.4,5.2.5,5.2.6,5.3.1,5.3.2,5.3.3,5.3.4,5.3.5,5.3.6
 Unit IV: 5.4.1,5.4.2,5.4.3,5.4.5,6.1,6.2,6.3,6.4,6.4.1,6.5.1,6.5.2,6.5.3,6.6.1,6.6.2
 Unit V: 6.7,6.8,7.1,7.2,7.2.1,7.2.2,7.2.3,7.2.4,7.2.5,7.2.6,7.2.7,7.2.8,7.2.9,7.2.12.

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|--------------------------------|---------------------------------------|----------------------------------|
| PART - III ELECTIVE | Title : WEB TECHNOLOGY LAB | Subject Code : 17 UMC EP1 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

To develop the Students know about Web Technology Lab.

1. Write a script to add two integers.
2. Write a script that reads five integers and determines the largest integer in the group.
3. Write a script that reads integers and determines its square root using Math object.
4. Write a script to find the number of occurrences of a given number in a set of stored numbers.
5. Write a script to compare two given numbers whose inputs are from HTML form.
6. Write a script to compare two strings using string object.
7. Write a recursive function to calculate the Fibonacci value of a given number.
8. Write a script to calculate and print the area of circle using function.
9. Write a function that determines pair of integers when the second is a multiple of the first.
10. Write a script to generate random numbers within 1 to 10 and display it in a table.
11. Write a function that takes an integer value and returns the number with its digits reserved.
12. Write a script function to display current data and time using date object.
13. Write a script to validate an HTML form.
14. Write a script to count the number characters entered by a user in a text box and limit it to a particular number.
15. Write a function for distance between two (x_1, y_1) and (x_2, y_2) . Incorporate this function into a script that enables the user to enter the coordinates of the points through an HTML form.



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| | | |
|--------------------------------|-------------------------------|----------------------------------|
| PART - III ELECTIVE | Title : UNIX THEORY | Subject Code : 17 UMC E52 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

To develop the Students know about Unix Theory.

UNIT – I Evolution of the UNIX System – Some Simple Commands – Changing Your Password with *passwd* – The Shell's Use of Special Characters – Print Current or Working Directory with *pwd* – List Directory Contents with *ls* – Changing Working Directory with *cd* – Creating User Directories with *mkdir* – Copying Files with *cp* – Moving and Renaming Files with *mv* – Removing Files with *rm* – Deleting Directories with *rmdir* –

Unit II

Ownership and Protection – Printing a File – Sorting Text Files with *sort* – Counting Things In a File with *wc* – Finding Text Patterns In a File with *grep* – Translating Characters with *tr* – Printing Files In Columns using *pr* – Comparing Files with *cmp* – Finding Commonality Between Files with *comm*

Unit III

The vi Text Editor – Calling up vi – Getting out of vi – Command Structure – Basic Cursor Movements – Simple Text Additions, Changes, and Deletions – Cursor Positioning over words – Introduction to *awk* –

Unit IV

Diagram of the Shell – Some Simple Shell Procedures – Naming Shell Procedures – Shell Variables – Shell Programming – Looping with the *for* statement – Conditional Execution with *if* – The *if* statement – The *exit* statement – The *else* statement – The *elif* statement – The *test* command

Unit V

Tests on Numerical values – Tests on File Types – Tests on Character Strings – Looping with the *while* statement – Altering loop execution with *break* and *continue* – The *until* statement – The *true* and *false* commands – Selective Execution using the *case* statement – Comments in Shell Programs.

Text Book: Introducing UNIX System V by Rachel Morgan and Henry McGilton – McGraw Hill Publications.



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| | | |
|--------------------------------|-------------------------------|----------------------------------|
| PART - III ELECTIVE | Title : UNIX LAB | Subject Code : 17 UMC EP2 |
| Semester : V | HOURS : 5 hours / Week | CREDITS : 5 |

Objectives:

To develop the Students know about Unix Lab

1. Write a Shell Script for Calculating Simple Interest
2. Write a Shell Script for Swapping Two Numbers
3. Write a Shell Script for Calculating Electricity Board Bill
4. Write a Shell Script for Check the given number is non negative or not
5. Write a Shell Script for Check the given number is odd or even
6. Write a Shell Script for Generate Armstrong Numbers
7. Write a Shell Script for Generate Prime Numbers
8. Write a Shell Script for Check the given number is Adam Number or not
9. Write a Shell Script for Generating nth Multiplication Table with m range.
10. Write a Shell Script for Generating Fibonacci Sequence
11. Write a Shell Script for Finding the Reversed and Sum of digits of given.
12. Write a Shell Script for Occurrence of a Character from given words.

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VI SEMESTER

| S. No | Sub. Code | Nature | Subject Title | Hours / Week | Exam hrs | C A | SE | Tot | Crd |
|--------------|------------|-------------------|---------------------|--------------|----------|-----|----|------------|-----------|
| 1 | 17 UMC C61 | PART-III CORE | Numerical Methods | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 17 UMC C62 | PART-III CORE | Complex Analysis | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 17 UMC C63 | PART-III CORE | Operations Research | 5 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 UMC C64 | PART-III CORE | Fuzzy Sets | 5 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17UMC C65 | PART-III CORE | Statistics - II | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17UMC EV1 | PART-III ELECTIVE | Project&Viva-Voce | 5 | 3 | 40 | 60 | 100 | 5 |
| 7 | 16UGKB61 | Self Study | General Knowledge | - | - | - | - | 100 | - |
| Total | | | | 30 | | | | 700 | 25 |

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| | | |
|----------------------|----------------------------------|---------------------------------|
| PART - III | Title : NUMERICAL METHODS | Subject Code : 17 UMCC61 |
| CORE | | |
| Semester : VI | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To develop the Students know about Numerical methods.

UNIT I

Numerical Solutions of Algebraic and Transcendental Equations – Iteration Method – Newton – Method of False Positions – Solutions of Simultaneous Linear Equations – Gauss Elimination Method – Gauss's Jordan Method – Gauss Jacobi Method – Gauss Seidel Method.

UNIT II

Finite Differences- Forward Difference and Backward Differences – Finite Differences – Operators – Relations – Properties – Finding Missing Terms – Inverse Operators – Factorial Notation Interpolation and Newton's Forward and Backward Formulae.

UNIT III

Divided Differences and Properties – Newton's Divided Differences Formula – Gauss Formula Stirling's Formula – Bessel Formula – Laplace Everret's formula – Lagrange Formula – Simple Problems – Inverse Interpolation using Lagrange Formulation.

UNIT IV

Numerical Differentiation – Finding the First and Second Derivatives – Maximum and Minimum Values of a function for a given data.

UNIT V

Numerical Integration – Newton's Cote's Formula – Trapezoidal Rule – Simpson's One Third Rule – Simpson's Three Eight Rule – Weddle's Rule.

Textbook : Numerical Methods, Second Edition
Author(s) : Dr.S.Arumugam, Thangapandi Issac & Dr.A. Somasundaram
Publisher : Scitech Publications, Edition 2006.

Unit I Chapter 3 & 4 - Sections : 3.0-3.4,4.0-4.8.
Unit II Chapter 6 - Sections : 6.0-6.4,7.0&7.1.
Unit III Chapter 7 - Sections: 7.2-7.6
Unit IV Chapter 8 - Sections: 8.0-8.4
Unit V Chapter 8 - Sections : 8.5

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| | | |
|----------------------------|---------------------------------|----------------------------------|
| PART - III CORE | Title : COMPLEX ANALYSIS | Subject Code : 17 UMC C62 |
| Semester : VI | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To develop the Students know about Complex Analysis.

UNIT I

Analytic Functions – C~R Equations - Sufficient Conditions - Harmonic Functions.

UNIT II

Elementary Transformations - Bilinear Transformations - Cross Ratio - Fixed Points - Special Bilinear Transformations - Real Axis to Axis - Unit Circle to Unit Circle and Real Axis to Unit Circle only.

UNIT III

Definite Integral - Cauchy's Fundamental Theorem - Cauchy's Integral Formulae and Formulae for Derivatives - Morera's Theorem - Cauchy's Inequality - Liouville's Theorem - Fundamental Theorem of Algebra.

UNIT IV

Taylor's Theorem, Laurent's Theorem - Singular Points – Poles - Argument Principle - Rouché's Theorem.

UNIT V

Calculus of Residues - Evaluation of Definite Integrals

Text Book(s) : Complex Analysis
Author(s) : Dr. S.Arumugam, A.Thangapandi Issac, Dr. A. Somasundaram
Publication(s) : Scitech Publications.

Reference Book(s) :

| | | |
|----------|-----------|--------------------|
| Unit I | Chapter 2 | Sections: 2.0-2.8 |
| Unit II | Chapter 3 | Sections: 3.1-3.5 |
| Unit III | Chapter 6 | Sections: 6.1-6.4 |
| Unit IV | Chapter 7 | Sections: 7.1-7.4 |
| Unit V | Chapter 8 | Sections : 8.1-8.3 |

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|----------------------------|--|---------------------------------|
| PART - III CORE | Title : OPERATIONS RESEARCH | Subject Code : 17 UMCC63 |
| Semester : VI | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To develop the Students know about Operations Research.

UNIT I : LINEAR PROGRAMMING PROBLEM

Introduction – Mathematical formulation of the problem – Graphical solution method – Some exceptional cases – General LPP – Canonical and Standard forms of LPP.

UNIT II: LINEAR PROGRAMMING PROBLEM

Introduction of simplex method – Fundamental properties of solutions – The computational procedure – Two phase method, Big M method – Solution of simultaneous linear equations – General primal dual pair – Primal dual pair in matrix form – Duality and simplex method - Dual simplex method.(omit Theorems)

UNIT III: TRANSPORTATION PROBLEM

General transportation problem – The transportation table – Duality in transportation problem – Loops in Transportation tables – LP formulation of the Transportation problem – Solution of a Transportation problem – Finding an initial basic feasible solution – Test for optimality – Degeneracy in transportation problem – Transportation algorithm (MODI METHOD) – Stepping stone solution method – Some exponential cases – Time minimization transportation problem – Transshipment problems.

UNIT IV: ASSIGNMENT PROBLEM

Introduction – Mathematical formulation of the problem – The assignment method – Special cases in assignment problems – A typical assignment problem – The travelling salesman problem.

UNIT V: GAMES AND STRATEGIES

Introduction – Two-person zero-sum games – Some basic terms – The maxmin-minimax principle – Games without saddle points-mixed strategies – Graphical solution of $2 \times n$ and $m \times 2$ games – Dominance property – Arithmetic method for $n \times n$ games – General solution of $m \times n$ rectangular games- Game against passivity – Limitations and Extensions.

TEXT : OPERATIONS RESEARCH by Kanti Swarup, P.K.Gupta, Man Mohan Sultan Chand & Sons Publications, IX Edition,

| | | |
|----------|-------------|-------------------------|
| Unit I | Chapter 2,3 | Pages: 2.1,2.2,3.2-3.5. |
| Unit II | Chapter 4,5 | Pages: 4.1-5.9 |
| Unit III | Chapter 10 | Pages: 10.2-10.15 |
| Unit IV | Chapter 11 | Pages: 11.1-11.6 |
| Unit V | Chapter 17 | Pages: 17.1-17.9. |



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|----------------------------|------------------------------|---------------------------------|
| PART - III CORE | Title : FUZZY SETS | Subject Code : 17 UMCC64 |
| Semester : VI | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To develop the Students know about Fuzzy Sets.

Unit I Fuzzy Set Theory.

Introduction – Number system – Interval – Sets – representations – Types of sets – Subsets – Universal sets – Operation on sets – Difference of two sets – Results – Venn diagram – Solved examples.

Unit II Fuzzy Set Theory.

Fuzzy Sets – Definitions – Types of fuzzy sets – Properties of fuzzy sets – Important operations – Fuzzy vs crisp – Solved Problems.

Unit III Operations on Fuzzy Sets.

Introduction – Important theorems – Extension principle of fuzzy sets – Fuzzy compliment – Further operations on fuzzy sets.

Unit IV Fuzzy Numbers And Arithmetic.

Definitions – Fuzzy arithmetic – Arithmetic operations of fuzzy number in the of--- cut sets – Fuzzy equations – Solved problems.

Unit V Fuzzy Relations.

General definitions – Projections and cylindrical fuzzy relations n- Composition – Relational join – Binary relations on single set – Compatibility relation – Solved problems.

Text Book: Fuzzy Sets & their applications, Pragati Edition by Dr.Sudhir Pundir, Dr. Rimple Pundir, first edition, 2006.

| | | |
|----------|-----------|--------------------------------------|
| Unit I | Chapter 1 | Sections: 1.1-1.15 |
| Unit II | Chapter 1 | Sections: 1.16-1.21 |
| Unit III | Chapter 2 | Sections: 2.1-2.5 |
| Unit IV | Chapter 3 | Sections: 3.1-3.8,3.9 (omit theorem) |
| Unit V | Chapter 4 | Sections: 94 – 110 |

Passed in the BOS Meeting
held on 15-3-17

Signature of Chairman/HOD



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B.Sc., MATHEMATICS (COMPUTER APPLICATION)
SYLLABUS
 (Under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|----------------------------|-------------------------------|----------------------------------|
| PART - III CORE | Title : STATISTICS- II | Subject Code : 17 UMC C65 |
| Semester : VI | HOURS : 5 hours /week | CREDITS : 4 |

Objectives:

To develop the Students know about Statistical methods.

UNIT I

CORRELATIONS & REGRESSION: Introduction – Correlation simple problems – Rank correlation – Regression – Simple problems.

UNIT II

PROBABILITY: Introduction – Conditional probability – Properties of independent events – Bayee’s theorem – Boole’s inequalities.

UNIT III

RANDOM VARIABLES: Introduction – Discrete Random Variable & Continuous Random Variable – Mathematical expectations – Moment generating function – Properties of Moment – Cumulant – Properties of generating function.

UNIT IV

SPECIAL DISTRIBUTIONS: Binomial distribution – Moments of binomial distribution – Mode of binomial distribution – Poisson distribution – Mode of passion distribution – Fitting Poisson distribution.

UNIT V

NORMAL DISTRIBUTION: Definition – MGF of normal distribution – Mode of normal distribution – β and γ co-efficient of normal distribution – Simple problems.

TEXT BOOK: STATISTICS

AUTHOUR: ARUMUGAM & ISSAC.

PUBLISHER: New Gamma Pub. House June 2007

Reference Book: Statistical methods by S.P.Gupta.

| UNIT | CHAPTER | SECTIONS |
|-------------|----------------|-----------------|
| I | 6 | 6.0-6.3 |
| II | 11 | 11.0-11.2 |
| III | 12 | 12.0-12.5 |
| IV | 13 | 13.1-13.2 |
| V | 13 | 13.3only |

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| | | |
|--------------------------------|---|----------------------------------|
| PART - III ELECTIVE | Title : PROJECT WORK & VIVA-VOCE | Subject Code : 17 UMC EV1 |
| Semester : VI | HOURS : 5 hours /week | CREDITS : 5 |

Objectives:

- To give exposure on software development and maintenance
 - To train students, a systematic way of Report writing
 - To practice students for project presentation
1. A maximum of two students can join to do the project work
 2. Students must undertake the project work under the guidance of a faculty member
 3. Progressive reports have to be submitted to the guide periodically
 4. The internal test marks is 40 and is divided into the following components.
 - (i) Two Presentations - $2 \times 10 = 20$ marks
 - (ii) Progressive Reports - 10 marks
 - (iii) Internal Viva-voce - 10 marks
 5. The external examination will be jointly conducted by both the Internal and external examiners
 6. The students must submit 3 copies (2 copies for 2 students + 1 copy for the Dept.) of their Project Report two weeks before the external examination.
 7. The maximum marks for the external examination is 60 and it may be divided into the following components.
 - (i) Project Report - 20 marks
 - (ii) Project Presentation - 20 marks
 - (iii) Project viva-voce - 20 marks

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I SEMESTER

| S. No | Sub. Code | Subject Title | Hours / Week | Duration of exams | CA | SE | Tot | Credits |
|-------|-----------|---------------------------------|--------------|-------------------|----|----|-----|---------|
| 1 | 17MBAC11 | Management Theory and Practice | 5 | 3 | 25 | 75 | 100 | 4 |
| 2 | 17MBAC12 | Organizational Behaviour | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 17MBAC13 | Managerial Economics | 6 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17MBAC14 | Management Accounting | 6 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17MBAC15 | Quantitative Techniques - I | 6 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17MBAWS1 | Workshop on Managerial Skills I | 2 | | | 50 | 50 | 1 |
| 7 | 17MBACV1 | Comprehensive Viva Voce | | | | 50 | 50 | 1 |
| | | Total | 30 | | | | | 22 |

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held on 15-3-2017

Signature of Chairman / HOD



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MASTER OF BUSINESS ADMINISTRATION (M.B.A)
(Syllabus under CBCS w.e.f. 2017 – 2018 onwards)

| | | |
|----------------------------|--|--------------------------------------|
| PART - III CORE | Title : MANAGEMENT THEORY AND PRACTICES | Subject Code : 17 MBA C11 |
| Semester : I | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To expose the students on Fundamentals on Management
- To make them understand various Functions of Management

Unit 1:- Management: Introduction, Meaning, Definition, Nature, characteristic and functions of management, Evolution or History of Management (Classical, Neo-classical And Modern Theory). Modern Management practices in the era of Globalization.

Unit 2:- Planning: Meaning, Objective, Definition, characteristics, Importance, Advantages of Planning, Planning Premises, Steps in Planning Process, Methods of planning, Objectives, MBO- Introduction, Definition, Features, Advantages, Decision making-Definition, Decision making process.

Unit 3: Organizing: Meaning, Definition, Functions, Nature or characteristics of Organizing, Classification of organization (Formal & Informal), Line / Staff Authority, Decentralization.

Unit 4:- Staffing: Definition, Element Functions, Process, HRP, Recruitment- Definition, Sources of Recruitment, Selection-Importance, Stages, Performance Appraisal- Meaning, Definition, Importance, Types of Performance Appraisal.

Unit 5:- Directing & Controlling: Introduction, Definition, Principles, Techniques, Motivation, (Introduction, Theories, Types), Leadership- Introduction, Definition, Approaches of Theories of Leadership, **Controlling:** Introduction, Definition, Steps, Techniques of Controlling.

Text Book:

1. Principles of Management – T. Ramasamy Himalaya Publishing House
2. Principles and practice of Management - L.M. Prasad Sultan chan and sons Publications

Recommended Text Books:

- 1) Management A Global Perspective -Heinz Wehrich McGraw Hill
Harold Koontz
- 2) Essentials of Management -Harlod Koontz Cyrill O' Donnell McGraw
Hill & Heinz weighrich

Chapter and Sections:

- Unit I - Principles of Management – T. Ramasamy Himalaya Publishing House
- Unit II - Principles and practice of Management - L.M. Prasad Sultan chan and sons Publications
- Unit III - Principles of Management – T. Ramasamy Himalaya Publishing House
- Unit IV -Principles and practice of Management - L.M. Prasad Sultan chan and sons Publications
- Unit V - Principles and practice of Management - L.M. Prasad Sultan chan and sons Publications



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|----------------------------|---|----------------------------------|
| PART - III CORE | Title : ORGANISATIONAL BEHAVIOUR | Subject Code : 17 MBA C12 |
| Semester : I | HOURS : 5 hours / Week | CREDITS : 4 |

Objective:

- To introduce behavior of people at work
- To make them understand basics of OB

Unit 1:- Definition, various approaches to Organisational Behaviour, Hawthorne Studies, its major findings and limitations, Relevance in current day context. Historical and Scientific foundations of Organisational Behaviour- Globalization: of Business Managing Diversity and Promoting Ethical Behaviour.

Unit 2:- A. Foundations of Organisational Behaviour: Perception, Learning and Personality - Concepts, theories, Models, Inter-relationships between these topics.

Unit 3:-

Values, Attitudes, Job satisfaction - Motivation: Concepts, theories, Models, Foundations of Group Behaviour: Group Dynamics, Leadership, Communication and Decision making,

Unit 4:- Leadership, Power and Politics, Conflicts, Negotiations. Work Stress- Concepts, Theories, Models, Applications.

Unit 5:- Organisational Dynamics: Change and Organisational Development, Organisational Culture, Human Resource Policies and Practices.

Text Books:

- | | | |
|--|-------------------|---------------------------|
| 1. Organisational Behaviour (Latest Edition) | Fred Luthans | McGraw Hill |
| 2. Organisational Behaviour Concepts, Controversies, applications | Stephen P Robbins | Prentice Hall of India |
| 3. Organisational Behaviour | K. Aswathappa | Himalaya Publications |

Chapters & sections

- | | | |
|------------|---|-------------------|
| Unit I - | Organisational Behaviour (Latest Edition) | Fred Luthans |
| Unit II - | Organisational Behaviour (Latest Edition) | Fred Luthans |
| Unit III - | Organisational Behaviour Concepts, Controversies, applications | Stephen P Robbins |
| Unit IV- | Organisational Behaviour Concepts, Controversies, applications | Stephen P Robbins |
| Unit V: | Organisational Behaviour | K. Aswathappa |



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|----------------------------|---|----------------------------------|
| PART - III CORE | Title : MANAGERIAL ECONOMICS | Subject Code : 17 MBA C13 |
| Semester : I | HOURS : 6 hours / Week | CREDITS : 4 |

Objective:

- To make the students understand the Economic Concepts and Tools that aids the managers for decision making in different business situations.
- To expose them in Macroeconomic Environment.

Unit 1:

Introduction to Managerial Economics: Definition, Nature and Scope of Managerial Economics. Interdisciplinary approach to Managerial Economics, Circular flow of economic activity. Economics and Decision Making.

Demand Theory and Analysis:

Law of Demand. Demand Determinants. Individual and Market Demand Schedule.

Elasticity of Demand Price Income, Cross Elasticities, Demand Forecasting - Objectives- Demand Forecasting types - Established product - New Product - Qualities of a good demand Forecasting.

Unit 2:-

Production Costs: Basic concepts in Production Theory :Production with one variable input, two variable inputs. Economies of Scale - uses of Isoquants, Isocost curves for optimal combinations of inputs. Relationship between short run and long run costs.

Unit 3:-

Market Structure:

A. Perfect Competition: Features - short term equilibrium - long term equilibrium

B. Monopoly: Monopoly - Causes. Powers of Monopolist. Prices and Output Determinations in Monopoly Market.

C. Monopolistic Competition : Monopolistic Competition Characteristics: Prices and outputs determination in the Monopolistic Competition - Excess Capacity in Monopolistic Market.

D. Oligopoly: Characteristics, Price rigidity (The Kinked Demand Model), Interdependence, Cartel and Collusive Price leadership, Non Cooperative oligopoly, Strategic interaction in oligopoly markets.

Unit 4:-

Pricing : Meaning - Objectives of Pricing Policy - Pricing Strategies.



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Unit 5:-

Macro economics: Monetary, Fiscal Policy. Aggregate demand - Accelerator and multiplier Effects- Globalisation and its Impact on Indian Business Enterprises.

Text Books:

- | | | | |
|----|----------------------|---|---------------------------|
| 1) | Managerial Economics | Dr. S. Sankaran | Margham Publications |
| 2) | Managerial Economics | R L Varshney & K L Maheshwari | Sultan Chand & Sons |
| 3) | Managerial Economics | R. Cauvery, Dr. M Girija Dr. R. Meenakshi & Dr. U K Sudha Nayak | S. Chand |
| 4) | Managerial Economics | D. Gopalakrishna | Himalaya Publishing House |

Reference Books

- | | | | |
|----|---------------------------|--|------------------------|
| 1) | Managerial Economics | Joel Dean | Prentice Hall of India |
| 2) | Managerial Economics (3c) | H. Craig Peterson & W. Cris Lewis | Prentice Hall of India |
| 3) | Managerial Economics (se) | Maurice / Shornad | Irwin |
| 4) | Economics (15e) | Paul A Samuelson & William D Nordhaus | McGrawHill |
| 5) | Managerial Economics | Maurice Thomas | |

Chapters and Sections:

- | | | |
|------------|----------------------|---|
| For Unit I | Managerial Economics | Dr. S. Sankaran |
| Unit II | Managerial Economics | R L Varshnery & K L Maheshwari |
| Unit III | Managerial Economics | R. Cauvery, Dr. M Girija, Dr. R. Meenakshi & Dr. U K Sudha Nayak |
| Unit IV | Managerial Economics | Dr. S. Sankaran |
| Unit V | Managerial Economics | R L Varshnery & K L Maheshwari |



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|----------------------------|--|----------------------------------|
| PART - III CORE | Title : MANAGEMENT ACCOUNTING | Subject Code : 17 MBA C14 |
| Semester : I | HOURS : 6 hours / Week | CREDITS : 4 |

Objective:

- **The Main objectives is to make the student understand basic principles of Financial Accounting and Cost Accounting**
- **To make them learn how to apply the principles in Decision Making**

Unit 1:- Introduction to Financial Accounting:

Definitions of financial, cost and Management Accounting - Differences between cost and Management Accounting, financial Accounting and Management Accounting.. Functions and qualities of a Management Accountant - Financial Statements: Accounting Principles and Concepts - Preparation of Journals, Ledger, Trail Balance, Trading Account, Profit and Loss Account and Balance Sheet(with Adjustments).

Unit 2:- Fundamental of Cost Accounting:

Introduction to costing - Element of Cost - Different types of costing – Classification of cost.

Cost Volume Profit Analysis: Profit volume ratio, Break Even Point - Plotting of BEP charts and Margin of safety..

Marginal Costing and its Applications:

Decision making situations

Make / Buy / Subcontract, Sell / Process further, Pricing of product / Service, Adding / Dropping of product, Product lines, Closing down of divisions, changing product mix.

Unit 3:- Budgeting Profit Planning and Control:

Budgeting – Meaning Objectives of Budgetary Control – Classification of Budgets – Preparation of Flexible Budgets, Cash Budget, Production Budget, Sales Budget, and Overheads Budget.

Unit 4:-

Standard Costing and Variance Analysis: Comparison between budgeting and Standard Costing, Material Variances: Cost, price, usage, mix and Yield Variances. Labour Variances: Cost, Rate, Efficiency, mix and Yield Variances

Unit 5:-

Management Reporting System:

Management Reporting – Purpose of Reports - Steps in Preparation of a Management report - Qualities of a good management Report.



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Text Books:

1. Management Accounting Dr.N.P.Srinivasan and Dr.M.Sakthivel Murugan
(60% Problems and 40% Theory)

Suggested Reading:

1. Management Accounting R S N Pillai & Bagawathi
2. Management Accounting S N Maheshwari
3. Cost Accounting - Practice and Theory S P Jain and Narang
4. Cost Accounting -Problems and Solution Jain and Narang

Chapters and Sections:

1. For Unit I, II & III Management Accounting Dr.N.P.Srinivasan and
Dr.M.Sakthivel Murugan
2. Unit IV Management Accounting R S N Pillai & Bagawathi
3. Unit V Management Accounting R S N Pillai & Bagawathi



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|----------------------------|--|----------------------------------|
| PART - III CORE | Title : QUANTITATIVE TECHNIQUES - I | Subject Code : 17 MBA C15 |
| Semester : I | HOURS : 6 hours / Week | CREDITS : 4 |

(80% Problems and 20% Theory)

Objectives:

- To impart students about the knowledge of basic statistical tools and techniques.
- To emphasis its application in Business Decision Process and Management.

Unit1:- Introduction to Mathematics: Sets, Permutation and Combination. Matrices and Determinants - Solution of Simultaneous equation, crammer’s Rule, Adjoint of a square matrix, Inverse of a square matrix

Unit2:- Measures of Central Tendency: Meanings, Objectives, Arithmetic Mean, Weighted Mean, Median, Mode Different Formulas, Comparison. , limitations

Unit3:- Measures of Central Dispersion: Range, quartile deviation, Mean deviation, Standard Deviation, Co-efficient of variation.

Unit 4:- Index Numbers: Definition, Un weighted Aggregates, Index weighted, Aggregate Index, Quantity and value Indices.

Unit 5:- Time Series Analysis: Introduction, Variations, Time Series, Trend Analysis, Cyclical Variation, Seasonal variation- methods of least square

Text Books:

- | | | |
|------------------------|------------------------|------------------------|
| 1. Statistical Methods | S.P.Gupta | S.Chand Publication |
| 2. Statistics for Mgt. | Richard I Levin, Rubin | Prentice Hall of India |

Reference Books:

- | | |
|------------------------------|---------------------------|
| 1) Statistical Methods | Dr Wilson |
| 2) Business Mathematics | Sunderasan and Jayaseelan |
| 3) Statistics for Management | J.K.Sharma |

Chapter and Sections:

| | | |
|--------------------------------|------------------------|------------------------|
| Unit I - Statistical Methods | S.P.Gupta | S.Chand Publication |
| Unit II - Statistics for Mgt. | Richard I Levin, Rubin | Prentice Hall of India |
| Unit III - Statistical Methods | S.P.Gupta | S.Chand Publication |
| Unit IV – Statistics for Mgt. | Richard I Levin, Rubin | Prentice Hall of India |
| Unit V - Statistical Methods | S.P.Gupta | S.Chand Publication |



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|----------------------------|--|----------------------------------|
| PART - III CORE | Title : WORKSHOP ON MANAGERIAL SKILLS - I | Subject Code : 17 MBA WS1 |
| Semester : I | HOURS : 2 | CREDITS : 1 |

OBJECTIVE:

- It is essentials for a student in Management Studies to know the Strengths and weakness of the members in the team.
- The aim of this syllabus is to make the student understand Group Dynamics and Its importance.

UNIT I - KNOW THYSELF: Success Formula ASK – Importance of knowing yourself – Process of Knowing Yourself - SWOT Analysis – Benefits – Using SWOT Analysis – SWOT Analysis Grid – Questions to complete grid - USP – Multiple Intelligences.

UNIT II - GOAL SETTING: What are Goals – Important of Goal Setting - Types of Goals - Steps of Goal Setting – SMART Principles.

UNIT III - ETIQUETTES: Dressing - Modes Of Greeting – Introducing, Requesting, Congratulating, Inviting, Thanking, Giving Opinion, Advice, Orders, Suggestions, Permission – Apology – Expression Of Agreement – Disagreement.

UNIT IV - NEGOTIATING SKILLS: Fundamental principles of Negotiations - Developing Negotiations package - Inter-Intra group Negotiations - Non-verbal cues in Negotiation - Styles of Negotiations - International Negotiations and ethics.

UNIT V - PUBLIC SPEAKING: Definition, objective and fears associated - Tips to start with confidence - Giving your first speech - Speech on topic of your choice.

Text Books / References:

- | | | |
|-------------------------------|-----------------|------------------------|
| 1. Communicating at work | Adier | McGraw Hill Publisher |
| 2. Successful Negotiators - | S L Rao | Wheeler Publishing |
| 3. The Essence of Negotiation | Team M, Hiltrop | Prentice Hall of India |
| 4. Public Speaking | Osborn & Osborn | AITBS Publishers |
| 5. Soft Skills | Dr.Alex | S.Chand Publishers |

CHAPTERS AND SECTIONS

UNIT I: Soft Skills, Dr.Alex, S.Chand Publishers.

UNIT II: Soft skills, Department of Business Administration, Sourashtra College Publication.

UNIT III: Soft Skills, Dr.Alex, S.Chand Publishers.

UNIT IV: The Essence of Negotiation Team, M, Hiltrop, Prentice Hall of India
 Successful Negotiators, S L Rao, Wheeler Publishing.

UNIT V: Public Speaking , Osborn & Osborn, AITBS Publishers



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II SEMESTER

| S. No | Sub. Code | Subject Title | Hours / Week | Duration of exams | CA | SE | Tot | Credits |
|-------|-----------|----------------------------------|--------------|-------------------|----|----|-----|---------|
| 1 | 17MBAC21 | Quantitative Techniques - II | 6 | 3 | 25 | 75 | 100 | 4 |
| 2 | 17MBAC22 | Marketing Management | 5 | 3 | 25 | 75 | 100 | 4 |
| 3 | 17MBAC23 | Financial Management | 6 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17MBAC24 | Operations Management | 6 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17MBAC25 | Human Resource Management | 5 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17MBAWS2 | Workshop on Managerial Skills II | 2 | | | 50 | 50 | 1 |
| 7 | 17MBACV2 | Viva Voce | | | | 50 | 50 | 1 |
| | | Total | 30 | | | | | 22 |

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Signature of Chairman / HOD



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|----------------------------|---|----------------------------------|
| PART - III CORE | Title : QUANTITATIVE TECHNIQUES II | Subject Code : 17 MBA C21 |
| Semester : II | HOURS : 6 hours / Week | CREDITS : 4 |

(80% Problems and 20% Theory)

Objectives:

- To make the students familiar with statistical Tools and Techniques.
- To Apply in Managerial Decision Making in key areas.

Unit1: Correlation: Simple, Karl Pearson's, Coefficient of correlation and Rank-Correlation-Regression- Simple, Difference between Correlation and Regression.

Unit2: Probability Applications in Management: Basic concepts, Addition Theorem, Multiplication Theorem and Baye's Theorem

Theoretical Distributions: Binomial, Poison, Normal distributions.

Unit 3: Estimation Theory and Hypothesis Testing – Standard Error – Errors in Hypothesis testing.

Significance test in attributes: - Testing Difference in numbers- Testing Difference in proportions.

Unit 4: Significance test in Variables (Large Samples) –Significance tests –

Significance test in Variables (Small Samples) – t Test for Difference of Means – Significance test for Dependent Samples or Paired Observations

Unit 5: Chi – Square test –Test for Goodness of Fit – Test for Independence of Attributes – **Analysis of variance** – Analysis in One way Classification – Analysis of variance in two way Classification.

Text Books:

1. Fundamentals of Statistics DN Elhance KITAB Mahal, Allahabad.
2. Statistical Methods S.P.Gupta S.Chand Publication

Reference Books:

1. Statistical Methods Dr Wilson
2. Business Mathematics Sunderasan and Jayaseelan
3. Business Statistics Dr.A.K.Gupta

Chapter and Sections:

| | | |
|---------------------------------------|------------|-------------------------|
| Unit I - Fundamentals of Statistics | DN Elhance | KITAB Mahal, Allahabad. |
| Unit II - Fundamentals of Statistics | DN Elhance | KITAB Mahal, Allahabad. |
| Unit III - Fundamentals of Statistics | DN Elhance | KITAB Mahal, Allahabad. |
| Unit IV – Statistical Methods | S.P.Gupta | S.Chand Publication |
| Unit V - Fundamentals of Statistics | DN Elhance | KITAB Mahal, Allahabad. |

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| | | |
|----------------------------|---|----------------------------------|
| PART - III CORE | Title : MARKETING MANAGEMENT | Subject Code : 17 MBA C22 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To introduce the fundamental concepts and theories in the area of marketing and assist the student in marketing decision making.
- The syllabus will enlighten the students in the current issues in Global Marketing

Unit 1 :- Introduction : Marketing Management - Nature - Scope - Marketing Management Today - The Marketing Environment - The Customer, The Competition

Unit 2:- Assembling the Marketing Toolbox: Marketing Planning - Marketing Research and Information Systems - Consumer Behaviour - Organisational Buying Behaviour - Segmenting and Targeting - Market Metrics and Demand Forecasting

Unit 3:- Delivering Customer Value: Product Management - New Product Decisions - Brand Decisions - Pricing Decisions - Integrated Marketing Communications - Advertising Management - Sales Promotion - Personal Selling - Managing the Sales Force - Managing the Distribution Function - Retail Management - Direct Marketing

Unit 4:- Creating Sustainable Competitive Advantage: Marketing Strategy - Customer Relationship Management - Marketing Organisation - Marketing Performance and Control

Unit 5:- Current Issues: Global Marketing - Customer Service - Service Marketing - Rural Marketing - Green Marketing.

Text Books:

1. Marketing Management - Rajan Saxena TMH Education Pvt Ltd, New Delhi

Chapters and Sections:

| | | |
|------------|----------------------|--------------|
| For Unit I | Marketing Management | Rajan Saxena |
| Unit II | Marketing Management | Rajan Saxena |
| Unit III | Marketing Management | Rajan Saxena |
| Unit IV | Marketing Management | Rajan Saxena |
| Unit V | Marketing Management | Rajan Saxena |

Reference Books

1. Fundamentals of Marketing - Edward W Cundiff Richard R Still & Norman A P Govoni
2. Principles of Marketing - Philip Kotler and Gary Amstrong PHI 7th Edition
3. Marketing Management Planning - V S Ramasamy and S Namakumari
4. Marketing Management - Philip Kotler 12 ed PHI

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|----------------------------|---|----------------------------------|
| PART - III CORE | Title : FINANCIAL MANAGEMENT | Subject Code : 17 MBA C23 |
| Semester : II | HOURS : 6 hours / Week | CREDITS : 4 |

Objective:

- To provide a thorough understanding of concepts and theories and develop the skills to understand, analyze and interpret financial data and problems.
- Also to teach how to apply Financial Management to make better financial decisions.

Unit 1:- Introduction to Finance - Scope – Objectives - Finance Function – Financial Managers role - Profit maximization Vs Wealth maximization - Management accounting and Financial management.

Unit 2:- Financial Statements – Analysis and Interpretation of Financial Statements - Financial Ratio Analysis - Common size statements, Trend analysis, and comparative statement analysis - funds flow analysis and cash flow analysis.

Unit 3:- Capital Structure – Elements – NOI Approach – MM Hypothesis With Corporate and Without Taxes –The Trade of theory - Cost of capital - Equity, Preference, Debt, Retained earnings and other modes of finance - EBIT and EPS analysis - Debt- Financing and -Venture capital – Leverage.

Unit 4:- Investment decisions – Importance – Types - Evaluation - Discounting and Non-discounting Techniques - Capital Asset Pricing Model (CAPM).

Unit 5:- Working Capital Management – Characteristics -Types of Working capital – Determinants of Working Capital - Liquidity and its determinants – implications. EOQ model - Management of Receivables- Financing of current assets - Bank borrowing.

Text Book:

1. Financial Management - I M Pandey – 10th Edition – Vikas Publications

Chapters and Sections:

Unit I, II, III - Financial Management - I M Pandey

Unit IV, V- Financial Management - P. Periasamy

Reference Books:

1. Financial Management - P. Periasamy – 2nd Edition – Tata Mc Graw Hill
2. Financial Management Theory and Practice – Prasanna Chandra - – Tata Mc Graw Hill



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|----------------------------|--|----------------------------------|
| PART - III CORE | Title : OPERATIONS MANAGEMENT | Subject Code : 17 MBA C24 |
| Semester : II | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To impart the knowledge Operations Management in the context of changing business environment.
- To expose the different factors considered for taking decisions regarding Production
- To experience various techniques adopted at different levels of Production Management of an organization

Unit – I

Introduction to Operations Management – Model - Historical Background of Operations Management – Role of Operations Management in strategic Management – Types of Productive Systems - Forecasting - Use of forecasting- Forecasting vs Prediction - Methods of Forecasting.

Unit - II

Product Design and Development – Influencing factors, Approaches, Legal, Ethical and Environmental issues

Process Planning - Selection, Strategy, Major Decisions - Factors considered – Methods – Linkage to the Product Life Cycle.

Capacity Planning – Factors considered – Types – Capacity Requirement Planning

Facility/Plant Locational Decision – Factors considered – Recent Trends in location of Industries.

Plant Layout – Objectives, Types, Factors Affecting the Plant Layout Decision, Techniques for selection of Location..

Unit – III

Aggregate production planning – Approaches - Material Requirement planning (MRP) – Supply Chain Management – Decisions – Process – Models - Job shop Production

Unit - IV

Inventory Management – Objectives, Costs and Control techniques – EOQ Models - Overview of MRP, MRP II and ERP - Overview of JIT. Materials Management – Objectives – Importance.

Unit - V

Project Management – Scheduling Techniques, PERT, CPM, - Simple Problems – TQM Factors Affecting Quality – Lean – Six Sigma.



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Text Books

1. Production and Operations Management - Upendra Kacharu – Excel Books
2. Production and Operations Management - R.PanneerSelvam – PHILearning Private Limited
3. Production and Operations Management - K. Aswathappa K.Sridhara Bhatt Himalaya Publishing House.

Chapters and Sections:

- Unit I,IV - Production and Operations Management - Upendra Kacharu
Unit II,III - Production and Operations Management - K. Aswathappa K.Sridhara
Unit V- Production and Operations Management - K. Aswathappa K.Sridhara Bhatt

Reference Books:

1. Production and Operations Management – Martinich –Wiley
2. Production and Operations Management – S N Chary – Tata MC Graw Hill
3. Production and Operations Management – Khanna Prentice Hall India
4. Production Management – S A Chunawalla



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| PART - III CORE | Title : HUMAN RESOURCE MANAGEMENT | Subject Code : 17 MBA C25 |
| Semester : II | HOURS : 5 hours / Week | CREDITS : 4 |

Objective:

- To make the students to understand the importance of Human Resource and how best it can be utilized for the achievement of the Individual and Intuition development
- To provide an in depth understanding on the subject covering all the recent developments like entry of MNC's, strategic orientation and to highlight the changing of Human Resource Management.

Unit 1:- Introduction Definitions, History of HRM, Overview of HRM, HR Activities & Objectives, Functions, Policies, Importance & Approaches, Benefits & Barriers Current and Future challenges to HRM: Job and careers in HRM - Strategic HRM – Introduction, Concept and implication, Trends & Influence of HRM

Unit 2:- Human resource planning: **Definition, Purpose, Steps, Forecasting HR Demand** , Models for HRP. Job Analysis: Definition, scope and methods of job analysis, Strategic view and valuation –

Unit 3:- Recruitment and Selection and Performance Appraisal, Learning and Development and Employee Compensation

Unit 4:- Grievance Handling and Discipline- models, Grievance procedure, Need and concept of discipline - Standing orders - procedure / process of conducting domestic enquiry - Natural justice. Computers in HRM: Introduction to HRIS, acquiring and implementing HRIS, computer and HRIS uses in HRM

Unit 5: Industrial Relations: Objectives, Approaches of HR, Trade Unions: Definition, features & Objectives, Functions, collective Bargaining

1. The Factories Act.
2. ESI Act.
3. Provident Fund Act.
4. Gratuity Act.
5. Bonus Act.

Text Books:

1. Personnel Management - Edwin B Flippo
2. Human Resource Management - K. Aswathappa
3. Human Resource Management - Subba Rao
4. Human Resource Management - C.B. Mamoria

Chapters and Sections:

1. Unit I,II - Human Resource Management - K. Aswathappa
 Unit III, IV - Human Resource Management - Subba Rao
 Unit V- Human Resource Management - Vikas Arora, Seema Arora



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| PART - III CORE | Title : WORKSHOP ON MANAGERIAL SKILLS - II | Subject Code : 17 MBA WS2 |
| Semester : II | HOURS : 2 | CREDITS : 1 |

Objective:

- It is essential for a student in Management Studies to know the Strengths and weakness of the members in the team.
- The aim of this syllabus is to make the student understand Group Dynamics and Its importance.

Unit 1:-Time Management: Introduction – The 80:20 rule- Three Secrets of Time Management- Time management Matrix – Analysis of Time management matrix – Time wasters – Time savers – Time circle planner – Tips.

Unit II:- Team Building: Introduction – Meaning – Aspects of team building- Skills needed for team work – A model for team building – Team Vs Group – Characteristics for effective teams. – Tips.

Unit III: - Leadership: Introduction – Meaning of Leader – Roles - Qualities – How to become a Leader – Essential Leadership qualities - Tips.

UNIT IV:-Emotional Intelligence: Introduction – Meaning - What are Emotions - The Five Dimensions – Tips.

UNIT V: Effective Decision Making: Introduction – Why Decision is important – Importance of Decision Making - Types of Decision –Process of Decision Making - D A S S A E - 5 W + 1 H – Tips.

TEXT BOOKS:

1. D.K.Singh, Just in time, Ane Books Pvt Ltd, 2009.
2. Glenn M parker, Richard P Kroop – Team Building, Viva Books Pvt Ltd.
3. Len Speery, Effective Leadership, Brunner – Rouledge, Newyork.
4. Daniel Goleman, Emotional Intelligence, Bantam books.
5. Dena Michelli, E, Decision Making, Hodder & Stoughton.
6. Dr.Alex, Soft Skils, S.Chand Publishers.

CHAPTERS AND SECTIONS:

UNIT I: Dr.Alex, Soft Skils, S.Chand Publishers.

UNIT II: Dr.Alex, Soft Skils, S.Chand Publishers

UNIT III: Len Speery, Effective Leadership, Brunner – Rouledge, Newyork.

UNIT IV: Daniel Goleman, Emotional Intelligence, Bantam books.

UNIT V: Dena Michelli, E, Decision Making, Hodder & Stoughton.



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III SEMESTER

| S. No | Sub. Code | Subject Title | Hrs / Week | Exam hrs | CA | SE | Tot | Crd |
|----------|----------------------------|--|------------|----------|----|-----|-----|-----|
| 1. | 17MBAC31 | Operations Research | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MBAC32 | Business Environment and Law | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | 17MBAC33 | Business Research Methods | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. & 5.* | | MARKETING ELECTIVES | | | | | | |
| | 17MBAE3A | i) Personal Selling and Sales Management* | 4 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE3B | ii) Services Marketing* | 4 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE3C | iii) Advertising and Sales Promotion* | 4 | 3 | 25 | 75 | 100 | 4 |
| | | FINANCE ELECTIVE | | | | | | |
| | 17MBAE3D | i) Indian Capital Markets* | 4 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE3E | ii) International Trade Finance and Documentation* | 4 | 3 | 25 | 75 | 100 | 4 |
| | | HUMAN RESOURCES | | | | | | |
| | 17MBAE3F | Training and Development* | 4 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE3G | Wages and Salary Administration* | 4 | 3 | 25 | 75 | 100 | 4 |
| | | EVENT MANAGEMENT | | | | | | |
| | 17MBAE3H | Fundamentals of Event Management | 4 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE3I | Event Marketing | 4 | 3 | 25 | 75 | 100 | 4 |
| | | RETAIL MANAGEMENT | | | | | | |
| | 17MBAE3J | Fundamentals of Retailing | 4 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE3K | Retail Store Management | 4 | 3 | 25 | 75 | 100 | 4 |
| | BANKING | | | | | | | |
| 17MBAE3L | Islamic Banking - I | 4 | 3 | 25 | 75 | 100 | 4 | |
| 17MBAE3M | Banking Technology - I | 4 | 3 | 25 | 75 | 100 | 4 | |
| | Non -Major Elective | | | | | | | |
| 6. | 17MBAN31 | Managerial Practices | 5 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAWS3 | Workshop on Managerial Skills -III | 2 | - | - | 50 | 50 | 1 |
| | 17MBACV3 | Comprehensive Viva-Voce | - | - | - | 50 | 50 | 1 |

* Denotes that student should select any two subjects from the list of electives



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| PART - III CORE | Title : OPERATIONS RESEARCH | Subject Code : 17 MBA C31 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To enable students to make decisions under conditions of certainty and uncertainty.
- To improve the capability to formulate effective models in organizational decision making process.

UNIT 1

Introduction to OR and its applications – Resource allocation models: Linear Programming – Formulations of Managerial problems – Graphical and simplex methods.

UNIT 2

Duality and Dual Simplex methods - Integer programming – Enumeration method – Optimality Principle.

UNIT 3

Transportation - Assignment Problems and Travelling Salesman Problem.

UNIT 4

Game Theory – Pure and mixed strategies, Dominance Principle and Applications to Business.

UNIT 5

Queuing models – Markov chain and its applications to business.

Text Books:

1. Kanti Swaroop, Gupta P.K. Man Mohan(2005), “Operations Research”,. Sultan Chand and Sons.

Reference Books:

1. Sundaresan V Ganapathy Subramanian K S and Ganesan K (2002) Resource Management Techniques A R Publications 2002
2. Hamdy A. Taha(2008): Operations Research-An Introduction, Prentice Hall, 8th. Edition, 2008.
3. Srinivasan G (2000) Operations Research : Principles and Applications. Author. Publisher, PHI Learning Pvt. Ltd.

Chapter and Sections:

Unit I - Kanti Swaroop, Gupta P.K. Man Mohan(2005), “Operations Research”,. Sultan Chand and Sons.

Unit II - Sundaresan V Ganapathy Subramanian K S and Ganesan K (2002) Resource Management Techniques A R Publications 2002

Unit III - Kanti Swaroop, Gupta P.K. Man Mohan(2005), “Operations Research”,. Sultan Chand and Sons.

Unit IV - Kanti Swaroop, Gupta P.K. Man Mohan(2005), “Operations Research”,. Sultan Chand and Sons.

Unit V - Sundaresan V Ganapathy Subramanian K S and Ganesan K (2002) Resource Management Techniques A R Publications 2002.



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| PART - III CORE | Title : BUSINESS ENVIRONMENT AND LAW | Subject Code : 17 MBA C32 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To acquire a reasonable knowledge in Business.
- To make the students to understand the various Environments and Laws which are affecting Business.

Unit 1- Introduction to Business Environmental Law

Internal environment – External Environment – Micro Environment – Macro environment – Environmental Analysis and Strategic Management.

Unit 2- Environmental Analysis and Forecasting

Types of Environmental Analysis – Social – Cultural- Economic- Political – Geographical Environmental Analysis – Importance of environmental Analysis – Limitations.

Unit 3 – Acts and laws on Business Environment in India

The foreign exchange Management Act 1992 – SEBI Act – Consumer Protection Act – Environment Protection Act - Right To Information Act – Goods and Services Tax (GST)

Unit 4 – Technology and Business Development

Concept of Technology – Technology and Business Development – Social Responsibility of Business – Corporate Governance – Indian Corporate Culture- Socio Audit.

Unit 5- Liberalization

Economic Liberalization and its impact on Indian Business – Causes of the Breakdown of the public Sectors in Indian Business Development- Impact of Business on Emerging Middle class in India.

Text Book:

1. Francis Cherunilam, Business Environment and Policy, Himalayan Publisher

Reference Books:

1. S.Sankaran, Business Environment, Margham
2. K.R.Bulchandani, Business Law for management, Himalayan Publisher
3. C.B.Gupta, Business Environment and laws, Sultan Chand & sons.

Chapter and Sections:

Unit I - Francis Cherunilam, Business Environment and Policy, Himalayan Publisher

Unit II - K.R.Bulchandani, Business Law for management, Himalayan Publisher

Unit III - S.Sankaran, Business Environment, Margham

Unit IV - Francis Cherunilam, Business Environment and Policy, Himalayan Publisher

Unit V - Francis Cherunilam, Business Environment and Policy, Himalayan Publisher



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| PART - III CORE | Title : BUSINESS RESEARCH METHODS | Subject Code : 17 MBA C33 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- To make the student understand the basis of Research and its importance.
- To give exhaustive knowledge in the field of Research that helps the student to gain knowledge which can be immediately applied during research.

Unit 1

Research: Meaning – objectives-motivation-types of Research-significance of research- Research methods V/S Methodology- Research on functional areas of Business- Process /steps in Research. Criteria of good research- Problems encountered by Researchers in India- Defining Research Problem, Sources of Research problems – Techniques involved in Defining Research Problem

Unit 2

Research design: Meaning and Need- Features of Good Research- Important concepts related to Research Design- Different Research Designs – Basic principles of Experimental Designs- Census and Sampling Design- Types of sampling-Steps in sampling- Criteria for selecting a sample procedure- Sampling and Non-sampling error-Sample size –Advantages and limitations of sampling.

Unit 3

Measure in Research- Meaning of Scaling- Measurement Scales - - Sources of error in Measurement – Test of Sound measurement- Reliability and validity- Scale Classification Bases – important Scaling Techniques-Scale construction techniques- Methods of data Collection- Primary data Collection Methods: Observation, Interview, Questionnaire and Schedules- Difference between questionnaire and Schedules- Secondary data collection, Case studies and Other methods of data Collection

Unit 4

Processing of Data- Types of Analysis – Statistics in Research - Data analysis- Specific applications of measures of Central tendency, Dispersion- Measures of Relationship: Correlation and Regression- Applications in research – Hypothesis : Meaning, Types, Errors and Testing of Hypothesis- Parametric and Non –parametric Tests

UNIT-5

Meaning of Interpretation- Techniques of interpretation-Significance of Report writing- Different steps in Report Writing- Layout of the Research Report- Types of Reports- mechanics of Writing Research Report- Presentation of Research Reports- Application of Computers in Research- Statistical Software Packages

Text Book:

1. Research Methodology: Methods and Techniques: Kothari C.R. (2004), New Delhi, New Age International Publishers.

Suggested Readings:

1. Naresh K Malhotra (2007), Marketing Research, Pearson Education.
2. S.N.Murthy/U.Bhojanna (2007), Business Research Methods- - Excel Books/2e.



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|--------------------------------|---|---------------------------------|
| PART - III ELECTIVE | Title : PERSONNEL SELLING AND SALES MANAGEMENT | Subject Code : 17MBA E3A |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To give knowledge to the students to do effective Personnel Selling process.
- To provide an introduction to personal selling as a systematic process and to help the students to know about the basic activities of sales management: evaluation, budgeting.

Unit 1: Personal Selling: Personal Selling and Marketing Evaluation of Personal Selling (as an element of promotional mix) & other elements of promotion mix-sales promotion, advertising and publicity. Professional selling process - prospecting, pre-approach, sales presentation and demonstration, negotiating, sales resistance and objections, closing, follow-up.

Unit 2: Sales force management: Duties & responsibilities of Sales Executive – Co-Ordination & Inter relations with other Departments. - Distribution network relations.

Unit 3: Sales force management - personnel management in the selling field - Recruiting and Selecting sales personnel.

Unit 4: Sales training programmes: Planning, executing and evaluating sales training programmes - motivating sale personnel - compensating sales personnel - sales meeting and sales contests - evaluating and supervising sales personnel.

Unit 5: Controlling the sales efforts - The sales budgets - Quotas - Sales territories - Sales control and Cost analysis.

Text Book:

1. Still, Cundiff and Govoni (2008), “Sales Management Decisions, Strategies and Cases”, Prentice Hall of India.

Suggested Readings:

1. Churchill, Ford Walker(2008), “Sales Force Management”, Tata Mc Graw Hill
2. Keith Rosen(2009) Coaching Salespeople into Sales Champions: A Tactical Playbook for Managers and Executives, Wiley Publication.
3. Andris A. Zoltners, Prabhakant Sinha, Sally E. Lorimer, “Sales Force Design for Strategic Advantage” Amazon Publication



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| PART - III ELECTIVE | Title : SERVICES MARKETING | Subject Code : 17MBAE3B |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- The objective of this syllabus is to make the student understand the importance of Services Marketing
- To make the student understand the importance of Services marketing with emphasis on various aspects of service marketing which make it different from goods-marketing.

Unit 1:- Introduction – Nature – Services marketing and Relationship marketing.

Unit 2:- Services marketing mix – 7 P's – barriers to marketing of services – marketing on the low ebb – beliefs, perceptions, and attitudes - Services Blueprint Concept.

Unit 3:- Developing an effective service mission – Services marketing segmentation.

Unit 4:- Positioning and differentiation of services – marketing plans for services.

Unit 5:- Marketing of some selected services in the Indian context – Personal care marketing – Entertainment marketing – Education marketing – Communication marketing – Bank marketing – Hotel marketing – Hospital marketing.

Text Book:

1. SM. Jha(1997), Services Marketing, Himalaya Publishing house

Suggested Readings:

1. Vasanthi Venugopal & Raghu V.N, Services Marketing,
2. P.N. Reddy and Appanaiah , Services marketing, McGraw Hill
3. Rajendra Nargundkar (3rd edition), Service marketing, Himalaya publishing house



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| PART - III ELECTIVE | Title : ADVERTISING AND SALES PROMOTION | Subject Code : 17MBAE3C |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To provide the students an opportunity to gain and understanding the importance of Advertisement to promote the sale.
- To make them familiarize with various Sale Promotion Strategies.

Unit 1: Introduction: Nature and scope of Advertising – Classification of Advertising- Types of Advertising- Role of Advertising in India’s economic development- Social and Economic Aspects of Advertising.

Unit 2: Functions and Benefits of Advertising: Functions of Advertising- Commercial Functions- Social Functions- Economic Functions- Psychological Functions- Benefits of Advertising to Manufacturers, Wholesalers, Retailers, Salesman.

Unit 3: Social and Ethical Aspects of Advertising: Social issues in Advertising- Responsibility of the Advertiser- Positive social effects of Advertisement- Social ill effects of Advertisement- Controversial effects of Advertising.

Unit 4: Sales Promotion: Nature- Concept of Sales Promotion- Definition- Evolution- Objectives- Methods of Sales Promotion- Reasons for growth of Sales Promotion- Sales Promotion of Services.

Unit 5: Sales Promotion Strategies: Objectives- Communication- Medium of Reach- Budgets- Promotional Strategies- Evaluation of Sales Promotion Strategy.

Text Book:

1. Rathor , “Advertising Management”, Himalaya Publishing House
2. P.Saravanavel, S.Sumathi, “ Advertising And Salesmanship”, Margham Publications.

Suggested Readings:

1. S H H Kazmi, Satish K Batra (2009), "Advertising And Sales Promotion", Excel Books India.
1. Churchill, Ford Walker(2008), “ Advertisement Management”, Tata Mc Graw Hill
2. George E. Belch & Michael A. Belch (2011)"Advertising and Promotion: An Integrated Marketing Communications Perspective, 9th Edition" Hardcover Publication/.



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| PART - III ELECTIVE | Title : INDIAN CAPITAL MARKETS | Subject Code : 17MBAE3D |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To know about the Indian financial system and its players
- To understand the security market regulations
- To keep abreast of recent financial services

Unit-1

Indian financial system – overview of financial markets in India – Capital markets – money market – government securities markets – foreign exchange market – derivative markets – financial sector reforms.

Unit-II

Structure and institutions in capital market and money market – new issues market – new instrument – role of new issues in industrial financing – floating of new issues – options and futures.

Unit-III

Securities market in India – origin and emergence – types of securities – investment environment -sources of investment information – stocks exchange in India – trading in stock exchange – listing of securities.

Unit-IV

Security market regulations: securities contract and regulation act, 1945 – regulation and control of stock exchanges, OTCEI, NSE and BSE – market intermediaries: stock brokers – underwriters. SEBI Act: guidelines relating to capital issues, pricing, insider trading and investor protection.

Unit-V

Overview of financial services – merchant banking – functions, regulation – leasing and hire purchasing, factoring, venture capital, mutual funds, credit rating agencies, depositories.

Text Book & References:

1. Khan M.Y., FINANCIAL SERVICES Tata MC Graw Hill 1998.
2. Varshney, P.N., INDIAN FINANCIAL SYSTEM, Sultan chand & Sons 2000. REFERENCES
1. SEBI guidelines, Nabhi publications New Delhi.
3. Gordon and Natarajan, FINANCIAL MARKETS AND SERVICES, Himalaya publishing House 2001.
4. Sontomero and Babbel, FINANCIAL MARKETS, INSTRUMENTS AND INSTITUTIONS , MC Graw Hill 1998. 103
5. Vasant Desai, THE INDIAN FINANCIAL SYSTEM, Himalaya publishing House.

Suggested Readings :

1. Understanding Futures Markets KOLB Prentice Hall
2. How the bond marketing Institute of Finance Prentice Hall
3. Financial Management and Policy James C Van Horne Prentice Hall
4. Khan M.Y., FINANCIAL SERVICES Tata MC Graw Hill 1998



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| PART - III ELECTIVE | Title : INTERNATIONAL TRADE FINANCE AND DOCUMENTATION | Subject Code : 17MBAE3E |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To appraise the students on the basics of international trade and related concepts, policies and procedures
- To make them aware of the documentation done for exports and imports
- To familiarize them in financing of foreign trade in India

Unit 1:

Introduction: Export documentation; Foreign exchange regulations; ISO 9000 series and other internationally accepted quality certificates; Quality control and pre-shipment inspection ; Export trade control ; Marine insurance; Commercial practices.

Unit 2 :

Export Procedures: General excise clearances; Role of clearing and forwarding agents; shipment of export cargo; Export credit; Export credit guarantee and policies; Forward exchange cover; Finance for export on deferred payment terms; Duty drawbacks.

Unit 3:

Import Procedures: Import licensing policy; Actual user licensing; Replenishment licensing; Import-export pass book; Capital goods licensing; Export houses and trading houses

Unit 4:

Export Incentives: Overview of export incentives-EPCG, Duty drawbacks, duty exemption schemes, tax incentives; Procedures and documentation.

Unit 5:

Trading Houses: Export and trading houses schemes – criteria, procedures and documentation; Policy and procedures for EOU/FTZ/EPZ/SEZ units

Text Books:

1. G Jeevanandam, Foreign Exchange - Practice, Concepts and Control, Sultan Chand

Suggested Readings:

1. Francis Cherunilam, International Trade & Export Management, Himalaya Publications
2. V.A.Avadhani, International finance, Himalaya Publications
3. M.L.Varma, International Trade, Vivek



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|--------------------------------|---|--------------------------------|
| PART - III ELECTIVE | Title : TRAINING AND DEVELOPMENT | Subject Code : 17MBAE3F |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- The course is about the training and employee development and human performance improvement in organizations.
- To help the students to understand how to relate training to better job performance.

UNIT 1: Definition – Scope – Objectives - Benefits of training – The roles and Responsibilities of Training – A training process Model – Difference between training and development.

UNIT 2: Training Needs Analysis : - Organizational Analysis, Task analysis, Person Analysis – Requirements Analysis –Methods and Techniques of Training Needs and Assessment - Assessment of methods.

UNIT 3: Training Design – Factors affecting – Constraints in the Design – Organizational/ Environmental Constraints- Budgeting for Training – Types of Cost- Developing objectives- Facilitation of learning.

UNIT 4: Training Methods - off the job- on the job training methods: Lectures - Group Discussion Methods – Case Study Method – Role play Method- Management game Method- In-Basket Exercise Method- Sensitivity Training Method- Computer Based Training Method.

UNIT 5: Approaches to Management Development – Overview of the Managerial Job - Management Development implications - Sources of knowledge and skills - Evaluation – Types and methods – Rationale for Evaluation - Types of Evaluation Instrument - Types of Evaluation Data - Evaluation Designs - Training Audit.

Text Book:

1. Dr. B. Janakiraman (2007) "Training & Development: Indian Text Edition" Dreamtech Press.

Suggested Readings:

1. Rolf P Lynton, Udai Pareek (2005)“Training for Development” Vistar Publications.
2. Steve Truelove (2007)“Training and Development” Jaico Publications.



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| PART - III ELECTIVE | Title : WAGES AND SALARY ADMINISTRATION | Subject Code : 17MBAE3G |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- The objectives of this course is to familiarize the students with the dynamics of Wages and Salary Administration.
- To create awareness on Wage legislation in India

Unit: - 1: Wage Concepts and Theories : Introduction- Wage Meaning- Minimum Wage- Need based minimum wage- Fair Wage- Living Wage- Payments : Time rate and piece rate system- Payment by BPR- Theories of Wages – Components of Wages – Factors influencing the determination of Wages.

Unit: -2:

Job Evaluation System – Definition – Methods of Job Evaluation – Pay determination : Pay problems of the business – Management’s approach to pay problems, Salary Administration of Top executives.

Unit:-3 : Wage Incentives : Incentive: Meaning- Principles and procedures for installing Incentive systems – Individual incentive plans, Group incentive plan.

Wage Fixation : Wage fixation through collective bargaining – Wage boards- Adjudication.

Unit: -4 : Wage Policy : Objective of Wage Policy – Need for Wage Policy – Recommendations on Wage Policy – National Wage Policy.

Unit:-5 : Wage Legislation : Payment of wages Act, 1936 – The minimum wages Act, 1948 – Payment of Bonus Act, 1965 – Equal Remuneration Act, 1976.

Text Book :

1. A.M.Sharma (2004), ‘Understanding Wage System’ Himalaya Publications

Suggested Readings:

1. Richard I. Derson, “Compensation Management”, Pearson Education,
2. Elizabeth Lanhen, Administration of Wages and Salaries
3. David W.Belcher , Wages and Salary Administration



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| PART - III ELECTIVE | Title : FUNDAMENTALS OF EVENT MANAGEMENT | Subject Code : 17MBAE3H |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To create awareness on the importance of Event management among the emerging middle class in India.
- To make the students learn and practice events for Their Self Employment

UNIT-1

Events and Event Management: Need, Scope, Definition of events, Types of event, Understanding Events, MICE – Meaning, Industry, Important statistics, India as MICE Destination, MICE Services, Types of MICE Services India offers

UNIT -2

Principles of event management planning, Creativity, Event feasibility, The competitive environment, Setting realistic objectives, Taking a brief, Time lines and budgeting.

UNIT-3

Marketing Event Management, Event marketing plan, The marketing mix, Branding, Promotion of Event and Market research

UNIT - 4

PR in Event Management, Creating a PR plan for events, Press and broadcast media relations, Briefing journalists, Preparing press releases, Commissioning and briefing photographers, Maximizing publicity opportunities for your event

UNIT -5

Event Management System: Use of Computers in Event Management, Event Management Softwares, Event Management Control with Budgets, CPM and PERT Techniques, Event Scheduling and Alternative & Support plan for Control.

Text Book

1. Razaq Raj, Paul Walters and Tahir Rashid(2013), Events Management Principles and Practice, Sage Publications.

Suggested Readings:

1. Kishore, Ganga Sagar Singhand Devesh Haran(2011), ' Event Management: A Blooming Industry and an Eventful Career' HaranChand Publications Pvt. Ltd. -
2. Swarup K. Goyal (2009)Event Management, Adhyayan Publisher
3. Savita Mohan (2008), Event Management & Public Relations, Enkay Publishing House.



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| PART - III ELECTIVE | Title : EVENT MARKETING | Subject Code : 17MBAE3I |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To make the students understand the need for event marketing and Branding.
- To train the students to effective in Event Marketing Communications.

UNIT – 1

Introduction to Event Marketing -The Objectives of Event Marketing, Role of CRM- Importance and Scope of CRM- Emerging Social Network marketing - Opportunities and Challenges in Marketing of Events in Social Network

UNIT – 2

Event and the Marketing Communications Environment, Event Marketing Planning and Creating your own event. Marketing Mix, 7 Ps, - Future of Event Marketing.

UNIT – 3

Communicating with the Customer - Business Presentation: Written and oral presentation – work – team presentation – Delivering the business presentation visual aids – slides – electronic presentation – hand-outs – delivering the presentation.

UNIT – 4

Introduction to PR – Concept, Nature, Importance, Steps, Limitations, Objectives Media – Types of Media, Media relations, Media Management PR strategy and planning – identifying right PR strategy, Brain Storming sessions, Event organization, writing for PR

UNIT – 5

Sponsorship, Core principles of sponsorship, Type of Sponsorship , Reason of companies sponsor, Importance- Elements of good sponsorship- Identifying appropriate sponsors and sponsorships- Managing sponsors relationships

Text Book

1. Saget Allison(2006), 'The Event Marketing Handbook' Wiley Publications

Suggested Readings:

1. Bruce E. Skinner, Vladimir Rukavina (2002), Event Sponsorship, Wiley Publications.
2. C. A. Preston (2005), Event Marketing: How to Successfully Promote Events, Festivals, Conventions, and Expositions, 2nd Edition, Wiley Publications.
3. Judy Allen (2005), "Event Planning: The Ultimate Guide To Successful Meetings, Corporate Events, Fundraising Galas, Conferences, Conventions, Incentives and Other Special Events, 2nd Edition, Wiley Publications.



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| PART - III ELECTIVE | Title : FUNDAMENTALS OF RETAILING | Subject Code : 17MBAE3J |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To create awareness on Indian Retail Industry and Its socio Economic Significance
- To make them to understand the Fundamentals of Retailing

Unit 1

Introduction: Definition and Meaning of Retailing, Overview of Indian Retail Industry Social and economic significance of retailing, Structure of retailing and distribution, Opportunities in retailing. Types of retailing, Retailing Formats, Challenges of effective retailing

Unit 2

Retail buying behaviour : The buying process, Types of buying decisions, Social factors influencing the buying process- Retailing strategy : Retail market strategy, Target market , Growth strategies, Global growth opportunities, The strategic retail planning process

Unit 3

Financial strategy and retail locations: Financial objectives and goals, Types of locations, Location and retail strategy, Legal considerations, Evaluating specific areas for locations, Evaluating a site for locating a retail store, Trade area characteristics, Estimating potential sales for a store site, Negotiating lease

Unit 4

Merchandise management : Merchandise management overview, Forecasting sales, Developing an assortment plan, Setting inventory and product availability levels, Establishing a control system for managing inventory, Allocating merchandise to stores, Analyzing merchandise management performance, Developing and sourcing private label merchandise, Negotiating with vendors

Unit 5

Store Management: Store management responsibilities, Recruiting , selecting, Motivating and managing store employees. Store design objectives, Store design elements, Visual merchandising, Creating an appealing store atmosphere, Strategic advantage through customer service, Customer service quality, Service recovery

Text Book

1. K.V.S.Mathan (2009), Fundamentals of Retailing. TMH

Suggested Readings:

1. Retailing management by Michael Levy Barton Weitz Ajay Pandit, M. G.Hills, 8th Edition (2012)
2. Retailing management by Swapana Pradhan, M. G.Hills, 4th Edition (2012)
3. Managing retailing by Piyush Kumar Sinha and Dwarika Prasad Uniyal, Oxford Uni Press, India



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| PART - III ELECTIVE | Title : RETAIL STORE MANAGEMENT | Subject Code : 17MBAE3K |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To make the Students understand about Retail Store Management.
- To familiarize the concepts in Store Management.

Unit 1

An Overview of retail operations, Stores organisation, Selection of right Location, Different layout & designs- Retail Arithmetic: Quantitative terms related with a retail store and its calculation

Unit 2

Pre-Store opening: Role of operations in opening a store, Filling the store with merchandise, Concept of Distribution centre, various activities at the distribution centers- Store opening and closing: Store opening and closing process.

Unit 3

Material identification system - Receiving and inspection, storage system- Preservation of materials in the storage- Stock management: Relevance of stock management to retail operations, Various types of stock checks, Taking care of quality inside a store

Unit 4

The store audit: Store appearance, presentation, stock, cleanliness, HR in operations- Store finance and controls: stock valuating, stock verification, Accounts receivable, cash management, budgeting, Day to Day cash management

Unit 5

Loss prevention and shrinkage control: Importance of security measures, Methods & ways to reduce shrinkage, reasons for shrinkage, Scrap and surplus management- The customer service desk, Exchange of defective products, Loyalty Programs for a store.

Text Book:

1. Iyer, B.Sriram., Retail Store Operations, Tata Mc Graw Hill, 2011

Suggested Readings:

1. Levy, Michale & Barton. A. Weitz, Retailing Management, Tata Mc Graw Hill.3rd ed
2. Menon, K. S., Stores Management, Macmillan India, 2 Ed., 2006



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| PART - III ELECTIVE | Title : ISLAMIC BANKING - I | Subject Code : 17MBAE3L |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objective:

- To define the scope and significance of Islamic Economics with special reference to the central problems of economic choice.
- To familiarize students with basic concepts used in Islamic finance

Unit I: Introduction

Islamic Economic System - Introduction to Economic Theories and Islamic Economic System - The Historical Development of Islamic Banking - Islamic Commercial law - The Basic Prohibitions - Qard and Dayn in Islamic banking - Principles of Islamic Commercial Contracts - Islamic law of Sale and Purchase

Unit II: Modes of Shari'ah-Compliant Transactions - Introduction to Islamic Modes of finance - Non-participatory Modes of finance - Participatory Modes of finance - Accessory Modes

Unit III: Islamic Banking Operations - Key Characteristics of Islamic Banking Operations - Islamic Retail Banking Services - Islamic Investment Management Services - Corporate Banking Services - Investment Banking in Islamic Banks - Treasury and International Banking

Unit IV: Governance, Regulation, Accounting Issues in Islamic Banking Social Responsibility and Internal Controls - Regulatory Compliance Functions - Risk Management in Islamic financial Institutions - Modern trends in Islamic Banking

Unit V: Introduction to Islamic Insurance (Takaful) - Insurance and the Introduction of Takaful - Takaful and Retakaful

Suggested Reading:

1. Ahmad, Habib (eds), Theoretical Foundation of Islamic Economics, Islamic Research and Training Institute, Islamic Development Bank, 2002.
2. Khan, W. Masood, Towards an Interest Free Islamic Economic System, Leicester, UK: The Islamic Foundation, 1985.
3. Siddiqi, M.N, Some Aspects of Islamic Economy, Delhi, M. M. I. Publishers, 2002.



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| PART - III ELECTIVE | Title : BANKING TECHNOLOGY - I | Subject Code : 17MBAE3M |
| Semester : III | HOURS : 4 hours / Week | CREDITS : 4 |

Objectives:

- To define Banking Operations for the Students
- To familiarize students with basic concepts used in Banks

Unit I : Branch Operation and Core Banking - Introduction and Evolution of Bank Management – Technological Impact in Banking Operations – Total Branch Computerization – Concept of Opportunities – Centralized Banking – Concept, Opportunities, Challenges & Implementation

Unit II : Delivery Channels - Overview of delivery channels – Automated Teller Machine (ATM) – Phone Banking – Call centers – Internet Banking – Mobile Banking – Payment Gateways – Card technologies – MICR electronic clearing

Unit III: Back office Operations - Bank back office management – Inter branch reconciliation – Treasury Management – Forex Operations – Risk Management – Data centre Management – Network Management – Knowledge Management (MIS/DSS/EIS) – Customer Relationships Management (CRM)

Unit IV: Interbank Payment System - Interface with Payment system Network – Structured Financial Messaging system – Electronic Fund transfer – RTGS – Negotiated Dealing Systems & Securities Settlement Systems – Electronic Money – E Cheques

Unit V: Contemporary Issues in Banking Techniques – Analysis of Rangarajan Committee Reports – E Banking - Budgeting – Banking Softwares – Case study: Analysis of Recent Core Banking Software.

Basic Text Book & References:

1. Financial Services Information Systems - Jessica Keyes Auerbach publication;
2. 2nd edition (March 24, 2000)(Text Book) 2. Kaptan S S & Choubey N S., “E-Indian Banking in Electronic Era”, Sarup & Sons, New Delhi, 2003
3. 3. Vasudeva, “E – Banking”, Common Wealth Publishers, New Delhi, 2005



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| PART - IV NME | Title : MANAGERIAL PRACTICES | Subject Code : 17MBAN31 |
| Semester : III | HOURS : 5 hours / Week | CREDITS : 4 |

Objectives:

- The subject will provide a fundamental exposure to the theories in management and practice by contemporary executives with international perspective.
- To make them understand the nature of management and its components.

UNIT 1: Nature of Management : Introduction – Meaning of Management – Definition of Management – Features or characteristics of Management – Functions of management – Importance of management – Administration and management – Difference between administration and management.

UNIT 2: Planning : Introduction – Meaning – Definition - characteristics of planning – Objectives of planning – Nature of planning – Forecasting - Importance of planning – Advantages of planning – Steps in planning process.

UNIT 3: Organization :

Introduction – Meaning – Definition – Functions of Organization – Principles of Organization – Nature or characteristics of Organization – Importance / Advantages of Organization – Classification of Organization.

UNIT 4: Staffing :

Introduction – Definition – Elements of staffing – Functions of staffing – Processing of staffing – Proper staffing – Advantages of proper staffing – Recruitment: Meaning – Definition – Sources of Recruitment.

UNIT 5: Controlling:

Introduction – Definition – Areas or Scope of control – Steps in control process – requirements of effective control system – Techniques of control.

Text books

1. T.Ramasamy – Principles of Management – Himalaya Publishing House.

Suggested Readings:

1. Stephen P. Robbins- Organizational Behavior - prentice Hall of Indian Pvt., Ltd., New Delhi
2. Dr. T. Ramasamy – Principles of Management.
3. K. Aswathappa – Organizational behavior.



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| PART - III CORE | Title : WORKSHOP ON MANAGERIAL SKILLS - III | Subject Code : 17 MBA WS3 |
| Semester : III | HOURS : 2 | CREDITS : 1 |

Objective:

- It is essential for a student in Management Studies to know the Strengths and weakness of the members in the team.
- The aim of this syllabus is to make the student understand Group Dynamics and Its importance.

UNIT I: BODY LANGUAGE

Introduction – body talk – voluntary and involuntary body language – forms of body language – parts of body language – origin of body language – uses of body language – body language in building interpersonal relations – body language in building industrial relations – reasons to study body language – improving your body language – types of body language – gender difference – female interest and body language – shaking hands with women – interpreting body language – developing confidence with correct body language .

UNIT II: STRESS MANAGEMENT

Introduction – meaning – at one level stress may be a positive aid to performance – at one level stress may be a negative aid to performance – effects of stress – kinds of stress – source of stress – few other common source of stress – case study – behaviour identified with stress – assessing the existing of stress – what are the signs of stress? – Spotting stress in you – stress management tips teenage stress – make the morning memorable.

UNIT III: PREPARING CV/ RESUME

Introduction – meaning- difference among bio-data, CV and resume – the terms- the purpose of CV writing – types of resumes – interesting facts about resume – CV writing tips – CV / resume preparation – the dos – CV/resume preparation-the don'ts – resume checkup – design of a CV – entry level resume – the content of the resume – electronic resume tips – references – power words – common resume blunders – key skills that can be mentioned in the resume – cover letters – cover letter tips.

UNIT IV: GROUP DISCUSSION

Introduction – meaning of GD – why group discussion ? – characters test in a GD – Tips on GD - types of GD – skills required in GD – consequences of GD – behaviour in a GD – essential elements of GD – different characters in GD – traits tested in a GD – GD etiquette – areas to be concentrated while preparing for GD – initiating a GD – techniques to initiate GD – nonverbal communication in GD – movement and gestures to be avoided in GD – topics for GD.



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UNIT V: INTERVIEW SKILLS

Introduction – why an interview? – types of interview – interview panel – types of questions asked – reasons for selecting a candidate – reasons for rejecting a candidate – on the day of interview table – attending job fair – common mistakes that you wouldn't want to do- questions the candidate should not ask during the interview – post interview etiquette – how does one follow up? – telephonic interview – dress code at interview – typical questions asked – interview mistakes – quick tips – how to present well in interview – tips to make a good impression in an interview – job interview – basic tips – how to search for job effectively – interview quotations.

Reference Book: Soft Skills Dr.K.Alex S.CHAND



IV SEMESTER

| S. No | Sub. Code | Subject Title | Hrs / Week | Exam hrs | CA | SE | Tot | Crd |
|------------|-------------------------|---|------------|----------|-----|-----|-----|-----|
| 1. | 17MBAC41 | Entrepreneurship | 6 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MBAC42 | Strategic Management | 6 | 3 | 25 | 75 | 100 | 4 |
| 3, 4 & 5.* | | MARKETING ELECTIVE | | | | | | |
| | 17MBAE4A | i) Buyer Behaviour* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4B | ii) Industrial Marketing* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4C | iii) Tourism Management | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4D | iv) Airlines Management | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4E | v) International Logistics Management | 6 | 3 | 25 | 75 | 100 | 4 |
| | | FINANCE ELECTIVE | | | | | | |
| | 17MBAE4F | i) Merchant Banking and Financial Services* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4G | ii) Investment and Portfolio Management * | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4H | ii)Global Financial Management | 6 | 3 | 25 | 75 | 100 | 4 |
| | | HUMAN RESOURCES* | | | | | | |
| | 17MBAE4I | International Human Resource Management* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4J | Organisational Development * | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4K | Human Resource Accounting* | 6 | 3 | 25 | 75 | 100 | 4 |
| | | EVENT MANAGEMENT* | | | | | | |
| | 17MBAE4L | Special Events | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4M | Event Production and Logistics* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4N | Event Marketing and Branding* | 6 | 3 | 25 | 75 | 100 | 4 |
| | | RETAIL MANAGEMENT | | | | | | |
| | 17MBAE4O | Visual Merchandising* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4P | Mall Management* | 6 | 3 | 25 | 75 | 100 | 4 |
| | 17MBAE4Q | Retail Storage And Warehousing Management | 6 | 3 | 25 | 75 | 100 | 4 |
| | | BANKING | | | | | | |
| 17MBAE4R | Islamic Banking –II | 6 | 3 | 25 | 75 | 100 | 4 | |
| 17MBAE4S | Banking Technology - II | 6 | 3 | 25 | 75 | 100 | 4 | |
| 17MBAE4T | International Banking | 6 | 3 | 25 | 75 | 100 | 4 | |
| 17MBACP1 | PROJECT WORK | | | | 100 | 100 | 5 | |
| 17MBACV4 | Comprehensive Viva-Voce | - | - | - | 50 | 50 | 1 | |

* Denotes that student should select any three subjects from the list of electives



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| PART - III CORE | Title : ENTREPRENEURSHIP | Subject Code : 17MBAC41 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To make them to understand the meaning of Entrepreneurship on the basis of various definition and theories.
- To motivate the students to become entrepreneur in the changing Economic Environment.

Unit 1:- Introduction to Entrepreneurship-Entrepreneurship Process- Entrepreneur – Types of Entrepreneurs-The Entrepreneurial Mindset - Intrapreneurship or Corporate Entrepreneurship.

Unit 2:- Business Modeling, Business Planning, Business Creation – Financial and Technical Evaluation – Project Appraisal – Common Errors in Project Formulation.

Unit 3:- Evolution of a Start-Up- Collaboration- Networking- Intellectual Property -Innovation for Business Growth -Knowledge Management- Human Resource- Leadership and Governance.

Unit 4:- Entrepreneurial Growth Strategies- Franchising, Sickness & Revival and Exiting the Venture – Women Entrepreneurship -Rural Entrepreneurship- Social Entrepreneurship- Family Business and Entrepreneurship- Technology Driven Entrepreneurship.

Unit 5:- Institutional Framework for Entrepreneurship – Role of funding agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship(NEN) & National Institute of Entrepreneurship Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB) - Schemes - PMRY, JRY.

Text Book:

1. Entrepreneurship: Theory and Practice by Raj Shankar, TMH Publication, New Delhi

Suggested Readings:

1. Entrepreneurship: New Venture Creation - David H. Holt
2. Entrepreneurship - Hisrich Peters
3. Dynamics of Entrepreneurship Development -VasantDesai



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| PART - III CORE | Title : STRATEGIC MANAGEMENT | Subject Code : 17MBAC42 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To provide a critical overview about business implications and opportunities arising from growing New Socio - Economic and Environmental concerns.
- To enhance the ability to integrate special concerns into business operations & to evolve corporate strategies.

Unit 1:- Definition, nature, scope, and importance of strategy; and strategic management (Business policy). Strategic decision-making. Process of strategic management and levels at which strategy operates. Role of strategists. Defining strategic intent: Vision, Mission, Business definition, Goals and Objectives, Balanced score card Approach to Objectives.

Unit 2:- Internal Appraisal – The internal environment, organizational capabilities in various Functional areas and Strategic Advantage Profile. Methods and techniques used for organizational appraisal (Value chain analysis, Financial and non financial analysis, historical analysis, Industry standards and benchmarking, Balanced scorecard and key factor rating). Identification of Critical Success Factors (CSF). Environmental Appraisal—Concept of environment, components of environment. Environmental scanning techniques- ETOP, QUEST and SWOT (TOWS)

Unit 3:- Corporate level strategies-- Stability, Expansion, Retrenchment and Combination strategies. Corporate restructuring. Concept of Synergy. Business level strategies—Porter's framework of competitive strategies; Conditions, risks and benefits of Cost leadership, Differentiation and Focus strategies. Location and timing tactics. Concept, Importance, Building and use of Core Competence. Competitor Analysis- Outsourcing Strategy

Unit 4:- Strategic Analysis and choice—Corporate level analysis (BCG, GE Nine-cell, Hofer's Product market evolution and Shell Directional policy Matrix). Industry level analysis ; Porters's five forces model. Qualitative factors in strategic choice. Strategy implementation: Resource allocation, Projects and Procedural issues. Organization structure and systems in strategy implementation. Leadership and corporate culture, Values, Ethics and Social responsibility. Operational and derived functional plans to implement strategy. Integration of functional plans.

Unit 5:- Strategic control and operational Control. Organisational systems and Techniques of strategic evaluation. Ethics and Social Responsibility issues related to strategic management.



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Text Book: 1. Azar Kazmi, (2010) Strategic Management: , New Delhi, Tata mc Graw Hill Publication.

Suggested Readings:

1. Thomson and Stricland (2003), Strategic Management: Concept and Cases, New Delhi, Tata Mc Graw Hill Publication.
2. Pearce, Robinson and Mital(2008), Strategic Management: Formulation, Implementation and Control, New Delhi, Tata mc Graw Hill Publication.
3. Hitt. Ireland and Hoskisson(2012): Strategic Management: Competitiveness and Globalization: Concept and Cases, USA, Thomson Higher education.



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| PART - III ELECTIVE | Title : BUYER BEHAVIOUR | Subject Code : 17MBAE4A |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- The main objective of this syllabus is to develop and understand the aspects of buyers behaviour.
- To understand the buyer behaviour and their motives and the ways and means to handle them.

Unit 1:- Introduction – The diversity of consumer behavior – Consumer research – Market segmentation

Unit 2:-The consumer as an individual – Consumer needs and Motivation – Consumer Personality – Consumer perception.

Unit 3:- Consumer learning - Memory - Consumer Involvement – Consumer attitudes –Attitude Changes Strategies – Marketing Communication Process.

Unit 4:-Consumer & Cultural Influences – Social Class Influences & Consumer Behaviour – Group Influences.

Unit 5:- Consumer Decision Process – Problem Recognition – Information Search – alternatives & Selections – Outlet section & Purchases – Post purchase action.

Text Book:

1. Leon G. Schiffman, Leslie Lazar Kanuk, S.Ramesh Kumar(2010) "Consumer Behaviour" Paerson Education.

Suggested Readings:

1. Suja R Nair (2001), " Consumer Behaviour" Himalaya Publishing House.
2. Satish K Batra , SHH Kazmi (2008) " Consumer Behaviour" Excel Books.
3. Martin M. Evans, Gordon Foxall, Ahmad Jamal (2009)" Consumer Behaviour" Paperback – Unabridged.



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| PART - III ELECTIVE | Title : INDUSTRIAL MARKETING | Subject Code : 17MBAE4B |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To make the students to develop skills in identifying and industrial marketing problems and help them to creating awareness in critically analyze.
- The specific industrial marketing issues.

Unit 1:- The industrial marketing system – the industrial marketing concept – types of industrial goods – nature of demand for industrial goods – industrial buyer motives – purchasing process – industrial buying situation – segmentation of industrial goods – value addition in industrial marketing.

Unit 2:- Industrial product - Assessing market opportunities – estimation of market potential – developing product strategy – strategic formation – technology and industrial market places – planning industrial product lines – pre – sales & post sales service – value analysis – vendor analysis.

Unit 3:- Industrial product pricing – Industrial product pricing determinants – pricing objectives – pricing decision analysis – pricing strategies – leasing of industrial products.

Unit 4:- Marketing channels – marketing channel participants – marketing channel strategy – marketing logistics: physical distribution and customer service.

Unit 5:- Industrial product promotion – personal selling – developing industrial sales force – planning, organizing & counseling, selling function – direct marketing – advertising – sales promotion – public relations and publicity – relationships marketing;

Text Book:

1. P.K. Ghosh (2005) Industrial Marketing, Oxford University Press .

Suggested Readings:

1. Industrial Marketing - Michael D. Hutt & Thomas W. Spoh.
2. Industrial Marketing - Francis Cherunilam
3. Industrial Marketing - Richard M Hill, Ralph S Alexender and James S.

Cross



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| PART - III ELECTIVE | Title : TOURISM MANAGEMENT | Subject Code : 17MBAE4C |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives

- To realize the potential of tourism industry in India;
- To understand the various elements of Tourism Management; and

Unit – I Tourism: an overview: Elements, Nature and Characteristics - Typology of Tourism – Classification of Tourists - Tourism network - Interdisciplinary approaches to tourism - Historical Development of Tourism - Major motivations and deterrents to travel.

Unit – II Tourism Industry: Structure and Components: Attractions – Accommodation – Activities – Transportation - F&B – Shopping - Entertainment - Infrastructure and Hospitality – Emerging areas of tourism - Rural, Eco, Medical, MICE, Literary, Indigenous, Wellness, Film, Golf, etc., – Ideals of Responsible Tourism - Alternate Tourism.

Unit – III Tourism Impacts : Tourism Area Life Cycle (TALC) - Doxey's Index - Demonstration Effect – Push and Pull Theory - Tourism System - Mathieson and Wall Model & Leiper's Model - Stanley Plog's Model of Destination Preferences - Demand and Supply in tourism - Tourism regulations - Present trends in Domestic and Global tourism – MNC's in Tourism Industry.

Unit – IV Tourism Organizations: Role and Functions of World Tourism Organization (WTO), Pacific Asia Travel Association(PATA), World Tourism & Travel Council (WTTC) - Ministry of Tourism, Govt. of India, ITDC, Department of Tourism, Govt. of Puducherry, FHRAI, IHA, IATA, TAAI, IATO.

Unit – V Overview of Five Year Plans with special reference to Eleventh Five Year Plan for Tourism Development and Promotion, National Action Plan, National Tourism Policy - Code of conduct for safe and Sustainable Tourism for India.

References:

1. Chuck Y. Gee, James C. Makens & Dexter J. L. Choy (1989), THE TRAVEL INDUSTRY, Van Nostrand Reinhold, New York.
2. Page J. Stephen & Brunt Paul (2007), TOURISM- A MODERN SYNTHESIS, Thomson Pub, London.
3. Ray Youell (1998), TOURISM-AN INTRODUCTION, Addison Wesley Longman, Essex.
4. Sunetra Roday, et al (2009), TOURISM OPERATIONS AND MANAGEMENT, Oxford.



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| PART - III ELECTIVE | Title : AIRLINES MANAGEMENT | Subject Code : 17MBAE4D |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To understand the structure and dynamics of airline industry;
- To understand the airport and airlines management linkages
- To study the international airfares, regulations and formalities to travel, and
- To study different organizations and their contributions to airlines management.

Unit – I : Role of IATA and its functions – ICAO; role and functions – Airport Authority of India – Open sky Policy _ International Conventions: Warsaw Convention, Chicago Convention.

Unit – II: Management of Airlines: Types of Airlines – Airline personnel and revenue earning – Airport Management – Study of aircraft parts – The aircraft turnaround The control tower- Airport facilities and special passengers _ Airport access _ Check in facilities – Landing facilities for departing passengers – In-flight services – cabin component – Audio and video projection equipments – Emergency equipments for disembarkation – In-flight entertainment – Class of service with more comfort.

Unit – III: Familiarization with OAG: Three letter city and airport code, airline designated code – minimum connecting time – Global indicators – Familiarization with Air tariff: Currency regulation, NUC conversion factors, General rules, Planning itinerary by air, Introduction to fare construction – Mileage principles – Fare construction with Extra Mileage allowances (EMA) – Extra Mileage surcharge (EMS).

Unit – IV: One Way and Return Trip – Circle trip journey – Open Jaw – Add-on mixed class journey- HIP check – Back Haul Minimum Check (BHC) – CTM check – Indirect Travel Limitation – Around the World fare – Special fares.

Unit – V: Issue of manual ticket – reservation procedure – MPD, MCO, PTA and their purposes – Universal Air Travel Plan: Types of air travel cards – Billing and Settlement Plan (BSP).

References:

1. Jagmohan Negi, AIR TRAVEL TICKETING AND FARE CONSTRUCTION, Kaniska, New Delhi, 2005.
2. OAG, CONSULTANT, IATA, Geneva AIR TARIFF BOOK
3. Stephen Shaw, AIRLINE IN SHIFTS & MANAGEMENT, Ashgate Pub., USA, 2004
4. IATA GUIDE, Geneva
5. Doganis R., AIRPORT BUSINESS, Routledge Publishing, London, 2002
6. Sikdar K., ALL AYOU WANTED TO KNOW ABOUT AIRLINES FUNCTION

Passed in the BOS Meeting
held on 15-3-2017

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| PART - III ELECTIVE | Title : INTERNATIONAL LOGISTICS MANAGEMENT | Subject Code : 17MBAE4E |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To make the students understand the concept of International Logistics Management.
- To make the students familiar with various types of Cargo Transportation.

Unit I: Marketing Logistics: Concept, Objectives and Scope; System elements; relevance of logistics in international marketing; International supply chain management and logistics; Transportation activity- Internal transportation, inter-state goods movement; Factors influencing Distribution Logistics.

Unit II: Transportation: Containerization; CFS and inland container depots; Dry ports; Road-Multi-modal transportation and CONCOR; Role of intermediaries including freight booking, shipping agents, C&F agents.

Unit III: General Structure of Shipping: Characteristics- Types of shipping- linear and tramp operations; Conference Chartering operation- Freight structure and practices; Chartering principles and practices; UN convention on shipping information – Documents for shipping of goods.

Unit IV: Air Transport: Air transportation- Total cost concept, advantages, freight structure and operations; Carrier consignee liabilities- Cargo handling- Information support system.

Unit V: Inventory control and Warehousing: Inventory management- Concepts and application to international marketing; Significance and types of warehousing facilities; Total cost approach to logistics.

Text book:

1. Asopa, V.N SHIPPING MANAGEMENT CASES AND CONCEPTS, Macmillan, New Delhi.

References:

1. Desai, H.P INDIAN SHIPPING PERSPECTIVES , Anupam publishing, Delhi.
2. Khanna, K.K. PHYSICAL DISTRIBUTION, Himalaya Publishing, Delhi.
3. Lambert, D et al STRATEGIC LOGISTIC MANAGEMENT, Tata McGraw Hill, New Delhi.
4. SHIPPING DOCUMENTS AND REPORTS, UNCTAD.



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| PART - III ELECTIVE | Title : MERCHANT BANKING AND FINANCIAL SERVICES | Subject Code : 17MBAE4F |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To outline the linkage between Merchant Banking, Retail Banking and central banking
- To expose the important legislations affecting merchant banking activities
- To identify the various segments of merchant banking industry
- To identify the scope and opportunities in the field of Foreign Exchange and Investments

UNIT 1: Financial system - Introduction, Contemporary Trends in its growth and Development - Regulatory Framework – Financial Services : Nature and Introduction, Evolution of specialized Institutions – Merchant Bankers – Fund Mangers – NBFCs – Leasing Companies – Factors – Venture Capital Funds - Merchant Banking – Functions, Merchant Banking in India, SEBI guidelines for Merchant Bankers - Role of merchant bankers in fund raising -Managing public issue- Pre and Post issue –Book Building - private placement-raising of Funds through Bonds and public deposits.

UNIT 2: Security Markets – Legal Environment: SEBI Act, 1992, Securities Contract Regulation Act 1956, Companies Act 1956 (various provisions relating to securities), RBI rules and guidelines for FII’ - Types of Markets: Primary and Secondary market, primary market – its role and functions-Methods of selling securities in primary market-New financial instruments.

UNIT 3: New Issues - SEBI guidelines for public issues – pricing of issue, promoters contribution, appointment and role of merchant bankers, underwriters, brokers, registrars and managers, bankers etc., Underwriting of issues: Allotment of shares, Procedures for new issues, e-trading.- Secondary market - Role, importance, organization of stock exchanges- listing of securities in stock exchanges; Trading mechanism-Screen based trading: insider trading; Take-over: Internet based trading.

UNIT 4: Mutual Funds – Types – Schemes – Role of private and Public sector Funds – Evaluation of Performance of Fund Manager – SEBI Guidelines on Mutual Funds - Depositories - Role and need: The depositories Act 1996; SEBI (Depositories and Participants Regulation) 1996; SEBI (Custodian of securities) Regulation 1996; National Securities Depository Ltd. (NSDL); Depository participant.

UNIT 5: Activities of Other Financial Service Providers - Credit Rating Agencies – Nature – Factors considered – Rating procedure – Instruments rated – Revisions in rating ; Leasing Companies – Lease rental determination – Break even lease rentals – Factoring Service – Recourse and Non Recourse factoring; Venture Capital Funds – Role and Progress in India

Text Books

1. M.Y. Khan, Financial Services, 4th Edition, Tata McGraw Hill, 2008.

Suggested Readings

1. S. Gurusamy, Financial Services, Tata McGraw Hill, 2008
2. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition 2002.
3. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi, 200



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| PART - III ELECTIVE | Title : INVESTMENT AND PORTFOLIO MANAGEMENT | Subject Code : 17MBAE4G |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To acquire knowledge about stock market and to learn the use of fundamental and technical analysis in the security market
- To apply fundamental and technical analysis for security valuation
- To analyze and understand economic and industry information

Unit 1:

Investment Basics of Investment – Investment, Speculation and Gambling – Investment Categories – Stock Market Functions – Primary Markets and Secondary Markets – Processes of Buying and Selling Securities – Secondary Market Indicators.

Unit 2:

Risk – Return Framework : Security Returns – Measurement of Returns – Risk – Systematic and Unsystematic Risk.

Unit 3:

Fundamental Analysis Basics of Economic, Industry Analysis – Company analysis – Financial and Non-Financial Parameters – Analysis of Financial Statements – Technical Analysis – The Dow Theory – Technical indicators – Charting Techniques.

Unit 4 :

Portfolio Analysis : Portfolio Returns and Risk – Mean Variance Criterion – Markowitz Diversification – Efficient Frontier – Dominance Principle – Capital Market Line – Optimal Portfolio – Sharpe’s Single Index Model – Characteristic Line.

Unit 5 :

Asset Pricing Model Capital Asset Pricing Model (CAPM) – Security Market Line – Assumptions – Arbitrage Pricing Model (APT) – Portfolio Performance Models Basic.

Text Book:

1. Security Analysis and Portfolio Management - Donald Fisher Ronald Jordan
Prentice Hall of India

Suggested Readings:

1. Investment Analysis and Management - Jack Clark Francis McGraw Hill
2. Management of Investment - Jack Clark Francis McGraw Hill



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| PART - III ELECTIVE | Title : GLOBAL FINANCIAL MANAGEMENT | Subject Code : 17MBAE4H |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives

- To have exposure on International Monetary System
- To understand about Balance of Payments and currency Exposure and
- To introduce and familiarize the International Financial Markets and Instruments.

UNIT-I : Globalization - Implications of Globalization – Goals of International Financial Management - scope of International Finance – International Monetary System – Bimetallism – Gold Standard – Bretton Woods System – Floating Exchange Rate Regime – European Monetary System – IMF – WTO – GATT .

UNIT-II: Balance of Payments – The Current Account – The Capital Account – significance - Balance of Payments in the World – Balance of Payments Account of India.

UNIT-III: International Financial Markets – Sources of International Funds – Multilateral Development Banks – Governments/ Governmental Agencies – International Banks – Security Markets Instruments of International Financial Markets– International Equities – GDRs – ADRs - International Money Market and Bond Market Instruments – Euro Bonds – Repos – Euro Commercial Paper – Medium Term Notes – Floating Rate Notes – Loan Syndicates – Euro Deposits – Euro Issues in India.

UNIT-IV: Currency Risk and Exposure – Types of Currency Risk – Management of Currency Risk – Concept and Measurement of Transaction Exposure - Techniques of Transaction Exposure Management – Translation Exposure – methods – Transaction Exposure Vs. Translation Exposure – Exchange Risk Management – Operating Exposure – measuring and managing Operating Exposure.

UNIT-V: Foreign Direct Investment (FDI) – Forms of FDIs – FDI in World – purpose of overseas investment – Benefits to the Host Countries – Effects of FDI – Political Risk.

Basic Text Book & References:

1. Joseph Anbarasu, Global Financial Management, Ane, Delhi, 2010
2. Kevin S, Fundamentals of International Financial Management, Phi, Delhi, 2010
3. Jeff Madura, International Financial Management, Cengage Learning, Delhi, 2008



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| PART - III ELECTIVE | Title : INTERNATIONAL HUMAN RESOURCE MANAGEMENT | Subject Code : 17MBAE4I |
| Semester : IV | HOURS :6 hours / Week | CREDITS : 4 |

Objectives: 1. To make the students understand the problem and prospects of Human Resource at international Level.

2. To help the students to understand the variables affecting human resources performance at domestic level and at international level.

Unit 1:

Globalisation – Drivers of Globalisation – Multiculturalism- Cultural Presispositions- International Dimensions of HRM – Stages of Internationalization and approaches to HRM – Issues in International HRM -Defining International HRM- Difference Between Domestic and International HRM- Variables that moderate difference between HRM and IHRM- Morgan’s Model of IHRM- Global Perspective

Unit 2

Approaches to staffing (Ethnocentric, Geocentric, Polycentric and Regiocentric) – Role of Expatriates – Types (HCN, PCN and TCN), Merits and Demerits of PCN, HCN and TCN - ,HR Planning- Recent Trends in Staffing

Unit 3

Recruitment, Selection, Training and Development: - Issues in staff selection- Facors moderating performance- Selection Criteria- Issue of Dual Career Couples and Female Expatriates- Role of expatriate training- adjustment problems in new cultures – developing managers for global careers- CCT, HCN, TCN Training Process- Emerging Trends in Training for competitive Advantage -

Unit 4

Performance management and Compensation- Setting Performance goals-Identifying variables affecting performance- Appraising the performance- Feedback – Linking rewards and results- Issues in Managing performance in the Global Context – Objectives of international compensation- key components of international compensation program- Approaches to international Compensation-Variance influencing Compensation – Issues in International compensation.

Unit 5

Repatriation – Process-Challenges of re entry- Managing repatriation- Strategies for Succesful Repatriation. Industrial Relation in International Context: Mature- Approaches – Key players- Key issues in IR- IHRM trends and Future Challenges

Text Book

1. Peter J Dowling and Denice E.Welch (2012) ‘International Human Resource Management’, Cengage Learning.

Suggested Readings:

1. IHRM: Managing People in a Multinational Context:
2. IHRM: Text and Cases: Asawthappa K and Sadhana Dash: Tata Mc Graw Hill
3. HRM – A critical text by John storey – Routledge Publicaiton.



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| PART - III ELECTIVE | Title : ORGANIZATIONAL DEVELOPMENT | Subject Code : 17MBAE4J |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To teach the importance of Organisational Development.
- To enhance skills in facilitation on OD skills, group process , communication, collaboration , and to increase awareness of different tools that are used to diagnose organizations as well as interventions used through hands on experience.

Unit 1:

Meaning and Definition - Need for OD – Concept – Nature – Origin / History — Unique Characteristics – Second Generation OD.

Unit 2:

Process of OD – Collection of data – diagnosis - Marvin Six Box Model – Action – OD Interventions & Nature of OD Interventions - Program Management – Phases – Model for Managing change - Application of OD – Lewin's three phase.

Unit 3:

OD Interventions - Types – Classifying - Intervention Strategies and tactics – Change Laboratory Model.

Unit 4:

Managerial Grid – Grid Management by Objectives – OD Strategies at work – Critical Evaluations.

Unit 5:

Organisation Climate & Culture - Conditions and Techniques for Successful OD – Effects – Future Prospects.

Text book:

1. Wendell L French, Cecil H. Bell, Jr (2001) "Organisation Development Behavioural Science Interventions for Organisation improvement" Person Education.

Suggested Readings:

1. Marfulies, Newton, Raja and P. Anthony (2005) "Organisation Development values, process Technology" Nelson.
2. Michael Mc Gill (2006) "Organisation Development for Management" , Wiley.
3. Cumming & Worley (2005) Indian Edition: " Theory Of Organization Development and change" Cengage (Akash press)
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Passed in the BOS Meeting
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Signature of Chairman / HOD



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| PART - III ELECTIVE | Title : HUMAN RESOURCE ACCOUNTING | Subject Code : 17MBAE4K |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To introduce the basic concepts ,functions and process of human resources accounting
- To create an awareness of Human resources accounting in India.

Unit- 1: Human Resources Accounting-An Introduction Human Resource- Its Importance Nature of Human Resources ,Human Resources Accounting-Definition and scope ,Objective of Human Resources Accounting Need for Human Resources Accounting.

Unit-2: Accounting – An Information system for Management

Accounting Concepts and conventions ,Financial Statements ,Profit and loss account or Income Statement ,Balance sheet, The concept of Revenue and Capital Expenditure.

Unit-3: Human Resource Accounting :

Cost-Based Methods – Historical, Replacement & Opportunity Cost Methods ,Economic Value Models – Goodwill, Lev and Schewardz, Flamholtz Methods.

Unit-4: Human Resources accounting in India

Human Resource Accounting in India , Human Resources Accounting in the Public Sector, Human Resources Accounting in the private sector , Practical difficulties in the implementation of Human resources Accounting.

Unit-5: The nature and scope of Human Engineering

Introduction , Definitions , Objectives of Human Engineering , Man-Machine Systems , The stage in the Human Engineering Process.

Text Book:

1. Eric Flamholtz, Human Resources Accounting, HPH

Suggested Readings

1. Edwin H caplan and Stephen Landekish, Human Resources accounting, past, present and future, TMH
2. R.M Blair C.W Whitson, Elements of industrial Systems Engineering, TMH
3. C.B.Gupta, Human Resource Management, Sultan Chand



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| PART - III ELECTIVE | Title : SPECIAL EVENTS | Subject Code : 17MBAE4L |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- Students will be able to: To familiarize the students with the Special Event Management
- To understand the potential Wedding Planning , Live Events , Exhibition Management , Conference Management , Corporate Events.

Unit – I: Wedding Planning – About Wedding Industry, Why Wedding Planner Required, Job Responsibilities of Wedding Planner, Skills required for wedding planner, Career as wedding Planner, Wedding arrangements, budgeting, Understanding Rituals and Customer, Understanding Wedding Flow, Creating Blue Print, Designing Wedding Plan, Understanding entertainment requirements, Celebrity management in wedding.

Unit – II: Live Events – About Live Show Industry, Planning Live Show Job Responsibilities of Live Show Planner, Live Show arrangements, budgeting, Live Show Flow, Creating Blue Print, and Designing Live Show Plan, Understanding technical requirements, Celebrity management in Live Show.

Unit – III: Exhibition Management – Exhibitions Industry, requirement of exhibitions, Job Responsibilities of exhibition organizer, exhibition arrangements, exhibition budgeting, Understanding exhibition Customer, Understanding exhibition Flow, exhibition safety, Creating Blue Print, Designing exhibition Plan, Understanding entertainment requirements, Celebrity management in exhibition.

Unit – IV: Conference Management – About conference management Industry, Planning conference, Job Responsibilities of conference management company, congruence arrangements, budgeting, Live Show Flow, Creating Blue Print, Designing conference Plan, Understanding technical requirements.

Unit – V: Corporate Events – Corporate Events, planning corporate event, Job Responsibilities of corporate event organizer, arrangements, budgeting, Understanding Customer, Understanding Flow, safety, Creating Blue Print, Designing Plan, Understanding entertainment requirements, Celebrity management in corporate events, Understanding need of entertainment in corporate events.



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REFERENCES

1. Festival and Special Event Management - by Johnny Allen, William O'toole, Robert Harris
2. Event Management: A Professional and Developmental Approach by Dimitri Tassiopoulos
3. Planning & Managing a Corporate Event. by Karen Lindsey - by Karen Lindsey
4. Meetings, Expositions, Events & Conventions - 3rd Edition - George Fenich - Mar 2011 - ISBN13: 9780132719919
5. Wedding Planning For Dummies, Second Edition by Marcy Blum
6. The Everything Wedding Organizer: Checklists, Charts, And Worksheets for Planning the Perfect Day! (Everything: Weddings) by Shelly Hagen
7. The Ultimate Wedding Planner & Organizer by Alex Lluch
8. A Comprehensive Indian Wedding Planner - Sarbjit K. Gill (Author)
9. Professional Event Coordination (Wiley Desktop Editions) - Julia Rutherford Silvers (Author)



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| PART - III ELECTIVE | Title : EVENT PRODUCTION AND LOGISTICS | Subject Code : 17MBAE4M |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- Students will be able to: To familiarize the students with the Event Production and Logistics.

UNIT 1:

Introduction, Event Strategic Planning, Management Of Human Resources And Time Challenges Of Teamwork, Developing And Implementing The Design For Your Event, Coordinating Catering Operations, Coordinating Technical Resources, Audio-Visual Effects, Conducting And Analyzing: The Site Inspection, Determining The Production Schedule, Anticipating and Resolving Operational Conflicts

UNIT – 2:

Introduction to Event Production- Event Space Considerations – Tenting - Event Technology – Audio-visual, lighting, sounds, special effects – Entertainment - Other Logistical Considerations – Transportation, guest services, ancillary programs - Catering and Cuisine - Coordinating the Production Process

UNIT – 3

I Phase of Event Production - Select the date, time and location of event – No of Participation – Type of Audience – Nature of Host – Event Process Idea and Delivery of Event- Budgeting of Events: Total Cost/Cost per Person,etc – Sponsorship Identification, Fund Justifications- Proposal of Sponsorship-Identification of Suppliers -Time Line chart of Events

UNIT – 4

II Phase of Event Production - Invitation- Design-Printout- Supporting Printing and Brochure Materials- Presentation ideas – Power points-Location confirmation and modification- Media Briefing Content- Material- Ordering for audio-video support services- Designing and ordering of Mementos- Rearrange Time Line chart of Events-Reviews

UNIT – 5

III Phase of Event Production -Invitation Delivery- Confirmation of Availability, Registration-Confirmation of Guest Speakers-Reminder to necessary audience-Publication in local media-Ordering for special arrangements- Check in check out- Venue Management – Delivery of Events IV Phase of Production: Thanks Note to Event stakeholders-Review of Overall performance, Participant and Client Feedbacks-Follow up

Text Book

1. George G. Fenich(2014), Production and Logistics in Meeting, Expositions, Events and Conventions, Prentice Hall.

Suggested Readings:

1. D.G. Conway(2009), Event Manager's Bible 3e: The Complete Guide to Planning and Organising a Voluntary or Public Event, How To Books publisher.
2. Joe Goldblatt(2011) Special Events: Creating and Sustaining a New World for Celebration, 7th Edition, , Wiley Publications
3. Julia Rutherford Silvers, Professional Event Coordination, 2nd Edition, Wiley Publication



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| PART - III ELECTIVE | Title : EVENT MARKETING & BRANDING | Subject Code : 17MBAE4N |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- Students will be able to familiarize the students with the Event marketing and Branding
- To understand the potential Trade promotions.

Unit – I: Introduction To Marketing - Definition & Functions of Marketing, Core concepts of marketing – a) Need, Want, Desire, Benefits, Demand, Value, Exchange, b) Goods – Services Continuum, Product, Market c) Customer Satisfaction, Customer Delight. d) Approaches to Marketing – Product – Production - Sales – Marketing – Societal – Relational.

Unit – II: Market Segmentation - Definition, Need & Benefits. Bases for market Segmentation of consumer goods, industrial goods and services. Segment, Niche & Local Marketing, Effective segmentation criteria, Evaluating & Selecting Target Markets, Concept of Target Market and Concept of positioning – Value Proposition & USP.

Unit – III: Marketing Mix - Definition of each of the Four P's. Components of each P. Extended 7Ps for services. Significance in the competitive environment. Marketing Planning - Contents of Marketing Plan - Developing Marketing Plan for variety of goods and services.

Unit – IV: Event Marketing - The objectives of Event Marketing, Advertising as a part of marketing. Brand name, Product Design, Post-self support. Event Promotion, Tools of Promotion, Advertising, Public Relations, Tips on writing a New Release, What is a Media kit, Direct Marketing, Word of Mouth, Hospitality, Websites, The Promotion Schedule, Planning a Promotion Campaign for an Event.

Unit – V: Trade Promotion: On site Promotion, Trade Promotion, Other Considerations. Promotion And Publicity Tips, Event Promotion - Tools of Promotion, Advertising, Public Relations, Data collection, List ideas.

Text Book:

Kevin Lane Keller, Strategic Brand Management, PHI/Pearson, New Delhi

REFERENCE:

- 1) Kapferer, Strategic Brand Management, Kogan Page, New Delhi.
- 2) Harsh Varma, Brand Management, Excell Books, New Delhi.
- 3) Event Marketing second edition by C.A. Preston
- 4) Experiential Marketing by Schmitt, Bernd H.



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| PART - III ELECTIVE | Title : VISUAL MERCHANDISING | Subject Code : 17MBAE40 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To provide complete picture about Visual merchandising, which is the key factor in retail management.

Unit 1

Visual merchandising: Definition and functions, Image Mix and Store Exteriors and Interiors: Elements of Display, All I Do Can Sell (AIDCS)- Retail Store—Site and Design, Image Mix: The Top Six Elements, Store Exteriors, Store Interiors

Unit 2

The Basics of Visual Merchandising- Display Basics, Design Basics, Principles of Design, Colour Blocking— Signage, Understanding Materials- Store Planning and Fixtures-The Purpose of Planning Fixtures, Types of Fixtures-

Unit 3

Circulation Plan and Types of Circulation Plans, Meaning and Purpose of a Planogram, Benefits of a Planogram, Implementation and Maintenance of a Planogram- Merchandise Presentation-Meaning and Principles, Categories in Merchandise Presentation, Dominance Factor in Merchandise Presentation, Cross Merchandising-

Unit 4

Window Displays -Meaning and Scope, Types of Setting, Promotional Display Vs. Institutional Display, Window Display-Display Calendar, Sales Tracking, Handling the Mannequin, Props, Lighting, Organising an In-store Event, VM Tool Kit, Quality and Process in Visual Merchandising, Standard Operating Procedures (SOPs)

Unit 5

Experiential Retail -Brand Experience—Brand-centric to Customer-centric, Experience Design—Beyond Visual Merchandising, Generation C—The Changing Consumer, The Magic of Augmented and Mixed Realities , Experiential Retail—The New Retail Scenario

Text Book

- Tony Morgan (2011)Visual Merchandising, Laurence King Publishing; 2nd edition

Suggested Readings:

- Judith Bell and Kate Ternus (Author)(2011), Silent Selling: Best Practices and Effective Strategies in Visual Merchandising, Amazon Books
- Swati Bhalla and Anurag S, Visual merchandising, Tata Mc Graw Hill, 2010
- Pradhan Swapana, Retailing Management, Tata Macgraw Hill



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|--------------------------------|--------------------------------|--------------------------------|
| PART - III ELECTIVE | Title : MALL MANAGEMENT | Subject Code : 17MBAE4P |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To provide knowledge on development of shopping malls and techniques involved in management of the shopping malls.

Unit 1

Emergence of organized retail in India- Evolution of Shopping Malls- Mall management –Factors stimulating growth of malls in India- Challenges of mall development in India- Definition of Shopping mall -Concept of Shopping Mall- Shopping centres v/s mall – Significance of shopping Malls- Types of Shopping Malls- Emerging Trends

Unit 2

Comparison of Western and Indian shopping malls- Introduction to mall development process –Planning and Designing decisions- sites for shopping mall –Mall design process- Capital source of Malls – source of revenue- strategic decisions in Mall financing.

Unit 3

Introduction to Tenant Mix – Zoning –concept of tenant Mix – Five attributes of Tenant Mix –Benefits of tenant Mix- Types of Retail Tenants –Tenant categorization –Tenant Mix modification- Anchor Tenants- Temporary tenants -Future direction of tenant mix management – Handling Anchor Tenants-Popular anchor tenants in Indian Retail malls

Unit 4

Leasing Administration –Types of lease – major provisions related to lease –Leasing process –Best Leasing Practices- Classification marketing activities in Mall-Marketing and promotion during planning, construction and launching phases- Targeting Retail Tenants-Mall promotion calendar-

Unit 5

Facilities offered in mall - Mall Maintenance- Floor Management- Security and Surveillance- Emergency Procedure- In Mall Coordination – Regulatory framework for shopping malls(Introduction, objectives and major provisions of Shop and Establishment Act, other labour laws concerning malls)- Challenges before shopping malls-Life cycle stages of shopping malls

Text Book:

- Harvinder Singh and Srini R Srinivasan(2012) -Mall Management: Operating in Indian Retail Space, Tata McGraw Hill Education Private Limited.

Suggested Readings:

- Hala Refaat and [Hala Refaat](#) , Shopping Mall Management, Amazon Digital Services, Inc.
- Paco Underhill(2005), “Call of the Mall: The Geography of Shopping by the Author of Why We Buy’, Simon & Schuster
Shopping Centers and Other Retail Properties: Investment, Development, Financing, and Management : John Robert White, Kevin D. Gray
- Shopping Centers and Other Retail Properties: Investment, Development, Financing, and Management : John Robert White, Kevin D. Gray



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| PART - III ELECTIVE | Title : RETAIL STORAGE AND WAREHOUSING MANAGEMENT | Subject Code : 17MBAE4Q |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To provide knowledge on warehouse management in retailing perspective.

Unit 1

Warehousing: Meaning and need for warehousing, Types of warehouse, Characteristics of an ideal warehouse, Functions of warehousing, Advantages of warehousing.

Unit 2

Storage: Importance and functions of storage. Location and layout of stores, Management of receipts and issue of materials from stores and Warehousing costs and Stock verification.

Unit 3

Logistic System: Concepts of Logistics, Scope and Objectives of Logistics, System Elements, Importance of Logistics, Relevance of Logistics to Expert Management, Logistics Excellence. Distribution Channel:, Concept, Importance, Types and Primary Distributors.

Unit 4

Cost Reduction Methods: Classification, codification, standardization, simplification and variety reduction, Value Engineering. Disposal of waste and scrap, Materials handling and Materials information system.

Unit 5

Inventory Control: Concept, various costs of inventory, EOQ models, buffer stock, lead time reduction, re-order point / re-order level fixation, exercises –numerical problem solving , ABC, SDE / VED Analysis, Just-In-Time and Kanban System of Inventory management.

Text Book

1. Scott Keller and Brian Keller(2013), “The Definitive Guide to Warehousing: Managing the Storage and Handling of Materials and Products in the Supply Chain (Council of Supply Chain Management Professionals) Pearson Education.

Suggested Readings

1. Raghuram (I.I.M.A.), Logics and Supply Chain Management Macmillan, 2000
2. Emiko Bonafield, Harnessing Value in the Supply Chain, Johnwiley: Singapors, 1999
3. James Tompkins and Jerry Smith (1998) The Warehouse management Hand Book, Tompkins Press.



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| PART - III ELECTIVE | Title : ISLAMIC BANKING II | Subject Code : 17MBAE4R |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives

- To familiarize students with basic concepts used in Islamic finance
- To provide basic understanding of working of Islamic banks and financial institutions
- To introduce Islamic finance instruments used in shariah compliant transaction

Unit I: Introduction

Introduction to financial markets: basic functions; types of markets and profiles; financial Instruments: Islamic financial system: an overview;

- Shariah & Fiqh: Sources and Development
- Important concepts and principles of Fiqh
- Major norms in Islamic finance;

Unit II: Islamic Financial Contracts

- Conditions of contract: Waad, Muwaada, Aqd
- Elements of contract: Contracting parties, subject matter, offer and acceptance.
- Types of contracts

Unit III: Islamic Commercial Banking

- Islamic appraisals of conventional banking
- Operating structure of Islamic banks
- Models of Islamic banking; Sources and application of funds

Unit IV: Islamic Capital Market

- Introduction to capital market
- Types of market & kinds of products
- Islamic appraisal of capital market
- Stock market: shariah screening methods, purification and zakah
- Islamic securities (Sukuk)

Unit V: Islamic Insurance (Takaful)

- Islamic appraisal of conventional insurance.
- Structure and models of Islamic insurance.
- Types of insurance products. General and family takaful. Reinsurance and re-takaful.

Suggested Readings:

1. Iqbal, Munawar and Molyneux, Thirty Years of Islamic Banking: History, Prospects and Performance, Philip, 2005.
2. Iqbal, Zubair and Mirakhor Abbas, 'Islamic Banking', International Monetary Fund, Washinton DC: (Occasional Paper No.49), 1987
3. Khan, S. Mohsin, 'Islamic Interest Free Banking: A Theoretical Analysis', International Monetary Fund Staff Papers, (Washington DC), Vol. 33, No, 1, 1986.



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| PART - III ELECTIVE | Title : BANKING TECHNOLOGY II | Subject Code : 17MBAE4S |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To Understand the students about the Banks internal Functions
- To acquaint the knowledge of Bank Marketing and Customer Relationship

Unit 1: Credit Management - Cardinal principles of sound bank lending – Formulating loan policy – Factors influencing loan policy – Contents of loan policy – Evaluating credit applicant – Loan supervision.

Unit 2: Investment Management - Nature and significance of investment management in commercial banks – Fundamental principles of security investment by commercial bank – Management of security investment – Reviewing investment portfolio – Organization of investment function.

Unit 3: Asset Liability Management and Non-Performing Assets - Concept of ALM – Objectives – Functions – Process – Measurement and Management of Risks Concept of NPAs, NPAs in Indian commercial banks, Causes, Suggestions and steps for containing NPAs, Prudential norms.

Unit 4: Concept of bank marketing - Formulating and implementing marketing strategies for a commercial bank .

Unit 5: Relationship banking- Concept, Distinguishing features, Utility, Fundamentals of relationship banking, Process of developing relationship with customers, Formulating relationship banking strategy

Basic Text Book & References:

1. Srivastava, Divya Nigam, Management of Indian Financial Institutions, Himalaya Publishing House.
2. M. Y. Khan, Indian Financial System , Tata McGraw Hill.
3. Bharati Pathak, Indian Financial System,
4. Gerald Hatler, Bank Investments and Funds Management, Macmillan



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| PART - III ELECTIVE | Title : INTERNATIONAL BANKING | Subject Code : 17MBAE4T |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 4 |

Objectives:

- To have exposure on International Banking System
- To understand about Foreign Exchange and Institutions

UNIT I International Banking vis – a – vis Domestic Banking – Foreign Trade Financing – International Financial Transactions: Lending and Borrowing across borders.

UNIT II Foreign Exchange: Market; rate and Currency – Exchange rate determination under Fixed exchange rate and Floating exchange rate regimes – Determination of exchange rates :Spot and Forward – Basic exchange arithmetic – Forward Cover and Hedging.

UNIT III International Financial Institutions and Functions: World Bank :IMF: Asian Development Bank – International Financial Corporation: International Development Association.

UNIT IV Sources of Foreign Exchange – Export Earnings – Invisible Export Earnings – Role of NRI Remittances – Foreign Direct Investment – Foreign Institutional Investment – External Commercial Borrowings – Global Depositors Receipts – Offshore Borrowings.

UNIT V Foreign Exchange Management – Composition of Foreign Exchange Reserves : Foreign Currencies – Gold and SDR – Current Account Convertibility – Capital Account Convertibility and Precautions.

Basic Text Book & References:

1. International Banking – IIB
2. International Corporate Finance – IIB
3. Frederic S. Mishkin, —Understanding Financial Crisis : A Developing Country
4. Introduction to Foreign Trade, Foreign Exchange Risk Management – IIB



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SEMESTER –I

| S.No | Sub.code | Sub.Title | Hours/week | Exam Hours | C.A. | S.E | Total | Credits |
|------|----------|--------------------------------------|------------|------------|------|-----|-------|---------|
| 1. | 17MCAC11 | Data Structure and Applications | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MCAC12 | Digital Principles and System Design | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | 17MCAC13 | Design and Analysis of Algorithm | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17MCAC14 | Programming in C | 5 | 3 | 25 | 75 | 100 | 4 |
| 5. | 17MCACP1 | Programming using C lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 6. | 17MCACP2 | Data Structure Lab | 5 | 3 | 40 | 60 | 100 | 4 |



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : DATA STRUCTURE AND APPLICATIONS | Subject Code : 17MCAC11 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

Objectives: To give knowledge on the concepts and applications of (i) linear data structures viz., arrays, stacks, queues (ii) linked linear data structures viz., linked lists, linked stacks and linked queues and (iii) Non-linear data structures viz., trees, binary trees

Unit I Introductions and Overview: Definitions – Concept of Data Structure – Overview of Data Structure – Implementation of Data Structures.

Arrays: Definition – Terminology – One Dimensional Array – Multidimensional Array – Pointer Array.

Linked List: Definition – Single Linked List – Circular Linked List – Double Linked List – Circular Double Linked List – Application of Linked List – Memory Representation – Boundary Tag System – De allocation Strategy – Buddy System – Compaction.

Unit II Stacks: Introduction – Definition – Representation of Stack – Operation of Stacks – Applications of Stack.

Queue: Introduction – Definition – Representation of Queue – Various Queue Structure – Applications of Queue.

Unit III Trees: Basic Terminology – Definition and Concepts – Representation of Binary Tree – Operation of Binary Tree – Types of Binary Tree.

Unit IV Graphs: Introduction – Graph Terminologies – Representation of Graphs – Operation on Graphs – Application of Graph Structures – BDD and its Application.

Unit V Tables: Rectangular Tables – Jagged Tables – Inverted Tables – Hash Tables.

Sets: Definition and Terminologies – Representation of Sets – Operation of Sets – Application of Sets.

Text Book:

Classic Data Structure – D Samantha, PHI, 2008

References:

Data Structure and Problem Solving Using C++, 2/E, Allen Weiss, Addison Wesley Longman Publishing company 2006

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| 1 | I | 1, 2, 3 | 1 -6, 13 – 30, 37 -64 |
| 2 | II | 4, 5 | 105 – 185 |
| 3 | III | 6 | 190 – 207 |
| 4 | IV | 7 | 214 – 362 |
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|------------------------|---|--------------------------------|
| Part III : CORE | Title : DIGITAL PRINCIPLES AND SYSTEM DESIGN | Subject Code : 17MCAC12 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

OBJECTIVES:

- To give knowledge about Binary, Octal, Decimal, Hexadecimal number system
- To inculcate knowledge on logic gates and Boolean algebra
- To give knowledge on the physical components of computers like Registers, Multiplexers, Decoders, Flipflops, and counters
- To impart knowledge on System design

UNIT I:

Binary Systems: Digital Computers and Digital System – Binary Numbers – Number Base Conversion – Octal and Hexadecimal Numbers – Complements – binary Codes – Binary Storage and Registers – Binary Logic – Integrated Circuits.

Boolean Algebra and Logic Gates: Basic Definition – Axiomatic Definition of Boolean Algebra – Basic Theorems and properties of Boolean Algebra – Boolean Functions – Canonical and Standard Forms – other Logic Operations – Digital Logic gates – IC Digital Logic families.

UNIT II:

Simplification of Boolean Functions: Map Method – Two and Three variable maps – Four variable Maps – Five and six variable maps – Product of Sums simplification – NAND and NOR implementation – Other two level implementation – Don't care Conditions. **Combinational Logic:** Introduction – Design Procedure – Adders – Subtractors – Code Conversion – Analysis Procedure – Multilevel NAND Circuits – Multi-level NOR circuits – XOR and Equivalence function..

UNIT III:

Combinational Logic with MSI and LSI: Introduction – Binary Parallel adder – decimal adder – Magnitude Comparator – Decoders – Multiplexers – Read only Memory – Programmable Logic array – Concluding remarks. **Sequential Logic:** Introduction – Flip-Flop – Triggering of Flip Flop – Analysis of clocked Sequential circuits.



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Registers, counters and Memory Unit: Introduction – Registers – Shift Registers – Ripple Counters – Synchronous Counters – Timing Sequence – memory unit.

UNIT IV:

Processor Logic Design: Introduction – Processor organization – arithmetic logic unit – Design of arithmetic circuit – design of logic circuit – design of arithmetic logic unit – status registers – design of shifters – processor unit – design of accumulator.

Control Logic Design: Introduction – control organizational hardwired control – Micro program control – Control of Processor unit – Hard wired Control – PLA control – Micro Program Sequences.

UNIT V:

Computer Design: Introduction – System of Configuration – Computer Instructions – Timing and Control – Execution of instructions – design of Computer Registers – design of control – Computer console.
Micro Computer System Design: Introduction – Micro Computer Organization – Micro processor Organization.

Text Book:

Digital Logic and Computer Design.M.Morris Mano, Prentice Hall of India.

Reference:

1. Digital Principles and Applications- Donald .P.Leach, Albert Paul Malvino, TMH 2005
2. Digital Logic and Computer Organization, V.Rajaraman, T.RadhaKrishnan, PHI, 2006
3. Computer Organization and Architecture, William Stallings, PHI 2008

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| 2 | II | 4 , 5 | 105 – 185 |
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| 5 | V | 8 , 9 | 416 – 490 , 497 - 525 |



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : DESIGN AND ANALYSIS OF ALGORITHMS | Subject Code : 17MCAC13 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

OBJECTIVES: 1. To give knowledge on various algorithmic techniques like Divide and Conquer, Dynamic Programming, etc., and to solve problems using these techniques
 2. To study various sorting and searching algorithms and measure the time and space complexity of each algorithm.

Unit I: Introduction: Algorithm – scope of algorithm – steps of development of algorithm – types of problem – types of solution procedure/algorithm – components of algorithm.

Unit II : Graph: Introduction – Terminology of Graph – Network – Tree –Tree traversal Distance based Network Algorithm: Introduction – Dijkstra's Algorithm Floyd's Algorithm – Minimum Spanning Tree Problems.

Unit III: Searching Algorithm: Introduction – Variable Based Search Algorithm – Branch and Bound Algorithm.

Unit IV: Sorting Algorithm : Straight Insertion Sort – Bubble Sort – Heap Sort – Quick Sort – Merge Sort – Analysis of volume and time complexity.

Unit V: Heuristics : Introduction – Traveling sales problem – Simple Heuristic to minimize total tardiness in single machine scheduling problem .

Dynamic Programming: Introduction – Terminology – Dynamic Programming Algorithm – Application Area of Dynamic Programming.

TEXT BOOK:

1. Design an analysis of Algorithm, R.Paneerselvam, Eastern Economy Edition PHI, New Delhi 2007. Chapters 1, 2, 4,5,6,7 (7.1, 7.2, 7.3),11

REFERENCE:

1. Fundamentals of Computer algorithm, Ellis Horowitz, Sartajsahni.

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| 1 | I | 1 | 1 – 19 |
| 2 | II | 2 , 4 | 23 – 49 , 78 – 108 |
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|------------------------|---------------------------------|--------------------------------|
| Part III : CORE | Title : PROGRAMMING IN C | Subject Code : 17MCAC14 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To make understand the concepts and features of C programming language
- To enrich the logical skills of the students by solving problems using C language

Unit-I:Overview of C:

History of C – Importance of C – Basic structure of C – Programming style – Constants, variables and Data types – declaring a variable as constant, volatile – overflow and underflow of data. Operators and expressions: arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – arithmetic expression – evaluation of expressions – precedence of arithmetic operators – type conversion in expression – operator precedence and associativity – mathematical functions – managing I/O operations: reading and writing a character – formatted input, output. Decision making and

Branching: if statement, if...else statement – nesting of if ...else statement – Else if Ladder – Switch statement – the ?:operator – goto statement.

Unit –II:

The While statement – do statement – The for statement – jumps in loops.

Unit-III: Arrays:

One – dimensional array – declaration, initialization – two dimensional array – multi – dimensional array – dynamic arrays – initializations.

Strings:

Declaration, initialization of string variables – reading and writing string – arithmetic operations on strings – putting strings together – comparison – string handling function – table of strings – feature of strings.



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Unit-IV: **User defined functions:**eedmulti function program – elements of user defined function – definition – return values and their types – function calls, declaration, category arrays, strings to functions – scope visibility and life time of variables – multi file programs.

Structures and unions:Defining a structure – declaring structure variables – accessing structure members– initialization – copying and comparing – operations on individual members – arrays of structures – arrays within structures – structures within structures – structures and functions – Unions – size of structures – bit fields.

Unit V: **Pointers:**Accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through its pointer – chain of pointers – pointer expressions – pointer increment and scale factor pointers and arrays – pointers character strings – array of pointers – pointers and structures.

Files:Defining, opening, closing a file: I/O operations on files – error handling during I/O operations – random access file – command line argument.

Text Book:

Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill Publisher Company, 2008.

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| 2 | II | 4, 5, 6 | 83 – 96, 112 – 135, 151 – 176 |
| 3 | III | 7, 8 | 192 – 216, 227 – 261 |
| 4 | IV | 9, 10, 11 | 270 – 312, 324 – 344, 357 – 384 |
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|------------------------|---|------------------------------------|
| Part III : CORE | Title : PROGRAMMING IN C LAB | Subject Code : 17MCACP1 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

1. Program Using formulas
2. Program using if Statement
3. Program using Switch Statement
4. Program using if... Else Statement
5. Program using loop constructs
6. Program using functions
7. Program using Recursion
8. Program using arrays
9. Program using pointers
10. Program using Files
11. Program using structures
12. Program using Command Line arguments



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| Part III : CORE | Title : DATA STRUCTURE LAB | Subject Code : 17MCACP2 |
| Semester : I | Hours : 5 Hours / Week | Credits : 4 |

Write C Programs for the following:

1. To check the presence of an element in an array using binary search.
2. To find the transpose of a non-square matrix.
3. To find the row sum and column sum of a non-square matrix
4. To do any five string operations
5. To manipulate a stack using array data structure.
6. To balance the parenthesis in an expression
7. To manipulate a queue using array data structure
8. Using structures prepare an address book
9. To do inventory control using file
10. To prepare student mark list using file
11. To manipulate a linked list
12. To manipulate a circularly linked list
13. To traverse a binary tree
14. To search an identifier in a binary search tree.



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SEMESTER –II

| S.No | Sub.code | Sub.Title | Hours/week | Exam Hours | C.A. | S.E | Total | Credits |
|------|----------|---|------------|------------|------|-----|-------|---------|
| 1. | 17MCAC21 | Management Accountancy | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MCAC22 | Discrete Mathematics | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | 17MCAC23 | Modern Operating System | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17MCAC24 | Object Oriented Programming using C++ | 5 | 3 | 25 | 75 | 100 | 4 |
| 5. | 17MCACP3 | Operating System Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 6. | 17MCACP4 | Object Oriented Programming using C++ Lab | 5 | 3 | 40 | 60 | 100 | 4 |



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|------------------------|---------------------------------------|--------------------------------|
| Part III : CORE | Title : MANAGEMENT ACCOUNTANCY | Subject Code : 17MCAC21 |
| Semester : II | Hours : 5 Hours / Week | Credits : 4 |

Objectives: 1. To give knowledge on solving problems in Management Accounting
 2. To give knowledge on solving problems in Budgeting & Forecasting
 3. To give knowledge on solving problems in Inventory control system

UNIT I:

Accounting and Accounting records – Journal – Ledger – Subsidiary books – Balance – Final Accounts.

UNIT II:

Objectives of carrying inventory – Inventory costs – EOQ – Safety stock order point – ABC analysis – Comparison of financial statements – Ratio analysis – Limitations.

UNIT III:

Standards for control – Variable / Fixed Costs – Contribution – Break Analysis Standard / Actual cost – Material Price / Usage Variance – Labour cost variance – Sales Price / quantity variance.

UNIT IV:

Budgeting and forecasting – Objectives – Sales, Production, Purchase List – Capital Expenditure and cash budgets.

UNIT V:

Working Capital cycle – Economic and Financial Capital investment through discounted Cash flow – Accounting rate of return – Internal rate of return – back period – sensitivity Analysis.

Text Books:

1. Advance Accountancy, R.L. Gupta, M. Radhasamy, Sultan chand & Sons, 1989
2. Financial Management, S.C. Kuchhal, Chaitanya Publishing House, 1989

Reference Books:

1. Management Accounting, Financial Management and holding company accounts S. Nagarathnam, S. Chand & Co., 1989.
2. Accounting for Managers, Dr. Jawaharlal, Himalaya Publishing



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|------------------------|-------------------------------------|--------------------------------|
| Part III : CORE | Title : DISCRETE MATHEMATICS | Subject Code : 17MCAC22 |
| Semester : II | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To teach the basic concepts of Set theory, Relations and Functions
- To impart knowledge on solving problems using Recurrence relation, Generating functions and logic
- To teach the basic concepts of Lattices, Boolean Algebra and Graph theory

Unit I : Set Theory : Introduction– Sets-Subsets-Venn Diagram-Operations–Properties-Duality. Relations : Cartesian Product-Relations-Operations-Equivalence Relations-Closure and Warshall's Algorithm.

Unit II : Functions: Functions and Operators-One to One-Onto Functions-Special Type of Functions-Inversions-Composition of Functions.

Mathematical Inductions: Technical Proof-Mathematical Induction.

Unit III : Recurrence Relation and Generating Functions: Introduction-Polynomial and their Evaluations-Recurrence Relations-Solution of Finite order homogeneous relations-Solution of Non-homogeneous- Generating Functions-Some common Recurrence Relations-Primitive Recursive Functions.

Unit IV : Logic: Introduction-TF Statements-Connectives-Atomic and Compound Statements-Well-formed Formulae-Truth Tables-Tautology-Tautological Implications and Equivalence of Formulas-Replacement Processes-Normal Forms-Principal Normal Forms

Unit V : Lattices and Boolean Algebra: Lattices-Properties-New Lattices-Modular and Distributive Lattices-Boolean Algebra-Boolean Polynomials-K-map.

Graph Theory: Basic concepts-Matrix Representation-Trees-Spanning Trees-Shortest path Problem-Directed Trees.

Text Book:

1. Discrete Mathematics by Dr. M.K. Venkatraman, Dr. N. Sridharan and N. Chandrasekaran, The National Publishing Company, July 2012

Reference:

1. Discrete Mathematical Structures by Kolman Busby Ross , PHI, 5TH Edition.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|-------------------------|
| 1 | I | 1 , 2 | 1.1 – 1.24 , 2.1 – 2.40 |
| 2 | II | 3 , 4 | 3.1 – 3.13 , 4.1 – 4.2 |
| 3 | III | 5 | 5.1 – 5.33 |
| 4 | IV | 9 | 9. 1 – 9.49 |
| 5 | V | 11 | 11.1 – 11.81 |



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : MODERN OPERATING SYSTEM | Subject Code : 17MCAC23 |
| Semester : II | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To give knowledge on the various concepts of Operating systems
- To impart knowledge on Deadlock, Processor scheduling, Memory management and disk scheduling

Unit-I:

What is an OS?- History – The operating system zoo- mainframe OS- server OS- multiprocessor OS- Real time OS- smart ward OS- operating system concepts- systems calls for process management- system calls for file management- system calls for directory management- OS structure- monolithic systems client- server model.

Unit-II:

Process- the process model- process creation- process termination- process hierarchies- process states- threads- usage- classical thread model- posix threads- implementing threads in user space and kernel- pop up threads- race conditions- critical region- mutual exclusion- sleep and wake up- semaphores- monitors- message passing- scheduling- classical IPC problems.

Unit- III:

Memory abstraction- a memory abstraction- virtual memory- page replacement algorithm- design uses- implementation issues- segmentation- pure segmentation- segmentation with paging- multics.

Unit- IV:

Files- warning- structure- types- access- attributes- file operation- a rectories- single level- hierarchical systems- directory operations- disk space management- life systems backups- consistency.

Unit-V:

I/O devices – device controllers- memory mapped I/O- DMA- goals of the I/O software- programmed I/O- interrupt driven I/O-I/O using DMA-Disk hardware- formatting, scheduling algorithms- condition for deadline- modeling- ostrich algorithm- detection and recovery- avoidance- prevention.



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Textbook:

Modern OS, 3rd Edition, by Andrew S. Tanenbaum, Pearson, Prentice Hall.

Reference:

1. Operating System, Internals and Design Principles, William Stallings, PHI 2008
2. An Introduction to Operating Systems. Concepts and Practice, Pramod Chandra P.Bhatt, Prentice Hall of India, 2007
3. Operating System A Concept Based approach by D.M.Dhamdhare, Second Edition, Tata McGraw Hill Publishing Company, New Delhi 2006.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|--|
| 1 | I | 1 | 31 -46 , 61 – 90 , 95 |
| 2 | II | 2 | 111 -118 , 123 -140 , 145 – 168 , 191 – 195 |
| 3 | III | 3 | 207 – 212 , 216 – 226 , 229 – 237 , 244 – 261 |
| 4 | IV | 4 | 285 – 292 , 296 – 300 , 320 – 322 |
| 5 | V | 5 | 358 – 364 , 371 -375 , 404 , 466 – 484 |



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : OBJECT ORIENTED PROGRAMMING USING C++ | Subject Code : 17MCAC24 |
| Semester : II | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To inculcate knowledge in object oriented programming concepts.
- To enrich the knowledge in inheritance and virtual functions
- To give knowledge on file handling

Unit I: Principles of object Oriented Programming (OOP): Software Evolution Paradigm – Basic concepts of OOP – Benefits of OOP – Object Oriented Language – Applications of OOP. Introduction to C++-Tokens,Keywords,Identifiers and constants – data types –symbolic constants – type compatibility – declaration, dynamic initialization of variables – reference variables – operators – scope resolution – member dereference – memory management operators – manipulators – type cast operators – expressions and their types – special assignment expressions – implicit conversion – operator overloading – precedence – control structures – Functions: main function – function prototyping – return by reference – inline functions – default,const arguments – function overloading – friend and virtual functions – math library functions

Unit II: Classes and Objects: specifying a class – defining member function –making an array with function inline – nesting of member function,private member function – arrays within a class – memory allocation for objects-static data members – static member functions – arrays of objects – objects as function arguments – friendly functions – returning objects – const member functions – pointers to members – local classes.

Unit III: Constructors and Destructors: constructors – parameterized constructors – multiple constructors in class – constructors with default arguments – dynamic initialization of objects – copy,dynamic constructors-constructing two dimensional arrays – destructors. Operator overloading and type conversions: defining operator overloading – overloading unary, binary operators – using friends – manipulation of strings using operators – rules for overloading operators – type conversions.



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Unit IV: Inheritance extending classes: Defining derived classes – Single inheritance – making a private member inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance – virtual base, abstract classes – constructors in derived classes – member classes: nesting of classes – pointers, Virtual functions and Polymorphism; pointers-pointers to objects-‘This’ pointer – pointers to derived classes –virtual functions – pure virtual functions – managing console i/o operations: streams – stream classes – unformatted I/O operations – formatted console I/O operations –managing input with manipulators.

Unit V: Working with files: Classes for file stream operations – opening and closing of a file – End – of – file deletion – more about open (); file modes, file pointers and manipulations – sequential input and output operations – Updating a file: random access – Error handling during file operations – Command line arguments. Templates: class templates, and with multiple parameters – function templates, and with multiple parameters –overloading of templates functions – member function templates – non type template arguments. **Exception handling:** Exceptions handling mechanisms – throwing and catching mechanism – rethrowing exception – specifying exception

Text book:

Object Oriented Programming with c++, Balagurusamy, 5th edition, Tata McGraw-Hill, New Delhi, 2008.

Reference:

C++, The Complete Reference, 4th edition, Herbert Schildt, TMH, 1999.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|------------------------|
| 1 | I | 1, 2, 3 | 4 -11, 16 – 24, 30 -52 |
| 2 | II | 5 | 90 – 124 |
| 3 | III | 6, 7 | 131 – 146, 155 – 170 |
| 4 | IV | 8, 9 | 182 – 209, 226 – 246 |
| 5 | V | 13 | 344 – 359 |



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|------------------------|---|--------------------------------|
| Part III : CORE | Title : OPERATING SYSTEM PROGRAMMING LAB | Subject Code : 17MCACP3 |
| Semester : II | Hours : 5 Hours / Week | Credits : 4 |

I. Unix Programs Lab Cycle

1. Write a shell script for sorting, searching and insertion/deletion of elements in a list
2. Write a shell program to display the good morning, good afternoon, good evening and good night depending on the users log on time
3. Write a shell script which works similar to the wc command. This script can receive the option -l, -w, -c to indicate whether number of lines/ words/characters
4. Write a shell script which deletes all lines containing the word "UNIX" in the files supplied as arguments to this shell script
5. Write a shell script which displays a list of all files in the current directory to which you have read, write and execute permissions
6. Write a shell script which deletes all lines containing the word "xx"
7. Write a shell script containing a function mycd() using which, it is possible to shuttle between directories
8. Write a shell program for basic network commands
9. Write a shell script for renaming each file in the directory such that it will have the current shell's PID as an extension. The shell script should ensure that the directories do not get renamed
10. Write a program which demonstrates the shared memory functions .

II. System Calls Programs Lab Cycle

11. Program using system calls : create, open, read, write, close, stat, fstat, lseek
12. Copying files using system calls
13. Implement ls command using system calls
14. Implement cat command using system calls
15. Implement ps command using system calls.

III. Linux Programs Lab Cycle

16. Program to implement inter process communication using pipes
17. Program to perform inter process comms : sniffer
18. Create two processes to run a for loop, which adds numbers 1 to n, say one process adds odd numbers and the other even
19. Create a file that is shared among some users, write a program that finds whether a specific user has created read and write operations on the file
20. Write a program demonstrating semaphore operation on a shared file for reading but not writing
21. Write a program demonstrating mutual exclusion principle



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22. Write a program which reads a source file name and destination file name using command line arguments and then converts into specified format (i.e. either from lower case to upper case or upper case to lower case or inverse of each)
23. Write a program which takes a set of filenames along with the command line and print them based on their size in bytes either ascending or descending order
24. Write a program which takes directory name along the command line and displays names of the files which are having more than one link
25. Write a program to demonstrate the use of exec family functions
26. Write a program to demonstrate the locking mechanism while accessing the shared files



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| Part III : CORE | Title : OBJECT ORIENTED PROGRAMMING USING C++ LAB | Subject Code : 17MCACP4 |
| Semester : II | Hours : 5 Hours / Week | Credits : 4 |

Write a program in C++

1. To find sum of digits of a number , to reverse a given number and check if it is palindrome
2. To evaluate sine series and cosine series
3. To sort an array using bubble sort and insertion sort
4. To count the occurrences of a number in a set
5. To solve quadratic equation using switch case
6. To do string operation
7. To find Factorial value Fibonacci, GCD using recursion
8. To add, subtract, and multiply two matrix
9. To find row wise sum of a matrix of order mXm
10. To perform binary search and linear search using function
11. To find NCR and NPR value using function
12. To calculate mean, variance, and standard deviation using function
13. To prepare Pay Bill- Structure.



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III SEMESTER

| S.No | Sub.code | Sub.Title | Hours /week | Exam Hours | C.A. | S.E | Total | Credits |
|------|----------|---------------------------------------|-------------|------------|------|-----|-------|---------|
| 1. | 17MCAC31 | Operations Research | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MCAC32 | Database Management System | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | 17MCAC33 | Java Programming | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17MCAN31 | Information Technology and Management | 5 | 3 | 25 | 75 | 100 | 4 |
| 5. | 17MCACP5 | DBMS Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 6. | 17MCACP6 | Programming in J2EE | 5 | 3 | 40 | 60 | 100 | 4 |



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| Part III : CORE | Title : OPERATIONS RESEARCH | Subject Code : 17MCAC31 |
| Semester : III | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To solve Assignment problems and Transportation problems using OR techniques
- To solve LPP using Graphical, Simplex, methods
- To impart knowledge on solving problems in Game theory, queuing theory and PERT/CPM

UNIT I: Transportation problems – Vogel’s Approximation Method – MODI method – Transshipment Problem. Assignment Problem – Travelling salesman Problem.

UNIT II: Game theory – Two Person Zero Sum game * Game with and without saddle Point – Solution of 2 * 2 game – Dominance – Graphical Method.

UNIT III: Network Scheduling – Critical path – CPM – PERT – PERT algorithm – Resource Allocation and scheduling.

UNIT IV: Queuing Theory: Poission and Exponential Distribution, Birth – Death process – queues with combined Arrivals and Departures – Steady State Measures – Special Passion Queues: Including Multiple Serves and / or finite waiting call.

UNIT V:

Linear Programming problems formation – Graphical Method – Simplex Method.

Text Books: Operations Research, KantiSwarup, R.K.Gupta and Manmohan, sultan Chand & Sons, Delhi, 1994.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|-----------------------|
| 1 | I | 10 , 11 | 171 – 207 , 209 – 230 |
| 2 | II | 17 | 313 – 339 |
| 3 | III | 21 | 459 – 480 |
| 4 | IV | 20 | 415 – 421 |
| 5 | V | 2 , 3 | 29 – 56 , 57 – 86 |



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|------------------------|---|--------------------------------|
| Part III : CORE | Title : DATABASE MANAGEMENT SYSTEM | Subject Code : 17MCAC32 |
| Semester : III | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To give knowledge about the basic concepts of Database management systems
- To make understand the need of normalization using various normal forms
- To give knowledge about SQL and on-line Transaction processing

UNIT I:

Introduction: Database System Applications – Purpose of Database Systems – View of Data – Relational Database – Database Design – Object-Based and Structured Databases – Data Storage and Querying – Transaction Management – Database Architecture – Database Users and Administrators. Relational Model: Structure of Relational Database – Fundamental Relational Algebra Operations – Tuple Relational Calculus – Domain Relational Calculus.

UNIT II:

Database Design and E-R Model: Overview of the Design Process – The entity – Relationship Model – Constraints – Entity-Relationship Diagram – Entity – Relationship Design Issues – Weak Entity Sets – Extended E-R Features – Database Design for Banking Enterprise Relational Database Design: Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies – Functional Dependency Theory – Decomposition using Function Dependencies – Decomposition using Multi valued Dependencies.

UNIT III:

Object – Based Databases: Overview – Complex Data types – Structured Types and Inheritance in SQL – Table Inheritance – Array and Multi set Types in SQL – Object – Identity and Reference types in SQL – Implementing O-R Features – Persistence Programming Languages – Object-Oriented Versus Object – Relational Databases.



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UNIT IV:

Storage and File Structure: Overview of Physical Storage Media – Magnetic Disk – RAID – Tertiary Storage – Storage Access – File Organization – Organization of Records in Files – Data Dictionary Storage Indexing and Hashing: Basic Concepts – Ordered Indices – B++ Tree Index Files – Multiple – Key Access – Static Hashing – Dynamic Hashing.

UNIT V:

Transactions: Transaction Concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Executions – Serializability – Recoverability – Implementation of Isolation – Testing for Serializability. Concurrency control: Lock – Based Protocols – Timestamp – Based Protocols – Validation-Based Protocols Recovery System: Failure Classification – Storage Structure- Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions.

Text Book:

Database System Concepts – Fifth Edition, Abraham Silberschats, Henry F.Korth, and S.Sudarshan, TMH, 2006.

Reference Book:

Essentials of Database Management Systems, Alexis Leon, Mathews Leon, Nicole Imprints Pvt. LTd., 2006.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|--|-----------------------------------|
| 1 | I | 1.1 – 1.3 , 3.1 -3.4 | 1-11 , 63 – 93 |
| 2 | II | 2.5 – 2.9 , 6.5 , 7.3 – 7.6 | 36 – 58 , 202 – 210 , 221 – 244 |
| 3 | III | 9.2 – 9.4 ,8.2 | 278 – 288 , 253 – 262 |
| 4 | IV | 10.1 – 10.8 , 11.1 – 11.3 , 11.5 – 11.6 , 11.9 | 339 – 356 , 358 – 369 , 372 – 376 |
| 5 | V | 13.1 – 13.9 , 14.1 – 14.3 , 15.1 – 15.6 | 439 – 465 , 471 – 487 , 511 – 531 |



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|------------------------|---------------------------------|--------------------------------|
| Part III : CORE | Title : JAVA PROGRAMMING | Subject Code : 17MCAC33 |
| Semester : III | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To give knowledge about OOP concepts using JAVA language
- To make understand the features of JAVA as a Platform independent Language
- To train the students by solving various problems using JAVA

UNIT-I : The genesis of java Java's lineage, The creation of java, Why java is important to the internet, Java's magic:

The Bytecode, The java Buzzwords, The continuing Revolution. An Overview of Java-Object-oriented Programming, A first simple program, A second Short Program, Two control statements, Using blocks of code, Lexical issues, The java class libraries.

Data Types, Variables and Arrays

Java is a strongly typed language, The simple types, Integers, Floating-point types, Characters, Booleans, A closer look at literals, Variables, Type conversion and casting, Automatic type promotion in expressions, Arrays, A few words about strings, A note to c/c++ programmers about pointers.

UNIT-II

Operators-Arithmetic Operators, The bitwise operators, Relational operators, Boolean logical operators, The assignment operators, The operators, Operator precedence, Using parentheses.

Control Statements- Java's selection statements, Iteration statements, Jump statements.

Introducing Classes-Class fundamentals, Declaring objects, Assigning object reference variables, Introducing methods, Constructors, The this keyword, Garbage collection, The finalize() method, A stack class.

UNIT-III

Inheritance-Inheritance basics, Using super, Method overloading, Dynamic method dispatch, Using abstract classes, Using final with inheritance, The object class.

Packages and Interfaces-Packages, Access protection, Importing packages, Interfaces.

Exception Handling-Exception-Handling fundamentals, Exception types, Uncaught Exceptions, Using try and catch, Multiple catch clauses, Nested try statements, Throw, Throws, Finally, Java's built-in exception, Creating your own exception subclasses, Chained exceptions, Using Exceptions.

UNIT-IV

Multithreaded Programming-The java thread model, The main thread, Creating a thread, Creating multiple threads, Using isAlive() and join(), Thread priorities, Synchronization, Interthread communication, suspending, Resuming, And stopping threads, Using multithreading.



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I/O, Applets and other topics- I/O basics, Reading console input, Writing console output, The printwriter class, Reading and Writing files, Applet fundamentals, The transient and volatile modifiers, Using instanceof, Strictfp, Native methods, Using assert.

UNIT-V

Networking-Networking basics, Java and the net, Inet address, Tcp/Ip client sockets, URL , URLconnection, Tcp/Ip Server sockets , A caching proxy HTTP server, Datagrams, Inet4address and Inet6address, The URL class.

The Applet class-Applet basics, Applet architecture, An Applet skeleton, Simple applet display methods, Requesting Repainting, Using the status window, The HTML APPLET tags, Passing parameters to applets, The audioclip interface, The appletstub interface, Outputting to the console.

TEXT BOOKS:

Patrick Naughton, “COMPLETE REFERENCE: JAVA 2,”Tata McGraw-Hill,2003.

REFERENCE BOOK:Complete Reference J2EE, Tata McGraw Hill “Jim Keogh”

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|-------------------------|
| 1 | I | 1,2,3 | 3-15,17-39,41-71 |
| 2 | II | 4,5,6 | 73-96,99-126,129-151 |
| 3 | III | 8,9,10 | 189-220,223-246,249-271 |
| 4 | IV | 11,12 | 273-311,313-343 |
| 5 | V | 18,19 | 587-626,627-652 |



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| Part IV : NME | Title : INFORMATION TECHNOLOGY AND MANAGEMENT | Subject Code : 17MCAN31 |
| Semester : III | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

1. To impart knowledge about the various aspects of MIS and System Design
2. To give knowledge in the following Packages:

MS Word, MS Powerpoint, Financial Accounting Package, and SPSS

Unit I: Introductory - Overview of MIS - Structure of MIS - Components of data processing - Inter relationships. Concepts - Information, Systems, Communication Decision Making Process.

Unit II: Information support for managerial process.

1. Transaction support
2. Decision support
3. Planning and control support
4. Data Base Management Systems.

System Design: 1. Analysis 2. Design 3. Implementation, Philosophies, methodologies.

Unit III: MS Word – The Ribbons – creating, editing – layouts - Formatting Text, paragraphs – Styles – Tables – Graphics– Table of Contents –Track changes – mail merge. MS Excel - – The Ribbons – workbook creating, editing, saving documents - modifying a worksheet – Calculations - Sort and Filter – Graphics – Charts – Format worksheets – Developing a workbook – page properties and printing – Layouts.

MS Power point – presentations – Working with content – Adding Content – Graphics – Tables – Charts – Designing of background and Animations – printing. E-Mail – Video Conferencing.

Unit IV: Financial And Accounting Management: Introduction to accounting packages – exercises on creating, altering and displaying –Ledgers and Vouchers – Inventory management – Payroll – Reports using any one financial accounting package.

Unit V: Exercises to use research data and analyze using various statistical methods (learned in statistics management course) using SPSS. Introduction and hands on experience.

Text/ Reference Books.

1. Gordon B Davis - Management Information System
2. Margerethe H Olson, Scott - Principles of Management Information System
3. C Kenneth - MIS Org & Tech

| Sl.No | Unit | Chapter | Page No. |
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| 1 | I | 1, 2, 3 | 4 -11, 16 – 24, 30 -52 |
| 2 | II | 5 | 90 – 124 |
| 3 | III | 6, 7 | 131 – 146, 155 – 170 |
| 4 | IV | 8, 9 | 182 – 209, 226 – 246 |
| 5 | V | 13 | 344 – 359 |



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|------------------------|-------------------------------|------------------------------------|
| Part III : CORE | Title : DBMS LAB | Subject Code : 17MCACP5 |
| Semester : III | Hours : 5 Hours / Week | Credits : 4 |

1. Creating database tables and using data types.
Create table, • Modify table, • Drop table
2. Practical Based on Data Manipulation.
Adding data with Insert, • Modify data with Update, • Deleting records with Delete
3. Practical Based on Implementing the Constraints.
NULL and NOT NULL, • Primary Key and Foreign Key Constraint • Unique, Check and Default Constraint
4. Practical for Retrieving Data Using following clauses.
Simple select clause, • Accessing specific data with Where, Ordered By, Distinct and Group By
5. Practical Based on Aggregate Functions.
AVG, • COUNT, • MAX, • MIN, • SUM, • CUBE
6. Practical Based on implementing all String functions.
7. Practical Based on implementing Date and Time Functions.
8. Practical Based on implementing use of union, intersection, set difference.
9. Implement Nested Queries & JOIN operation.
10. Practical Based on performing different operations on a view.
11. Practical Based on implementing use of triggers, cursors & procedures.
12. Make a Database connectivity with front end tools like – VB, VC++, D2K
13. Design and implementation of Payroll processing System.
14. Design and implementation of Banking system.
15. Design and implementation of Library Information System.



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|------------------------|------------------------------------|------------------------------------|
| Part III : CORE | Title : PROGRAMMING IN J2EE | Subject Code : 17MCACP6 |
| Semester : III | Hours : 5 Hours / Week | Credits : 4 |

1. Java program using swing components Containers, Layout Managers.
2. Java Swing Applications using the GUI Components with a Look and Feel
3. Performing Java Database Connectivity.
4. HTML to Servlet Applications.
5. Applet to Servlet Communication.
6. Developing application using Servlet.
7. Creating JSP program using JavaBeans.
8. Developing aEnterprise Java Bean Application.
9. Designing online application with JSP.
10. Building web applications.



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IV SEMESTER

| S.No | Sub.code | Sub.Title | Hours/week | Exam Hours | C.A. | S.E | Total | Credits |
|------|-----------|--|------------|------------|------|-----|-------|---------|
| 1. | 17MCAC41 | Computer Graphics and Multimedia | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MCAC42 | Data Communications & Networking | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | 17MCAC43 | Software Engineering | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17MCAE41* | Mobile Computing and Wireless Technology | 5 | 3 | 25 | 75 | 100 | 5 |
| | 17MCAE42* | Distributed Systems | 5 | 3 | 25 | 75 | 100 | 5 |
| | 17MCAE43* | Image Processing | 5 | 3 | 25 | 75 | 100 | 5 |
| 5. | 17MCACP7 | Computer Graphics and Multimedia Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 6. | 17MCACP8 | Network Programming | 5 | 3 | 40 | 60 | 100 | 4 |

***One paper has to be chosen out of three elective papers**



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|------------------------|---|--------------------------------|
| Part III : CORE | Title : COMPUTER GRAPHICS AND MULTIMEDIA | Subject Code : 17MCAC41 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To give knowledge about various display devices, input devices on Graphic systems
- To impart knowledge on various algorithms for line drawing, circle generating, ellipse generating, polygon filling, and clipping
- To make understand two-dimensional transformations like scaling, rotation, translation, etc., and Window-to-Viewport coordinate transformation.
- To give knowledge on multimedia concepts viz., Text, Audio, Video, Images and Graphics
- To impart knowledge on Digital Audio and Digital Video systems

Unit I

Computer Graphics Applications: Introduction – Application – Graphical User Devices ; Introduction – Display System – Hardware Components – Graphical user Interface; Introduction – Types of GUI – Designing of GUI – Principles for good GUI Design – User Interface Engineering – GUI Examples – Creating Graphical Interfaces – Scan conversion; Line Drawing algorithms – DDA Algorithm – Bresenham's Line Drawing Algorithm – General Bresenham's Algorithm – Bresenham's Circle generation Algorithm – Poly Filling.

Unit II

Windows and Clipping : Windows and view – port – Window to view – port Mapping – Clipping – Sutherland Cohen subdivision Line clipping Algorithm – Midpoint subdivision Algorithm ; 2D Transformation : Introduction – Representation of a points – Transformation – Transformation between coordinate system – Translation and Homogenous coordinates – Translation – 2D Rotation – Reflection – Scaling – Shearing.

Unit III

3D Transformation: Introduction – Representation of points – Representation of 3D object in Matrix form – 3D Translation – 3D Rotation – 3D Reflection – 3D Scaling – 3d Shearing. 3D Perspective Geometry ; 3D Viewing An Introduction – Terms related to Hidden surfaces; Hidden Surface and lines – Back face Detection – Back face Removal – Z Buffer Algorithm – A Buffer Algorithm



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Unit IV

Multimedia An Overview – Introduction – Presentation and Production – Characteristics of Multimedia Presentation – Hardware and Software Requirements – Uses of Multimedia – Visual display System : Introduction – Cathode Ray Tube – Video Adapter Card – Video Adapter Cable – Liquid Crystal Display – Plasma Display Panel. Text: Introduction – Types – Standards – Font – Insertion of Text – Text Compression – File formats. Image: Introduction – Image type – Seeing Color – Color Models – Basic Steps for Image Processing – Interface Standards – Color Management System – File formats

Unit V

Audio: Introduction – Nature – Fundamentals Characteristics of Sound – Elements of audio system – MIDI – Sound card – Audio file formats and CODECs. Video : Introduction – analog Video Camera – Transmission of Video signals – Video signa formats – Television broadcasting standards – Digital Video –Digital Video Standards – Video File Formats & CODECs, Compression Techniques – JPEG Image Coding standards – MPEG Standards Overview.

Text Book:

1. Computer Graphics, ISRD Group, The McGraw Hill, 2006(UNIT I,II,III)
2. Principles of Multimedia, Ranjan Parekh The McGraw Hill, 2006(UNIT IV,V)

References:

1. Computer Graphics, Multimedia and Animation, Malay K. Pakhira, PHI 2007
2. Computer Graphics,DonaldHearrBanline Barker,PHI,2007
3. Multimedia Making it Work, Tay Vaughan, Tata McGraw Hill 2007

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|----------------------------------|
| 1 | I | 1,2,3,4 | 1-68 |
| 2 | II | 5,6 | 69-106 |
| 3 | III | 7,8,9 | 107-175 |
| 4 | IV | 1,3,4,5 | 1-21,54-90,91-114,130 |
| 5 | V | 7,8,10 | 178-193,207-222,289-328,383-417. |



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|------------------------|---|--------------------------------|
| Part III : CORE | Title : DATA COMMUNICATIONS AND NETWORKING | Subject Code : 17MCAC42 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To teach various types of networking technology and Network topologies
- To impart knowledge on various issues of the different layers of OSI
- To learn about ISDN, TCP, ATM, FDP, UDP
- To introduce the basic concepts of Web page design using HTML

UNIT-I:

Introduction – fundamental concepts – data communications – protocol standards – Standards organization – signal propagation – analog and digital signals – bandwidth of a signal and medium – Fourier analysis – data transmission rate and bandwidth. Analog and digital transmission methods: Introduction – Analog and digital transmission – baud rate and bit per second – analog signal storage and transmission – Nyquist theorem. Modes of data transmission. Multiplexing: Introduction – parallel and serial communication – synchronous, asynchronous and isochronous communication – simplex, Half duplex and full duplex communication – types of multiplexing – FDM versus TDM.

Transmission errors: Detection and Correction – classification – types.

Transmission Media: Introduction – guided media – unguided media – storage capacity.

UNIT II:

Network topologies, switching and routing algorithm: Introduction – different topologies – switching and types – router and routing algorithms. Networking protocols and OSI model: Introduction – protocols in computer communications – OSI model. LAN, MAN, WAN architectures – addressing and transmission mechanism – Packet forwarding – next hop table and routing.

UNIT III:

ISDN – background, architecture, interfaces – Functional grouping – reference points – protocols architecture – B-ISDN.X.25 Protocol – working and characteristics – operations. Frame Relay: need, working – frame format – congestion control – traffic control – FRAD. ATM: overview- packet size – Virtual Circuits in ATM-ATM cells – switching – ATM layers.

UNIT IV:

TCP Basics – Features, Connections, Packet Format.UDP – UDP Packet format.Differences between TCP and UDP. DNS – Email – FTP – TFTP.



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UNIT V:

WWW – history and browsing – HTML – Web Browser Architecture – Web Pages and Multimedia – Remote Login (Telnet) – static and Dynamic Active Web Pages.

Text Book:

1. Data Communication and Networks – Achyuts.Godbole, Tata McGraw Hill, 2005

Reference:

1. Computer Networks, Andrew S.Tanenbum, 4th Ed, Prentice Hall of India, 2006.
2. Data Communication and Networking, William Stallings, PHI, 2007.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|--------------------------------|-------------------------|
| 1 | I | 1.0 -1.10 , 2.0 - 2.6 | 1-21,24-37 |
| 2 | II | 3.0-3.6,4.0-4.3,6.0-6.3 | 40-59,62-76,106-122. |
| 3 | III | 7.0-7.9,8.0-8.4,9.0-9.17 | 124-139,153-174,176-209 |
| 4 | IV | 10.5-10.11,11.0-11.5,12.0-12.8 | 212-232,235-246,248-262 |
| 5 | V | 19.0-19.4,20.0-20.7 | 421-454,457-482 |



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|------------------------|-------------------------------------|--------------------------------|
| Part III : CORE | Title : SOFTWARE ENGINEERING | Subject Code : 17MCAC43 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

- To impart knowledge on systematic way of software development and Maintenance
- To give knowledge about the important activities of the Software Risk Management and SQA
- To introduce the SE Tools

UNIT I: Introduction to Software Engineering – Introduction: Software – what is a good Software? – Software Engineering – Components of Software Engineering – Software Development models – Comparative Analysis of process models. Software Estimation size, Effort and Cost: Software Metrics: Metrics database FPA and MARK II FPA tool for Estimation – Case Illustration – Estimation of Effort and Schedule – COCOMO – Software Cost Estimation.

UNIT II : Software Risk Management: Introduction to Software Risk – Software Risk Management – Risk Mitigation through RMMM plan – Analysis of SEI Software Risk taxonomy. Quality Engineering for software quality Assurance: Quality – ISO 9001 standard software quality and assurance – Testing techniques for SQA – Test Case design – software testing strategies.

UNIT III: System Analysis: System – System Modeling – Structured system Analysis – Software Requirement Specification – Information Systems. System Design – The Design Development process – Data Structure and Database Design – System Design Architecture – System behavior Design – Architecture and choices – Architecture and Non functional requirements – Design Specification and documentation.

UNIT IV: SE Tools: Analysis tools – Modeling representation – Requirements Engineering – Work Breakdown structure – Prototyping – CASE, I-CASE tools. User Interface Design: User Interface – Analysis and Design – Improving effectiveness of UI – Guidelines for Designing UI Components.

UNIT V : Procedural Design and Use of Reusable Components: Design and Structural Programming – Reusable Code – Component based software Engineering – program verification. Testing for software quality: Function Testing System Testing – User satisfaction testing – Test cases and test plans.



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TEXT BOOK:

Software Engineering concepts by Roger Pressman. Software Engineering Principles and Practice by Waman.S.Jawedekar, Tata publishing company Private Ltd, New Delhi 2005.

REFERENCE:

Software Engineering Principles and Practice by Waman.S.Jawedekar, TMH, New Delhi 2005.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------------------------|-----------------------|
| 1 | I | 1.1 – 1.6 , 2.1 – 2.7 | 3 – 33 , 36 – 86 |
| 2 | II | 3.1 – 3.5 , 4.1 – 4.6 | 88 – 113 , 116 – 144 |
| 3 | III | 7.1 - 7.5 , 8.1 – 8.8 | 199 – 232 , 237 – 266 |
| 4 | IV | 5.1 – 5.7 , 10.1 – 10.4 | 155 – 188 , 308 – 338 |
| 5 | V | 11.1 – 11.5 , 22.1 – 22.5 | 339 – 361 , 636 – 668 |



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|------------------------------|---|--------------------------------|
| Part III ELECTIVE | Title : MOBILE COMPUTING AND WIRELESS TECHNOLOGY | Subject Code : 17MCAE41 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 5 |

- Objectives:**
1. To give knowledge on Wireless technology and Mobile Computing
 2. To give knowledge on GSM, WAP and Wireless LAN technologies

UNIT I : Introduction – Mobility of Bits and Bytes – Wireless The beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Applications and Services – Developing Mobile Computing Applications – Security in Mobile wireless space. Mobile Computing Architecture: History of Computers – History of Internet – Internet – The Ubiquitous Network – Architecture for Mobile Computing – Three-tier architecture – Design consideration for Mobile Computing – Mobile Computing through Internet – Making existing applications mobile enabled.

UNIT II : Mobile Computing through Telephony – Evolution of Telephony – Multiple Access Procedures – Mobile Computing through Telephone – Developing an IVR application – Voice XML – Telephony Application Programming Interface. Emerging Technologies: Introduction – Bluetooth – Radio Frequency Identification Wireless Broadband – Mobile IP – Internet Protocol Version 6 – Java Card.

UNIT III : Global System for Mobile Communication – Global System for Mobile Communications GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Address and Identifiers – Network aspects in GSM – GSM Frequency GPRS and Packet Data Network – GPRS Network Architecture – GPRS Network Operations – Data Services in Application for GPRS – Limitations of GPRS – Billing and Charging in GPRS.

UNIT IV: Wireless Application Protocol – Introduction – WAP – MMS Application CDMA and 3G: Introduction – Spread spectrum technology – IS95 versus GSM – Wireless Data Third Generation Networks – Application on 3G

UNIT V: Wireless LAN: Introduction – Wireless LAN advantages – IEEE 802.11 Standards – Wireless LAN architecture – Mobility in Wireless LAN – Deploying Wireless LAN – Mobile Adhoc Networks and Sensor Networks – Wireless LAN Security – WiFi versus 3G Internet networks and Internetworking: Introduction – Fundamentals of call processing – Intelligence in the networks – SS#7 Signaling – IN Conceptual Model – Soft switch – Programmable Networks – Technologies and Interfaces for IN 360.



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TEXT BOOK: Mobile Computing, Technology application and Service creation, AsokeK.Talukder, RoopaR.Yavagal., TMH Publishing Company, New Delhi, 2005.

REFERENCE BOOK: Mobile Communication – ochen Schiller 2nd Edition Pearson 2003

| Sl.No | Unit | Chapter | Page No. |
|-------|------|------------------------------------|-----------------------------------|
| 1 | I | 1.1 -1.9 , 1.12 , 2.1 – 2.8 | 1 – 18 , 24 , 25 , 28 -55 |
| 2 | II | 3.1 , 3.2 , 3.4 – 3.7 , 4.1 – 4.7 | 58 – 63 , 66 – 81 , 84 – 115 |
| 3 | III | 5.1 – 5.7 , 5.9 , 7.1 – 7.8 | 116 – 131 , 138 , 139 , 174 – 190 |
| 4 | IV | 8.1 – 8.4 , 9.1 – 9.7 | 194 – 215 , 218 – 248 |
| 5 | V | 10 .1 – 10.8 , 10.12 , 11.1 – 11.8 | 251 – 279 , 283 , 284 , 287 – 307 |



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|--------------------------------|------------------------------------|--------------------------------|
| Part III : ELECTIVE | Title : DISTRIBUTED SYSTEMS | Subject Code : 17MCAE42 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 5 |

Objectives:

1. To give knowledge on various aspects of Distributed Computing system
2. To give knowledge on Distributed Shared memory, Distributed file system and Distributed databases

UNIT I: Fundamentals

What is Distributed Computing Systems? – Evolution of Distributed Computing Systems - Distributed Computing system models – Why are Distributed Computing Systems gaining popularity? – What is Distributed operating system? – Issues in designing a Distributed operating Systems Introduction to Distributed Computing Environment (DCE).

UNIT II: Distributed shared memory

Introduction – general architecture of DSM systems – Design and Implementation Issues of DSM - Granularity – Structure of Shared Memory Space – Consistency Models – Replacement Strategy – Thrashing – Other Approaches to DSM – Heterogeneous DSM- Advantages of DSM.

UNIT III: Distributed File Systems

Introduction – Desirable features of good Distributed File Systems – File models – File accessing models – File sharing Semantics – File Caching schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles – Case Study: DCE Distributed File Systems.

UNIT IV: Distributed Databases

Features of Distributed versus Centralized databases – Why Distributed Databases – Distributed Databases Management Systems – Reference Architecture for Distributed Databases – Types of Data fragmentation – Distributed Database design: A framework for Distributed Database design – The Design of Database fragmentation – The allocation of fragments.



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UNIT V: Computer Networks

Introduction – Networks types – LAN Technologies – WAN Technologies –
Communication Protocols – Internetworking – ATM Technology.

TEXT BOOK:

1. Distributed operating systems : Concepts and Design by Pradeep K. Sinha , PHI
Learning Private Ltd., 2007 edition
Chapters: 1 (1.1 – 1.7), 2(2.1 – 2.7), 5 (5.1 – 5.11), 9 (9.1 – 9.11)
2. Distributed Databases Principles and Systems by Stefano Ceri and Giuseppe Pelagatti,
McGraw – Hill Book Company, International Edition 1985.
Chapters : 1 (1.1 – 1.3) , 3 (3.1- 3.2) , 4 (4.1 – 4.3) .



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| Part III : ELECTIVE | Title : IMAGE PROCESSING | Subject Code : 17MCAE43 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 5 |

Objectives: To give knowledge on various techniques on digital Image processing like, Image enhancement, Image restoration, Image segmentation and image compression

UNIT I DIGITAL IMAGE FUNDAMENTALS

Elements of digital image processing systems, Vidicon and Digital Camera working principles, Elements of visual perception, brightness, contrast, hue, saturation, mach band effect, Color image fundamentals – RGB, HSI models, Image sampling, Quantization, dither, Two – dimensional mathematical preliminaries, 2D transforms – DFT, DCT, KLT, SVD.

UNIT II IMAGE ENHANCEMENT

Histogram equalization and specification techniques, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contraharmonic mean filters, Homomorphic filtering, Color image enhancement.

UNIT III IMAGE RESTORATION

Image Restoration – degradation model, Unconstrained restoration – Lagrange multiplier and Constrained restoration, Inverse filtering – removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations – spatial transformations.

UNIT IV IMAGE SEGMENTATION

Edge detection, Edge linking via Hough transform – Thresholding – Region based segmentation – Region growing – Region splitting and Merging – Segmentation by morphological watersheds – basic concepts – Dam construction – Watershed segmentation algorithm.



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UNIT V IMAGE COMPRESSION

Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, Vector Quantization, Transform coding, JPEG standard, MPEG.

TEXTBOOKS:

1. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing', Pearson , Second Edition, 2004.
2. Anil K. Jain, , Fundamentals of Digital Image Processing', Pearson 2002.

REFERENCES:

1. Kenneth R. Castleman, Digital Image Processing, Pearson, 2006.
2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.
3. D,E. Dudgeon and RM. Mersereau, , Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference, 1990.
4. William K. Pratt, Digital Image Processing' , John Wiley, New York, 2002
5. MilanSonka et al, 'IMAGE PROCESSING, ANALYSIS AND MACHINE VISION', Brookes/Cole, Vikas Publishing House, 2nd edition, 1999,



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|------------------------|---|--------------------------------|
| Part III : CORE | Title : COMPUTER GRAPHICS AND MULTIMEDIA LAB | Subject Code : 17MCACP7 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 4 |

C-Graphics Lab

1. To implement Bresenham's algorithms for line, circle and ellipse drawing.
 2. To perform 2D Transformations such as translation, rotation, scaling, reflection and shearing.
 3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping.
 4. To perform 3D Transformations such as translation, rotation and scaling.
- Application
5. Bouncing ball
 6. Flood fill
 7. Car moving
 8. Traffic controlling vehicle
 9. Moving wheel
 10. Draw a hut using a simple graphics function.

Multi Media Lab

11. Creating a sample Image
12. Editing Existing Image brightness, mode color, and add edit layer style.
13. Stitch and edit two images into single image use selection tools Lasso tool, clone stamp
14. Study masking concept use audio in the movie.
15. Add buttons , menus and action to the movie.
16. Add effects to the text (Predefined and user defined)
17. Insert text, image, sprites to the movie



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : NETWORK PROGRAMMING LAB | Subject Code : 17MCACP8 |
| Semester : IV | Hours : 5 Hours / Week | Credits : 4 |

1. Write a program using Java to display the Details of local host-inetaddress
2. Write a program using Java to get details of any URL.
3. Write a program using Java to establish One way communication between client & server.
4. Write a program using Java to establish One way communication between client & server with end
5. Write a program using Java to establish Two way communication between client & server.
6. Write a program using Java to establish Two way communication between client & server with end.
7. Write a program using Java with the Conversion of uppcase to lowercase between client & server.
8. Write a program using Java with the Conversion of lowercase to uppcasebetween client & server.
9. Write a program using Java to Check whether the file exist or not
10. Write a program using Java to Copy the file contents to another directory
11. Write a program using Java to establish One way communication Between client & server using UDP.
12. Write a program using Java with the Conversion of uppcase to lowercase between client & server using UDP.
13. Write a program using Java with the Conversion of lowercase to uppcase between client & server using UDP.
14. Write a RMI program to do Mathematical operations.
15. Write a RMI program for Banking application.
16. Write a RMI program for Electricity bill processing.
17. Write a RMI program for Pay roll processing.



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V SEMESTER

| S.No | Sub.code | Sub.Title | Hours /week | Exam Hours | C.A. | S.E | Total | Credits |
|------|-----------|---------------------------------------|-------------|------------|------|-----|-------|---------|
| 1. | 17MCAC51 | Structured System Analysis and Design | 5 | 3 | 25 | 75 | 100 | 4 |
| 2. | 17MCAC52 | Software Project Management | 5 | 3 | 25 | 75 | 100 | 4 |
| 3. | 17MCAC53 | Internet Computing with ASP .Net | 5 | 3 | 25 | 75 | 100 | 4 |
| 4. | 17MCAE51* | Data Mining and Data Warehousing | 5 | 3 | 25 | 75 | 100 | 5 |
| | 17MCAE52* | Soft Computing | 5 | 3 | 25 | 75 | 100 | 5 |
| | 17MCAE53* | Embedded Systems | 5 | 3 | 25 | 75 | 100 | 5 |
| 5. | 17MCACP9 | Web Designing Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 6. | 17MCACV1 | Mini Project | 5 | 3 | 40 | 60 | 100 | 4 |

***One paper has to be chosen out of three elective papers**



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : STRUCTURED SYSTEM ANALYSIS AND DESIGN | Subject Code : 17MCAC51 |
| Semester : V | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

1. To give knowledge on System Development Life Cycle
2. To give knowledge on System Analysis and Design
3. To give knowledge on System testing and Software Quality Assurance

Unit I: Basic system concepts

Systems concepts and theory: The system and basic concepts-Elements of a system-Real life business system-system models-types of systems-Basic system principles-systems approach-Characteristics of system.

System Development Life Cycle: System development process-Capability Maturity Model-System Development Life Cycle(SDLC).

System Development Process Models:Project and process management-Linear sequential model-Prototyping Model-Rapid application development – Spiral Model-Project definition-Software Project Management.

Systems Analysis and Systems Analyst:Scope of Systems analysis and design (SAD)-Responsibilities of a System Analyst-Skillset required to perform systems analysis-Responsibilities of an Information Systems Analyst-Change in system analyst's work patterns.

Unit II: Information systems planning

Project initiation: Preliminary investigation-project identification and selection-project commencement

Feasibility Study: Objectives-types-cost/benefit analysis-steps in feasibility study

Unit III: Information systems analysis

Systems analysis and design methods – Introduction-System analysis methods-business process reengineering-systems design methods.

Information gathering techniques-need-determination of requirements-need for documenting the existing system- fact finding techniques-modern methods for determining system requirements Information Systems Modeling – documenting the existing system –process modeling-logic modeling-data modeling.



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Unit IV: Detailed Information Systems Design

System design-Introduction-characteristics-logical and physical design-application architecture - using physical and logical DFDs in preparing design for existing system

Output design-introduction-objectives-types-key output questions- formats of outputs- designing-turn around documents-layout-gidelines.

Unit V: Software Quality assurance and testing-procedure –testing strategies and validations-

System implementation and operations-system implementation-System security and audit-system operation and maintenance.

TEXTBOOK: STRUCTURED SYSTEM ANALYSIS AND DESIGN ,ISR Group,TMH

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|-------------------------|
| 1 | I | 1,2,3 | 3-15,17-39,41-71 |
| 2 | II | 4,5,6 | 73-96,99-126,129-151 |
| 3 | III | 8,9,10 | 189-220,223-246,249-271 |
| 4 | IV | 11,12 | 273-311,313-343 |
| 5 | V | 18,19 | 587-626,627-652 |



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|------------------------|--|--------------------------------|
| Part III : CORE | Title : SOFTWARE PROJECT MANAGEMENT | Subject Code : 17MCAC52 |
| Semester : V | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

To inculcate knowledge on Software Project Management, Managing People, Organizing Team, Activity planning, Risk Management, Resource Allocation, Monitoring and Control

UNIT I: Introduction – Importance of Software Project Management – Project – Software Projects Vs other types of Project – Contract and Technical Project Management – Activities covered by SPM – Plants, methods and Methodologies – Categorizing Software Projects – Setting Objectives – Stake holders. Requirements specification – Management control. Step Wise: An overview of Project Planning: Ten Steps – Programme Management and Project evaluation: Programme Management – Managing the allocation of resources within programs – Strategic PM – Creating a Programme – Aids to PM – Benefit Management – Evaluation Techniques – Cash flow forecasting – Risk Evaluation.

UNIT II: Selection of an appropriate project approach: Introduction – Choosing Technologies – Technical plan contents list – Choices of process models – Structs Vs Speed of delivery – The waterfall Model – V-Process model – Spiral Model – Software prototyping – Incremental Delivery – Dynamic Systems Development method – Extreme programming – Managing iterative processes – Selecting the most appropriate process model. Software Cost Estimation: Introduction – Where are estimates done? – Problems with over and under estimates – basis for software Estimating – Software effort estimation – Software effort estimation techniques – Albrecht function point analysis Function Points – COCOMO: a parametric model.

UNIT III: Activity planning: Objectives – plan – project schedules – Scheduling and Sequencing Activities – Network Planning models – Adding te time dimension – Identifying Critical path – Shortening the project duration – Identifying the critical activities.

Risk Management: Risk – Categories of Risk – A framework for dealing risk – Risk Identification – Risk assessment – Risk Planning – Risk Management – Evaluating risks to the schedule – Applying the PERT technique – Mote Carlo simulation.

Resource Allocation: The nature of Resources – Identifying resource requirements – Scheduling resources – Creating Critical paths – Counting the cost publishing the Resource schedule – Cost Schedule – Scheduling Sequence.



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UNIT IV: Monitoring and Control: Creating the framework – Collecting the data – Cost Monitoring – Earned Value Analysis – Getting the project back to target.

Managing Contracts: ISO 12207 approach to acquisition and supply of software – The supply process – Type of Contract – Stages in Contract placement – Contract Management Acceptance.

UNIT-V: Managing people and Organizing teams:

Understanding behavior – Organizational behavior: Selecting the right person for the job – Motivation – the Oldham – Hackman job characteristics model – Working in groups – team – Decision making – Leadership – Organizational Structures – Dispersed and Virtual team – The influence of culture – stress and safety.

Software Quality: Place of Software quality in project planning – importance and defining software quality – ISO 9126 – quality measures – External Standards Techniques to enhance quality – quality plans.

Text Book:

1. Software Project Management: Bob Hughes and Mike Cotterell, TMH fourth edition 2006.

Reference:

Software Project Management: A concise study, S.A.Kelkar, PHI, 2007.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---------|------------------------|
| 1 | I | 1, 2 | 1.1 – 1.24, 2.1 – 2.40 |
| 2 | II | 3, 4 | 3.1 – 3.13, 4.1 – 4.2 |
| 3 | III | 5 | 5.1 – 5.33 |
| 4 | IV | 9 | 9.1 – 9.49 |
| 5 | V | 11 | 11.1 – 11.81 |



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| | | |
|------------------------|---|--------------------------------|
| Part III : CORE | Title : INTERNET COMPUTING WITH ASP .NET | Subject Code : 17MCAC53 |
| Semester : V | Hours : 5 Hours / Week | Credits : 4 |

Objectives:

To give knowledge on Web design using HTML, ASP .NET Controls, ADO .NET, XML in .NET, Web Services

Unit – I : HTML Basics : Introduction to Internet, Applications, Web Designing, Web Browser, Web Pages, Home Page, Web Site, Web Servers, WWW, Concepts of Hypertext, Hypermedia, Versions of HTML, Elements of HTML, Syntax, Sections of HTML, Building & Executing HTML Documents

Various tags of HTML : Headings & Title, Text-level elements, Changing Colors, Font, Size using tag, Text Alignment & Paragraph Creating links with <A HREF> tag, Inserting image using tag, Creating Table with <TABLE> tag, rowspan, colspan attributes, <FRAMESET>&<FRAME> tag, <FORM> tag, Creating Text Boxes, Buttons, Checkboxes, Radio Buttons, Hidden Control, Password, Lists & Dropdown list, TextArea. Submitting a Form, Get & Post method. ASP & HTML forms. Working with Cascading Style Sheet (CSS).

Unit – II : ASP .NET Controls : Overview of Dynamic Web Page, Introduction & Features of ASP .NET, Understanding ASP .NET Controls, Applications, Web Servers. Web Forms, Web Form Controls, Server Controls, Client Controls, Adding Controls to Web Form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls a runtime, Running a Web Application, Creating a Multiform Web Project.

Form Validation : Client side and Server side Validation, Validation Controls – Required Field Comparison range, Calendar Control, Ad Rotator Control, Internet Explorer Control.

Unit – III : ADO .NET : Overview of ADO .NET, From ADO To ADO .NET, ADO .NET architecture, Accessing data using Data Adapters and Datasets, using command and data reader, Binding data to data bind controls, displaying data in data grid.

Unit – IV : XML in .NET : XML Basics, Attributes, Fundamentals of XML Classes, Document, Text Writer, Text Reader, XML Validations, XML in ADO .NET, Data Document.

Unit – V : Web Services : Introduction, State Management, View State, Session State, Application State, Service Description Language, Building & Consuming a Web Service. Web Application Development, Caching, Threading Concepts, Creating Threads in .NET, Managing



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Threads, Thread Synchronization, Features of .NET, Role Based Security & Code Access Security, Permissions.

Text Books :

1. The Complete Reference ASP .NET – Mathew Macdonald (TMH)
2. Professional ASP .NET – Wrox Publication(UNIT I)
3. Learn HTML in a Weekend – Steven E. Callihan (TMH)

References :

1. VB .NET Programming Black Book – Steven Holzner (Dreamtech Pub.)
2. Introduction to .NET Framework – Wrox Publication
3. ASP .NET Unleashed – BPB Publication.
4. Learn HTML in a Weekend – Steven E. Callihan (TMH)
5. Using HTML – Lee Anne Philips (PHI)

| Sl.No | Unit | Chapter | Page No. |
|-------|------|----------------|---|
| 1 | I | 17 | 684-708 |
| 2 | II | 5,6,7,9 | 103-133,139-170,171-207,239-272 |
| 3 | III | 12,13,14 | 353-369,373-394,421-443,466-491 |
| 4 | IV | 17 | 525-561 |
| 5 | V | 18,19,20,23,24 | 565-575,581-601,611-636,717-747,753-786 |



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|--------------------------------|---|--------------------------------|
| Part III : ELECTIVE | Title : DATA MINING AND DATA WAREHOUSING | Subject Code : 17MCAE51 |
| Semester : V | Hours : 5 Hours / Week | Credits : 5 |

Objectives:

- To give knowledge in Data Mining and Data Warehousing
- To inculcate knowledge on Association Rule mining, Clustering and Classification techniques
- To learn various applications of data mining techniques

UNIT-I Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

UNIT-II Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept of Hierarchy Generation, Online Data Storage.

UNIT-III Mining Association Rules in Large Databases: Association Rule Mining, Mining Single – Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint – Based Association Mining.

UNIT-IV Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

UNIT-V Cluster Analysis Introduction :Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density – Based Methods, Grid – Based Methods, Model – Based Clustering Methods, Outlier Analysis. Mining Complex Types of Data: Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining



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Spatial Databases, Mining Multimedia Databases, Mining Time – Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

TEXT BOOKS:

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER
Harcourt India.
2. Data Mining Techniques – ARUN K PUJARI, University Press
3. Building the DataWarehouse- W. H. Inmon, Wiley Dreamtech India Pvt. Ltd..

REFERENCE BOOKS:

1. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY.
Pearson Edn Asia.
2. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION.
3. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.
4. Data Mining Introductory and advanced topics –MARGARET H DUNHAM,
PEARSON EDUCATION.

| Sl.No | Unit | Chapter | Page No. |
|-------|------|---|--|
| 1 | I | 1.1 – 1.4 , 1.6 , 1.9 , 3.1 – 3.5 , 4.2 | 1 – 15 , 21 – 27 , 29 – 31 , 36 – 39 , 105 – 150 , 189 – 197 |
| 2 | II | 2.1 , 2.3 – 2.6 | 48 – 50 , 61 – 97 |
| 3 | III | 5.1 – 5.5 | 227 – 272 |
| 4 | IV | 6.1 – 6.6 , 6.8 , 6.10 – 6.12 | 285 – 336 , 344 -346 351 – 360 |
| 5 | V | 7.1 – 7.4 , 7.6 – 7.8 , 7.11 , 10.1 – 10.5 | 383 -407 , 418 – 433 , 451 – 460 , 591 – 641 |



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|--------------------------------|-------------------------------|--------------------------------|
| Part III : ELECTIVE | Title : SOFT COMPUTING | Subject Code : 17MCAE52 |
| Semester : V | Hours : 5 Hours / Week | Credits : 5 |

Objectives:

To Impart Knowledge on Fuzzy Set Theory, Optimization, Neural Networks, Neuro Fuzzy Modeling and Applications of Computational Intelligence

UNIT I FUZZY SET THEORY

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT II OPTIMIZATION

Derivative – based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III NEURAL NETWORKS

Supervised Learning Neural Networks – Perceptrons – Adaline – Backpropagation Multilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT IV NEURO FUZZY MODELING

Adaptive Neuro – Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross – fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TEXT BOOK

1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.

REFERENCES

1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
2. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.
4. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.



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|--------------------------------|--------------------------------|--------------------------------|
| Part III : ELECTIVE | Title : EMBEDDED SYSTEM | Subject Code : 17MCAE53 |
| Semester : V | Hours : 5 Hours / Week | Credits : 5 |

Objectives:

To give knowledge on various aspects of Embedded systems and do embedded programming in C and C++

UNIT I: Introduction to Embedded Systems:

Definition and Classification – Overview of processor and hardware units in an embedded system – Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits.

UNIT II: Real Time Operating Systems:

Definitions of process, tasks and threads – Clear cut distinction between functions – ISRs and tasks by their characteristics – Operating System Services – Goals – Structures – Kernel process Management – Memory Management – Device Management – File System Organization and Implementation – I/O Subsystems – Interrupt Routines Handling in RTOS.

UNIT III: Real Time Operating Systems:

RTOS Task scheduling models – Handling of task scheduling and latency and deadlines as performance.

Inter Process Communication and Synchronization:

Shared data problem – Use of Semaphore(s) – Priority Inversion problem and Deadlock Situations – Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual (Logical) Sockets – Remote procedure Calls (RPCs).

UNIT IV: Programming Concepts and Embedded Programming in C:

Programming in assembly language (ALP) vs. High Level Language – C Program Elements, Macros and functions – Use of Pointers – NULL Pointers – Use of Function Calls – Multiple function calls in a Cyclic Order in the Main Function Pointers – Function Queues and Interrupt Service Routines Queues Pointers.

UNIT V: Embedded Programming in C++:

Object Oriented Programming – Embedded Programming in C++, “C” Program compilers – Cross compiler – Optimization of memory codes. Related Programs.



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TEXT BOOKS:

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct.2003.

References:

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes.
2. David E.Simon, An Embedded Software Printer, Pearson Education Asia, First Indian Reprint 2000.
3. Wayne Wolf, Computers as Components: Principles of Embedded Computing System Design – Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001.
4. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware/Software Introduction, John Eilry, 2002.



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|------------------------|----------------------------------|--------------------------------|
| Part III : CORE | Title : WEB DESIGNING LAB | Subject Code : 17MCACP9 |
| Semester : V | Hours : 5 Hours / Week | Credits : 4 |

I. HTML Programs :

1. **Develop and demonstrate** basic HTML document that illustrate the use of HTML heading, paragraph.
2. **Develop and demonstrate** basic HTML document that illustrate the use of HTML ordered list.
3. **Develop and demonstrate** a HTML document that illustrates the use of HTML Tables.
4. **Develop and demonstrate** a HTML document that illustrates the use of HTML Frames.
5. **Develop and demonstrate** a HTML document that illustrates the use of HTML Forms.

II. DHTML Programs :

1. **Develop and demonstrate** a DHTML document that displays college information using various style sheets.
2. **Develop and demonstrate** a DHTML document that create menus in HTML
3. **Change Background Color at runtime**
4. **That implement 3 types styles (inline, header style and external style file) in a page.**
5. **Show or hide a form at runtime**

III. Javascript Programs :

1. **Design a HTML page** with Javascript to find the area of a rectangle.
2. **Design a HTML page** display clock.
3. **Design a HTML page** with Javascript to count the number of vowels in a text typed in a text area.
4. **Design a HTML page** with Javascript to find the age of a person in completed years.
5. **Design a HTML page** with Javascript to demonstrate prompt and alert box.



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|------------------------|-------------------------------|--------------------------------|
| Part III : CORE | Title : MINI PROJECT | Subject Code : 17MCACV1 |
| Semester : V | Hours : 5 Hours / Week | Credits : 4 |

MINI PROJECT

- 1) Sleeping Barber Problem
- 2) Cigarette Smokers Problem
- 3) Password Retriever Problem
- 4) Leave Management Problem
- 5) Notepad Application
- 6) Loan Management Application
- 7) Chatting Application
- 8) Voice Chatting Application
- 9) Video Chatting Application
- 10) Development of an Online Course Portal for a campus.
- 11) Image Processing-Comparison
- 12) Multithreading Programming Applications



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VI SEMESTER

| S. No | Sub. Code | Subject Title | Hours / Week | Duration of exams | C A | S E | Tot | Credits |
|-------|-----------|--------------------------|--------------|-------------------|-----|-----|-----|---------|
| 1 | 17MCACV2 | Project work & Viva Voce | | | 40 | 60 | 100 | 18 |



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I SEMESTER

| SL. No. | Sub. Code | Nature | Subject Title | Hrs/Week | Exam Hrs | C A | SE | Tot | Crd |
|---------|---------------------------|------------|--|----------|----------|-----|----|-----|-----|
| 1 | 17 PCC C11/ 17 PCE C11 | Core 1 | Advanced Cost Accounting | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17 PCC C12/ 17 PCE C12 | Core 2 | Financial Markets and Services | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17 PCC C13/ 17 PCE C13 | Core 3 | Advanced Accounts | 6 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 PCC C14 | Core 4 | Fundamentals of Information Technology* | 6 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17 PCC E11 | Elective 1 | Computerized Accounting and Office Automation* | 6 | 3 | 25 | 75 | 100 | 5 |
| | | | TOTAL | 30 | | | | | 19 |

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|----------------------------|---|--|
| PART - III CORE | Title : ADVANCED COST ACCOUNTING | Subject Code : 17 PCC C11/ 17 PCE C11 |
| Semester : I | HOURS : 6hours / Week | CREDITS : 3 |

OBJECTIVES:

- To provide information Regarding Accounting Policies.
- To Facilitate Social function Control.

UNIT-I:

Final accounts of sole Trader, Trading account-profit&loss account-Balance sheet, opening entries, closing entries and adjusting entries.

UNIT- II:

Accounting for Non trading organization-meaning of treatment of special items: Single entry, net worth method-conversion method.

UNIT-III:

Branch accounts-accounting in respect of dependent branches including stock & debtors system-independent branches-departmental accounts-departmental transfers-preparation of trading account & profit&loss account and balance sheet.

UNIT-IV:

Insolvency accounts procedure under Insolvency Acts- distinction between insolvency of an individual and partnership firm-preparation of statement of affairs and deficiency accounts of sole trader and partnership firm.

UNIT-V:

Insurance claims-computation of claims to be lodged for loss of stock for loss of profit-average clause. Hire purchase and installment system-accounting-default and repossession-hire purchase trading account-installment purchase-accounting treatment.

TEXT BOOK(S):Advanced Accountancy- T.S.Reddy&A.Murthy

CHAPTERS and SECTIONS (For UNIT-I .12.1 to12.44

UNIT-II 13.1 TO 13.46 UNIT-III 25.1 to 25.47 UNIT-IV 22.1 to 22.47 UNIT V 18.1 to 18.27

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|----------------------------|---|--|
| PART - III CORE | Title : FINANCIAL MARKETS AND SERVICES | Subject Code : 17 PCC C12/ 17 PCE C12 |
| Semester : I | HOURS : 6hours / Week | CREDITS : 3 |

OBJECTIVES:

- It helps to know the present trend of the Financial Markets.
- To aware of the Present Changes and Conditions.

UNIT-I: The Financial System in India – Function of the Financial System – Financial Concepts – Financial Markets –Classification of Markets – Development of Financial System in India – Weaknesses of Indian Financial System.

UNIT-II: Money Market –Meaning –Objectives,Charcteristics and Imporance – Composition of Money Market – Call Money Market, Commercial Bills Market or Discount Market , Acceptance Market and Treasury Bill Market – Money Market InstruMENTS – Commercial Papers, Certificate of Deposite – Deficiency of Indian Money Market – Recent Developments.

UNIT-III: New Issue Market –Meaning – Function –Origination,Underwriting,and Distribution – Methods of Floating New Issues –Public Issue,Offer for Sales, Placement,Bonus Issue and Rights Issues – Recent Trends in New Issue Market – Secondary Market –Control Over Secondary Market – Recognition of Stock Exchanges,,and Registration of Brokers – Depository System – Objectives and Activitives of a aDepository – Benefits of Depository System.

UNIT-IV: Financial Services –Meaning – Scope and Innovation –Causes for Financial Innovation.Merchant Banking – Meaning,Definition and Services of Merchant Banks –Qualities required for Merchant Bankers – Scope for Merchant Banking in India.Mutual Funds – Meaning, Definition and Classification of Funds –Close rndes Funds and Open –endes funds – Merits and Demerits of Mutual Funds – Reasons for Slow Growth of Mutual Fund Industry.

UNIT-V: Credit Rating –Meaning and Definition- Function of Credit Rating –Origin – Credit Rating in India – Benefits – Credit Rating Agencies in India –Credit Rating Information Service Ltd.(CRISIL),Invesment Information and Credit Rating Agencies of India(ICRA), and Credit Analysis and Research(CARE)-SEBI Guide Lines – Limitations of Rating –Future of Rating in India.

TEXT BOOK(S): E.GORDON and K.Natarajan

CHAPTERS and SECTIONS (For UNIT-I 3-27,II-31-66,III-75-121,232-240,IV-250-291,341-373,V-457-471)

REFERENCE BOOKS: Dr.S.Gurusamy,Thomson Business Information India Pvt.Ltd.,India.

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|----------------------------|---------------------------------|--|
| PART - III CORE | Title :ADVANCED ACCOUNTS | Subject Code : 17 PCC C13/ 17 PCE C13 |
| Semester : I | HOURS : 6hours / Week | CREDITS : 4 |

OBJECTIVES:

- To provide information Regarding Accounting Policies.
- To Facilitate Social function Control.

UNIT-I:

Final accounts of sole Trader, Trading account-profit&loss account-Balance sheet,openingentries,closing entries and adjusting entries.

UNIT-II:

Accounting for Non trading organization-meaning of treatment of special items: Single entry,net worth method-conversion method.

UNIT-III:

Branch accounts-accounting in respect of dependent branches including stock & debtors system-independent branches-departmental accounts-departmental transfers-preparation of trading account &profit&loss account and balance sheet.

UNIT-IV:

Insolvency accountsprocedure under Insolvency Acts- distinction between insolvency of an individual and partnership firm-preparation of statement of affairs and deficiency accounts of sole trader and partnership firm.

UNIT-V:

Insurance claims-computation of claims to be lodged for loss of stock for loss of profit-average clause. Hire purchase and installment system-accounting-default and repossession-hire purchase trading account-installment purchase-accounting treatment.

TEXT BOOK(S):Advanced Accountancy- T.S.Reddy&A.Murthy

CHAPTERS and SECTIONS (For UNIT-I .12.1 to12.44

UNIT-II 13.1 TO 13.46 UNIT-III 25.1 to 25.47 UNIT-IV 22.1 to 22.47 UNIT V 18.1 to 18.27

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|----------------------------|---|--------------------------------------|
| PART - III CORE | Title : FUNDAMENTALS OF INFORMATION TECHNOLOGY | Subject Code : 17 PCC C14 |
| Semester : I | HOURS : 6hours / Week | CREDITS : 4 |

OBJECTIVES:

- It helps to Communicate the Information and easiest way of processing Methods.

UNIT-I: Introduction to Computers:- Characteristics of Computers, Classification of Computers, uses of Computers-Classifications of digital Computers: Micro Computers, Mini, Mainframe And Super Computers, network Computers-Anatomy Of Digital Computers: Parts of a Computers- Computer architecture: first electronics Computers, Low level languages, High level languages, Peripheral devices-Number system: binary, decimal to other forms.

UNIT-II: Memory Organization: RAM, ROM- Secondary storage Devices: Classification and advantages- Input Devices-KeyBoard, Mouse, Scanner, Voice recognition, Web cams- Output Devices: Monitor, Printer, Inkjet, Laser and Thermal printers.

UNIT-III: Introduction to Computer software: Hardware and Software interaction, Classification of software, Compilers and interpreters- Programming Languages: Machine Level, Assembly Level, High - Level, types of high level languages, problem oriented languages, natural languages.

UNIT-IV: Introduction to Data Base Management System: information, data and data management, file- based data management-database System, functions of DBMS, benefits and uses of DBMS, - Data Base Design: requirement analysis, information modeling, design constraints.

UNIT-V: Internet and WWW – What is special about internet? internet access, Internet basis, Internet Protocols, Internet Addressing-Email: How EMail, Works, Why use email? Mailing basics, Email ethics and spamming - Computers in Business and Industries: Office Automation, transaction processing, Client/ server system software.

TEXT BOOK(S): Fundamentals of Information Technology – Alexis Leon, Mathews Leon, Leon Techworld, 1999.

CHAPTERS and SECTIONS (For UNIT-I:1.1 to 6.7 UNITII:8.1 to11.12

UNIT III:12.10to12.6 UNIT IV 29.1 to 29.13 UNIT V 33.1 to 33.28

REFERENCE BOOKS: 1.Data Processing,CS.French, Galgotia Book Source,Seventh Edition.

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|--------------------------------|---|--------------------------------------|
| PART - III ELECTIVE | Title :COMPUTER ACCOUNTING AND OFFICE AUTOMATION | Subject Code : 17 PCC E11 |
| Semester : I | HOURS : 6hours / Week | CREDITS : 5 |

OBJECTIVES:

- To maintain the firms Accounts With easy way through Systematic Methods.
- To Provides Multiple Reports in Single Formats.

UNIT-I:

Tally – Installing Tally- Introduction to Tally, Creating a Company –Groups – Ledgers.

UNIT-II:

Cost Categories – Cost Centers –Vouchers in Tally.

UNIT-III:

Inventory Information – Pure Inventory Vouchers – Purchases, Sales Orders – invoices – Reports.

UNIT-IV:

Introduction to Windows – Starting Windows – Managing Files in explorer – Starting Ms Word 2003 – Menus in word – familiarizing with word – Editing the documents – Designing a Documents – Mail Merge.

UNIT-V:

Introduction to Spread sheet – Introduction to Excel 2003 - Working with Excel – Mathematical Calculations – Manipulating data – Simple graph – Ms Power Point 2003.

TEXT BOOK(S): Financial accounting using Tally 6.3, Namrata Agarwal, Dreamtech, First Edition 2000.

CHAPTERS and SECTIONS (For UNIT-I-57-100, II-102-133, III-147-197, IV-45-340, V-351-572)

REFERENCE BOOKS:Mastering Office 2000 Professional Edition,Gini Counter,BPB Publications.

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M.Com.,(COMPUTER APPLICATIONS) - SYLLABUS
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809

II SEMESTER

| SL · No · | Sub. Code | Nature | Subject Title | Hrs/ Wee k | Exam Hrs | CA | S E | Tot | Crd |
|--------------------|---------------------------|---------------|---|------------------|-------------|-----|--------|-----|-----------|
| 1 | 17 PCC C21/ 17 PCE C21 | Core 5 | Customer Relationship Management | 6 | 3 | 25 | 75 | 100 | 3 |
| 2 | 17 PCC C22/ 17 PCE C22 | Core 6 | Management Accounting | 6 | 3 | 25 | 75 | 100 | 3 |
| 3 | 17 PCC C23/ 17 PCE C23 | Core 7 | Banking Technology | 6 | 3 | 25 | 75 | 100 | 4 |
| 4 | 17 PCC C24 | Core 8 | Introduction to Client Server Computing* | 6 | 3 | 25 | 75 | 100 | 4 |
| 5 | 17 PCC E21 | Elective 2 | Programming in Database Management System* | 6 | 3 | 25 | 75 | 100 | 4 |
| 6 | 17 PCC CP1 | | Summer Placement and Practical Training | - | | 100 | | 100 | 1 |
| | | | TOTAL | 30 | | | | | 19 |

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|----------------------------|---|--|
| PART - III CORE | Title : CUSTOMER RELATIONSHIP MANAGEMENT | Subject Code : 17 PCC 21/ 17PCE C21 |
| Semester : II | HOURS : 6hours / Week | CREDITS : 3 |

OBJECTIVES:

- I. To know development in marketing technique
- II. To study the concept of marketing

UNIT-I:

CRM-Meaning-Significance-Reasons for loss of customers-strategies for building relationship-Attention on changing requirements of Customers-developing total care programmers-Strategies for building relationship.

UNIT-II:

Customer acquisition-Meaning-input of acquisition-requisites for effective acquisition-attention on adoption process.

UNIT-III:

Customer Interaction Management(CIM)-Meaning-Routes to CIM-factors influencing CIM-Electronic data interchange(EDI)-Specific Skills for CIM.

UNIT-IV:

e-CRM(e-Customer Relation Management)-Meaning-Evolving e-CRM-CRM vs. e-CRM-need to move to online CRM- Basic Requirements of e-CRM-e-CRM dimensions-Features of e-CRM.

UNIT-V: Integration of CRM WITH ERP(Enterprise Resource Planning)System-Meaning-CRM Integration-Cost-time work Involved-Efficiency-CRM ERP Integration- ERP vendors deal with CRM-Optimum Integration With ERP and CRM via web.

TEXT BOOK(S):Customer Relationship Management – A step by-step approach-H.Peeru Mohammed,A.Sagadevan,Vikas publishing pvt ltd.

REFERENCE BOOKS:1.Alex leon,2005,Enterprise Resource Planning,Tata Mc Grew Hill Publications Company,ltd.,New delhi.

2.Anderson,Kristin,Carol,2003,Cumtomer Relationship.

3.Gosney Roberts,Philips,2003,Relationship Management, Prentice Hall of India.

4.Graham Roberts,Philips,2003,Customer Relationship Management, Viva books Pvt.Ltd., Chennai.

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| | | |
|----------------------------|---|--|
| PART - III CORE | Title :MANAGEMENT ACCOUNTING | Subject Code : 17 PCCC22/ 17PCE C22 |
| Semester : II | HOURS : 6hours / Week | CREDITS : 3 |

OBJECTIVES:

- I. To develop the managerial skill in accounting
- II. To Know about the decision making Concepts

UNIT-I:

Management accounting-meaning-Objectives-Functions-financial Statement analysis-nature-limitations-analysis and interpretation-Comparative Statement-Commend Size Statement-trend analysis.

UNIT-II:

Working. Capital-Meaning- impotence-advantages-types-Gross Working Capital-Net working Capital-Working Capital Cycle-Estimation of Working Capital required.

UNIT-III:

Funds flow Statement-Impotence-Limitations-Predation of Schedule of changes in Working capital-Calculation of funds from operations-Cash flow statement-Importance-Limitations-Computation of cash from operations-Preparations of cash flow statement.

UNIT-IV:

Marginal costing-definition-features-merits and demerits-fixed cost-variable cost-contributions-break-even point-margin of safety-profit volume ratio-Cost-Volume profit analysis-applications of Marginal Costing.

UNIT-V:

Standard costing-definition-advantages-limitations-Variiances-materials,Labour,Overheads and Sales variances.

TEXT BOOK(S):Management accounting-T.S. Reddy& Y. Hari Prasad Reddy
Management accounting-Rama chandran & Srinivasan.

REFERENCE BOOKS: Management accounting- M.Y .Khan & P.K. Jain
Management accounting- R.K. Gupta
Management accounting- N.K. Kalshresthar
Management accounting- R.K. Antheny.

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| | | |
|----------------------------|--------------------------------------|---|
| PART - III CORE | Title :BANKING TECHNOLOGY | Subject Code : 17 PCC C23/ 17PCE C23 |
| Semester : II | HOURS : 6hours / Week | CREDITS : 4 |

OBJECTIVES:

- To develop the managerial skill in accounting
- To Know about the decision making Concepts

UNIT-I: BANKING TECHNOLOGY: Introduction-Evolution-Concept-computers and computerizations-Introduction-Technology adoption in banks-Classification of computers-computer Languages.

UNIT-II: NETWORK AND NETWORKING ::Server-meaning-Types. Network –meaning-Topology-components. Types-Natives in India and Abroad-Bank Net, RBINTET, Data Net ,INET Bank Branch Network.

UNIT-III: COMPUTERIZED BANKING: Internet banking-Features-Regulations and control-Products and services – Levels of internet banking-Core Banking-Any where Banking-Anytime Banking-Mobile Banking.

UNIT-IV: ELECTRONIC FUND TRANSFER; ATM-Debit Card-Credit Cards-Smart Cards-Prepaid payment instruments-Emerging Technologies and Application-E-Payments-Advent ages-Channels-Payment Gateways-ECS-NEFT-RTGS-Other information technology enabled services.

UNIT-V: DATA MANAGEMENT AND SECURITY: Data Management-Organisation-Types-DBMS-Functions-Utility-Structures-Models-Decision support Resources-Data Base Administrator(DBA)-functions-kObjectives-Data engine-Risks and security-Regulation-RBI,Guidelines-Security standards-Risks-Typesw-Cryptography-Digital Signatures-Physical Security-Regulation-RBI Guidelines-Security Standards-Risks-Types-Cryptography-Digital Signatures-Physical Security-Cyber Attach-Cyber Law..

TEXT BOOK(S):1. Banking Technology Dr. A. Rama new century Book House (P) LTD Chennai..
 2. Dr. A. A Arunadevi Technology is banking C.S.Ram and S.Arunajotesam Margham Publication Chennai.

REFERENCE BOOKS Banking Theory Law and Practice Dr. S.Gurusamy Vinay article imprint(p)ltd Chennai.
 Electronic Banking and information Technology IIB Computer Network Archrews S

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|----------------------------|--|----------------------------------|
| PART - III CORE | Title : INTRODUCTION TO CLIENT SERVER COMPUTING | Subject Code : 17 PCC C24 |
| Semester : II | HOURS : 6hours / Week | CREDITS : 4 |

OBJECTIVES:

- To develop the managerial skill in accounting
- To Know about the decision making Concepts

UNIT-I:

Introduction- The Business Opportunity- Driving Forces in the 1990s- Major Issue of the 1990- Client/server computing.

UNIT-II :

Advantages of client/Server computing-Technology revolutions- connectivity-Ways to improve performance –Reduce Network traffic – faster delivery systems.

UNIT-III:

Components of Client/Server Application-The Client: Role of the Client-Client services-Request of services

UNIT-IV:

Components of Client/Server application-The Server: Role of the Server-Server functionality- Network Operating System-Server operating System.

UNIT-V:

Client/Server system Development-Software Factors of driving demand-need for Improve technology-need for platform migration-client/server development methodology-Architecture definition.

TEXT BOOK(S):Client/Server computing, Patrick N. Smith, Steven L.guengerich, second Edition ,Prentice-Hall of India,2002, Chapter 1-4,6

REFERENCE BOOKS: Client/Server Computing Dawn Travis Dewire, Mc Graw Hill, International, Edition 1994

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|--------------------------------|---|----------------------------------|
| PART - III Elective | Title :PROGRAMING IN DATA BASE MANAGEMENT SYSTEM | Subject Code : 17 PCC E21 |
| Semester : II | HOURS : 6hours / Week | CREDITS : 4 |

OBJECTIVES:

- I. To Know the technological concepts in banking.
- II. To introduce the new banking concepts in the modern world.

UNIT-!:

Introduction to Database: Defining a database- Understanding of RDBMS of objects of a Relational Database- Macros-Functions of DBMS.

UNIT-II

understanding Database- Creating a database, creating a table, Working in tables, defining primary key, saving and closing the table-Opening a table, Modifying table, selecting a field and multiple field, editing records in a table-printing the table- creating relationship between tables.

UNIT-III:

Forms: Creating a Form- changing the view of the form-Moving through the records-adding a new fields- changing the name of the field-editing a record from the from-renaming the form.

UNIT-IV:

Queries: Creating a query on a table- Sorting records-hiding and unhanding a field a field-setting and deleting criterion-reforming calculations-saving and closing a query.

UNIT-V:

Reports: Generating Reports with repots Wizard-closing the reports
 TEXT BOOK(S): Comdex computer courses Kit, Visas Gupta,
 Dreamtech,2003,Chapters:Access 1-6

REFERENCE Access for windows 95 Bible, Cary N. Prague, Michael R . Irwin, Comdex, First Edition, 1995.

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|--------------------------------------|---|----------------------------------|
| PART - III Elective | Title :SUMMER PLACEMENT AND PRACTICAL TRAINING | Subject Code : 17 PCC EP1 |
| Semester : II | HOURS : 6hours / Week | CREDITS : 1 |

OBJECTIVES: I. To develop the managerial skill in accounting
 II. To Know about the decision making Concepts

Six Weeks summer placement and practical training is compulsory for successful completion of the M.COM.(CA) course. The practical training is essential to expose the students to the real life work situation and to strengthen the conceptual knowledge gained in the class room. The practical training shall be in a banking, financial institution, industrial enterprise or consultancy organization.

Every candidate should submit a report at the end of the study. The principal of the College and head of the Department shall issue a certificate to the effect that the student had satisfactorily undergone the practical training for the prescribed period. The hundred marks for summer placement practical training shall be in the ratio of 50 marks for training report and 50 marks for Viva-voce examination by internal staff.

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III SEMESTER

| SL · No · | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | C A | S E | Tot | Crd |
|--------------------|------------------------|---------------|---|--------------|-------------|--------|--------|-----|-----------|
| 1 | 17PCEC31/ 17PCC C31 | Core 9 | Overseas Marketing | 6 | 3 | 25 | 75 | 100 | 5 |
| 2 | 17PCEC32/ 17PCC C32 | Core10 | Advanced Company Accounts | 6 | 3 | 25 | 75 | 100 | 5 |
| 3 | 17PCCC33 | Core11 | Web Designing and Internet* | 6 | 3 | 25 | 75 | 100 | 5 |
| 4 | 17PCCEP1 | Elective 3 | Web Designing and Internet – Lab* | 6 | 3 | 40 | 60 | 100 | 5 |
| 5 | 17PCCN31/ 17PCEN31 | NME 1 | Tourism Development | 6 | 3 | 25 | 75 | 100 | 5 |
| | | | Total | 30 | | | | | 25 |

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|----------------------------|---------------------------------------|--|
| PART - III CORE | Title : OVERSEAS MARKETING | Subject Code : 17 PCC 31/ 17PCE C31 |
| Semester : III | HOURS : 6hours / Week | CREDITS : 5 |

OBJECTIVES:

- I. To Understand the Concepts of International Marketing.
- II. To enrich the Knowledge of International business.

UNIT-I:

International Marketing-Definition-Scope of Overseas marketing-International Marketing Vs Domestic Marketing-Objectives of International Business-Export procedures and document-Foreign Trade (Development and Regulation) Act, 1992-Main provisions.

UNIT-II:

Overseas Market Entry and overseas distribution system-Direct Exporting-Indirect Exporting-Forms of direct exporting-Forms of organization in foreign markets-Export Distribution channel-Foreign Market Entry New Strategies-Counter trade-Licensing-Third Country location-Mergers and Acquisition-Strategic Alliance.

UNIT-III:

Overseas Product Strategies-Product Communication strategies-Straight Extension, product extension, product Adaptation, Dual Adaptation, Product Invention-Branding-Branding problems in International Marketing-Packaging and Labeling-Special Consideration in International packaging-Pricing Strategies-Pricing methods-Step in pricing-Retrograde pricing-Transfer Pricing-Dumping-Export price Quotations.

UNIT-IV:

Overseas Distribution logistics for exports-Promoting products internationally-management of risks in international marketing.

UNIT-V:

Overseas(International)Trade Financing-Institutional finance for export-forfeiting-Letter of Credit-types-EXIM Bank-Export Credit Risk Insurance-ECGC-Quality control-Objectives-Role of Bureau of Indian Standards-The Foreign Exchange Management Act-Objectives-main Provisions.

TEXT BOOK(S):1.Francis Cherunilam-International Business, Prentice Hall. New Delhi

2.L.E.Varsheny&B.Bhattachary-International Marketing, Sultan Chand-New Delhi

Books for reference:

1.International Marketing-P.KVasudeva,Excel Books,New Delhi.

2.International Marketing-V.H.Kirpalani,Prentice Hall of India PVT Ltd,New Delhi.

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|----------------------------|--|---|
| PART - III CORE | Title : ADVANCED COMPANY ACCOUNTS | Subject Code : 17 PCC C32/ 17PCE C32 |
| Semester : III | HOURS : 6hours / Week | CREDITS : 5 |

OBJECTIVES:

- I. To Know the Significance of Accounting Standards.
- II. To gain the Knowledge of latest Company Act.
- III. To apply the latest laws into Problems.

UNIT-I:

Accounting Standards: Meaning-Objectives-need-Significance-Accounting Standard Board(ASB):Formation-functions—Scope Indian Accounting Standards:AS-1 Disclosure of Accounting Policies-AS-2(REVISED) Valuation of inventories-AS-10 Accounting for Fixed Assets-AS-13 Accounting for Investments’.

UNIT-II:

Company Final Accounts including managerial remuneration Computations-Valuation of Goodwill-methods-Valuation of shares-methods.

UNIT-III:

Underwriting of Shares including firms underwriting-Accounts of holding and subsidiary companies-Calculations of Goodwill/Capital reserve, minority interest, Consolidated Balance Sheet.

UNIT-IV :

Final Accounts of Banking Companies(New format)-Accounting for Price level changes-Human Resource Accounting-Objectives.

UNIT-V:

Account of Insurance Companies of Life, Fire and Marine-Social responsibility Accounting-meaning-importance.

TEXT BOOK(S):1. Corporate Accounting, T.SREDDY & A.Murthy

Books for Reference:1. Advanced Company Accounts, R.L.Gupta & Radhaswamy.
 2. .Advanced Company Accounts, M.C.Shukla & T.S.Graval.
 3. .Advanced Company Accounts, S.P.Jain & k.l.Narang.

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|----------------------------|---|----------------------------------|
| PART - III CORE | Title : WEB DESIGNING AND INTERNET | Subject Code : 17 PCC C33 |
| Semester : III | HOURS : 6hours / Week | CREDITS : 5 |

OBJECTIVES: I. To develop the managerial skill in accounting
 II. To Know about the decision making Concepts

UNIT-I: Internet basic : Introduction- Meaning of internet- History and development of the internet- Introduction to the world wide web- Acronyms and terms- What makes the WWW work? Uniform resource locators or URLs-WWW clients or “Browsers”- The client server model- Electronic mail- Reading on internet address-Advantages and disadvantages of the internet.

UNIT-II: HTML: Introduction to HTML-Elements in HTML documents- empty elements-HTML tags- HTML basic- HTML elements-Nested HTML elements- empty HTML elements- HTML headings- HTML rules (lines)- HTML paragraphs- HTML line break- unordered lists- Definition lists, HTML Tables: Table attributes.

UNIT-III Introduction to Java Script : Meaning of java script operators :- arithmetic operators – assignment operators –The + operators used on strings – adding strings and numbers – control statements – If else statement – Switch statement – pop up boxes – functions – the lifetime of java script variables – loops – forIn statement.

UNIT-IV Objects, Methods and events in Java Script : Create object properties – date object methods – creating your own objects – window object – Window object collections – Window object methods – Window alert () Method – window close() method window confirm () method window open() method-window prompt (0 method Events in Java Script: Java scripts events – on load and on unloads – on focus, on Blur and on change – on mouse out – java script try Catch statement –java script the on error event.

UNIT-V: Introduction and concepts of PHP: PHP- using variables in PHP – issues concerning creating variables ,defined constraints ,-PHP operators types ,PHP expressions, arrays, accessing PHP and HTTP data – predefined variables, variable in HTTP Request and Response ,super Global arrays. Designing PHP program logic:-problem statement, Writing Pseudo code, Boolean Logic, Condition or Branching Statement –IF statement ,Switch statement, Loops and Arrays-Writing user-defined functions in PHP – Structure of functions, Switching Function, Inside Functions. Scope of variable: - Global and Local Variables, Creating Static Function Variable , Nesting , Recursion .

Text Books: 1. Beginning PHP 5.0, Author: Dave. W. Mercer, Willie, Allankenet Stephen D. Nowicki, David Mercer Dan Savvier , Wainkyu Thoi, Dreamtech publications.
 2. INTERNET AND WEB DESIGNING , Author : S . Senthilkumar , M.E., B.P.J. Engg. College Shri. Mushnam , Cuddalore -608703 , shalax publications.

Reference Book: Web Programming Gray Cornell.

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| | | |
|--------------------------------|---|----------------------------------|
| PART - III ELECTIVE | Title : WEB DESIGNING AND INTERNET LAB | Subject Code : 17 PCC EP1 |
| Semester : III | HOURS : 6hours / Week | CREDITS : 5 |

OBJECTIVES: I. To develop the managerial skill in accounting
 II. To Know about the decision making Concepts

HTML:

- To create a mark sheet for the student by using HTML tables tags.
- To create a Time Table in HTML
- To create a Marquee in HTML
- Web page creation using HTML Tags
- Create Google page in HTML

PHP:

- To create a program for bank accounts processing using window application in PHP using database.
- To create a program for employee pay bill processing using windows application in PHP with database connection.
- To create a program for maintaining electricity bill using window application in PHP using database connection.
- To create a program for student mark sheet processing using window applications in PHP using data controls.

Java script lab:

- To create a program for generating Fibonacci series using Java Script.
- To create a program for finding the sum of digits in Java Script
- To create a program for mark sheet processing Java Script
- To create the login using windows applications in Java Script
- To create a form for login and data from by using Java Script

REFERENCE BOOKS: Web Programming Gray Cornell

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|-----------------------|------------------------------|---------------------------------|
| PART - IV | Title : TOURISM | Subject Code : 17PCCN31/ |
| NME | DEVELOPMENT | 17PCEN31 |
| Semester : III | HOURS : 6hours / Week | CREDITS : 5 |

OBJECTIVES: I. To develop the managerial skill in accounting
 II. To Know about the decision making Concepts

UNIT-I:

GROTH OF TOURISM:

Introduction-Meaning- Nature of tourism-Elements & tourism-An ancient phenomenon, Account of famous travelers-The Grand Tour-Paid holidays-Types of tourism.

UNIT-II:

Tourism in India

A land for all seasons – Development of Tourism – India – the formation of the ministry of Tourism – setting up of the development of Tourism.

UNIT-III:

Tourism Marketing

Marketing in Tourism –The Tourist product – Tourist market – market segmentation – Marketing process and functions.

UNIT-IV :

Tourism Promotion

Advertising – sales support –public relations –Tourist Publicity – Evolution and modern trends.

UNIT-V :

International Organization & Tourism

International union of official travel organization (IUOTO), WTO-PATA-IATA-ICAO- constitution – objectives – services.

TEXT BOOK(S):Tourism Development- A.K. Bhatia

REFERENCE BOOKS: Tourism Development – R.ABBAS

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IV SEMESTER

| SL. No. | Sub. Code | Nature | Subject Title | Hrs/ Week | Exam Hrs | C A | SE | Tot | Crd |
|---------|------------------------|--------|--|-----------|----------|-----|----|-----|-----------|
| 1 | 17PCEC41/ 17PCC C41 | Core12 | Financial Management | 6 | 3 | 25 | 75 | 100 | 6 |
| 2 | 17PCEC42/ 17PCC C42 | Core13 | Strategic Management | 6 | 3 | 25 | 75 | 100 | 6 |
| 3 | 17PCEC43/ 17PCC C43 | Core14 | Executive Communication | 6 | 3 | 25 | 75 | 100 | 5 |
| 4 | 17PCCC44 | Core15 | Enterprise Resource Planning* | 6 | 3 | 25 | 75 | 100 | 5 |
| 5 | 17PCCCV1 | Core16 | Computer Application Oriented Project* | 6 | - | - | - | 100 | 5 |
| | | | Total | 30 | | | | | 27 |

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| | | |
|----------------------------|---|---|
| PART - III CORE | Title : FINANCIAL MANAGEMENT | Subject Code : 17 PCC C41/ 17PCE C41 |
| Semester : IV | HOURS : 6hours / Week | CREDITS : 6 |

OBJECTIVES: I. To Understand the concepts of Financial Management
 II. To gain the technical knowledge in Financial Management

UNIT-I: Financial management-Introduction, definition, nature, scope and objectives, key objectives of financial management- financial function- approaches of financial functions-types of financial decision-functions of finance manager-organization of finance section.

UNIT-II: Working capital management- introduction, definition, classification-dangers of inadequate capital and excess capital-Determinants of working capital- computation of working capital- working capital financing-trade credit- Bank Credit- Advances- factoring-commercial paper- installment credit.

UNIT-III: Capital budgeting – Introduction-significance-capital Budgeting process-Factors affecting capital Investment Decision-Principles and techniques-Pay Back Method-Discount cash flow method-Net present value method-Average rate of return method-Internal rate of return- Profitability Index method.

UNIT-IV: Financing Decision-Introduction-Capital structure-factors influencing financial decisions-Theories of capital structure-capital Gearing-Financial leverage and operating leverage. Cost of capital-Meaning, Definition, and Importance-Computation of cost of equity and cost of debt.

UNIT-V: Dividend and Dividend policy-Introduction, classification, sources of dividend-factors influencing dividend policy theories of dividend decision-Irrelevance and relevance theory- Walter's model only-Generally accepted dividend policies.

TEXT BOOK(S):Dr. S. N. Maheshwari, Financial Management-Principles and practice, Sultan Chand Publishers.

REFERENCE BOOKS: 1. I.M.Pandey, financial Management, Kalyani Publishers.
 2. Shashi.K.Gupta. R.K.Sharma, Financial Management, Kalyani Publishers.
 3 Khan & Jain Financial Management-Tata McGraw Hill.
 4.Ravi & M. Kishore Financial Management-Taxman..

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| | | |
|----------------------------|---|--|
| PART - III CORE | Title : STRATEGIC MANAGEMENT | Subject Code : 17 PCC 42/ 17PCE C42 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 6 |

OBJECTIVES: I. To Understand the concepts of strategic management
 II. To enrich the knowledge of features of strategic management

UNIT-I: Business system:

Nature and scope of modern business-characteristics of business-objectives- difference between objectives and goals-objectives setting and guidelines-Definitions and meaning of strategy and strategic management-Difference between strategy and tactics-levels of strategy.

UNIT-II Environmental Scanning

Environmental scanning-its approach-gathering information for environmental analysis-SWOT analysis.

UNIT-III: Strategy Formulation:

Strategy formulation and choice of Alternatives, strategic Alternatives-Strategic Alternatives-Stability strategy its variants-Expansion or Growth Strategy, its types-Retrenchment-Strategy, Form of adopting Retrenchment Strategy-Combination strategy.

UNIT-IV: Strategy Implementation:

Definition- MC Kinsey's model,-Inter-relationship between formulation and implementation of strategy-issue in implementation-Structural Implementation and Organization structure-Entrepreneurial structure-Functional structure-Divisional Structure-Behavioral, Functional and operational implementation.

UNIT-V: Strategy evaluation and control:

Process Evaluation-Elements in process of evaluation-Barriers-Requirements-Types of strategic control.

TEXT BOOK(S):1.Strategic management-Dr. S. Sankaran

2. Strategic management-D.V. Balu, Sri Venkateswara publications

REFERENCE BOOKS: 1.: Strategic management-P.k.Ghosh&Azon Kazwa.

2.Cases in strategic management-Budhiraja S.B.and Athreya
 M.B.,Tata Mc-Graw Hill, new Delhi.

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SOURASHTRA COLLEGE, MADURAI- 625004

(An Autonomous Institution Re-accredited with 'B' grade by NAAC)

M.Com.,(COMPUTER APPLICATIONS) - SYLLABUS

(Under CBCS w.e.f. 2017 – 2018 onwards)

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|----------------------------|--|---|
| PART - III CORE | Title : EXECUTIVE COMMUNICATION | Subject Code : 17 PCC C43/ 17PCE C43 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 5 |

OBJECTIVES: I. To develop the managerial skill in accounting.
II. To Know about the decision making Concepts.

UNIT-I: Executive Communication – Meaning – Elements, objective, process of executive communication –Directions of executive communication-Downward, upward, horizontal, diagonal-Channels of communication-Formal and informal communication-Essentials of effective writing –layout of a business Letter-Non-verbal communication-Merits and demerits of each-Body language-Paralanguage-Tele-Conferences-Websites.

UNIT- II: Personnel Executive's communication-Job application with curriculum vitae-drafting interview letters, Making enquiries about appointment, confirmation, promotion. Warring memo-Letter of appreciation-Letter of sympathy-Invitations to speak in meeting, seminars and conferences-Replay letters.

UNIT-III: Sales Executive's Letters-Features-Personalized sales promotion letters-introducing new products-Festival offers-Follow-up letters-Circulars to sales force-information sales targets, prizes, meetings, overseas trips-Sales promotion through tele-Shopping, mobile.

UNIT-IV: Company secretary's Correspondence, Notice for a meeting- Agenda –Conduct of meeting – minutes – Resolution – Correspondence with directors, shareholders and government officials – Business communication in a Hi- tech environment – Fax, computers, Internet, e-mail ID, advantages and limitations.

UNIT-V: Executive Report writing – Report as a Communication tool – necessity of reports – kinds of executive reports – Progress reports – Guidelines to be followed to make a report effective.

Text Books: 1. Raghunathan N.S. & Santhanam B. – “Business Communication”, Margham Publications, T.Nagar, Cheenai.

REFERENCE BOOKS: 1.WOOL COTT & UNWIN – Mastering “Business Communication”, MC Millan.
2.Rajendrapaul and Korlahalli – “Business Communication”.
3.”Basic Business Communication” Lesikar and Flately: T.M.H Public, New Delhi.

Passed in the BOS Meeting
held on 15-3-2017

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|----------------------------|---|----------------------------------|
| PART - III CORE | Title : ENTERPRISE RESOURCE PLANNING | Subject Code : 17 PCC C44 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 5 |

OBJECTIVES: I. To Create Data base and Maintain database
II. To Manage Database Work and Cost of Management

UNIT-I:

ERP overview-benefits of ERP-ERP- and related technologies-Business process Reengineering (BPR)-Data warehousing-Data Mining Online analytical processing-supply chain management.

UNIT-II:

ERP Implementation: ERP implementation life cycle-Implementation methodology-ERP Implementation -The Hidden costs.

UNIT-III:

Organizing the Implementation-Vendors, consultants and user-contracts with vendors, consultants and employees-project management and monitoring.

UNIT-IV:

Business Module in an ERP package-finance-manufacturing-Human Resource-Plant maintenance-Material Management.

UNIT-V:

Manufacturing Module-Capacity planning-Shop floor control-Quality management-JIT-Cost management-Market Modules-Sales and Distribution.

TEXT BOOK(S):ERP demystified, Alexis Leon Tata Mc Graw hill publishing company,2000.Chapters:1-35

REFERENCE BOOKS 1.:Enterprise Resource Planning, Vinod kumar Garg, Venkitakrishnan, prentice hall of india,2002
2.S.Ramachandran,Air Wick publicatons2004

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| | | |
|----------------------------|--|--------------------------------------|
| PART - III CORE | Title : COMPUTER APPLICATION ORIENTED PROJECT | Subject Code : 17 PCC CV1 |
| Semester : IV | HOURS : 6 hours / Week | CREDITS : 5 |

OBJECTIVES: I. To develop the managerial skill.
II. To Know about the decision making Concepts.

COMPUTER APPLICATION ORIENTED PROJECT

Project work is compulsory and it carries 100 marks. A student should select a topic for project work in the third semester itself and submit the project report at the end of the fourth semester. The project report shall be valued by an external examiner as an examination for 100 marks.

Passed in the BOS Meeting
held on 15-3-2017

Signature of Chairman/HOD



SOURASHTRA COLLEGE, MADURAI- 625004
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QUESTION PATTERN – EXTERNAL EXAMINATIONS
(Under CBCS w.e.f. 2017 – 2018 onwards)

828

PART-I : TAMIL/HINDI/SANSKRIT

QUESTION PATTERN

Time: 3 Hours

Max: 75 Marks

SECTION – A (4 X 5 = 20 MARKS)

I. Answer all the questions:

- a. Fill up the blanks
- b. Question Answer
- c. Match the following
- d. Choose the best answer

SECTION – B (5 X 5 = 25 MARKS)

II. Answer all the questions:

Either /Or Pattern

SECTION – C (3 X 10 = 30 MARKS)

III. Answer any THREE questions:

Open Choice



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QUESTION PATTERN – EXTERNAL EXAMINATIONS
(Under CBCS w.e.f. 2017 – 2018 onwards)

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PART-II : ENGLISH QUESTION PATTERN

Time: 3 Hours

Max: 75 Marks

PART-I – 20 Marks (From UNIT- I)

- IV. Answer any **TWO** of the following in about 100 words each
(2 out of 3) $2 \times 5 = 10$
- V. Answer any **ONE** of the following in about 250 words
(1 out of 2) $1 \times 10 = 10$

PART-II – 20 Marks (From UNIT- II)

- I. Answer any **TWO** of the following in about 100 words each
(2 out of 3) $2 \times 5 = 10$
- II. Answer any **ONE** of the following in about 250 words
(1 out of 2) $1 \times 10 = 10$

PART-III – 15 Marks (From UNIT- III)

- I. Fill in the blanks and/or identify the grammatical items /
Rewrite as directed (5 questions) $5 \times 1 = 5$
- II. Change as directed (5 questions) $5 \times 2 = 10$

PART-IV – 10 Marks (From UNIT- IV)

- I. Answer the following (Either or type) (2 questions) $2 \times 5 = 10$

PART-V – 10 Marks (From UNIT- V)

- I. Answer **TWO** of the following (Open choice – 2 out of 3) $2 \times 5 = 10$



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QUESTION PATTERN – EXTERNAL EXAMINATIONS
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UG COURSES

PART III : (CORE, ALLIED, ELECTIVE) - QUESTION PATTERN

SECTION – A (COMPULSORY)

Ten Questions (Answer all questions)(Two questions from each unit) **10 X 2 = 20 Marks**

SECTION – B (INTERNAL CHOICE)

Five Questions (Either...Or type) **5 X 5 = 25 Marks**

Answer all questions choosing either (a) or (b) (One question from each unit)

SECTION – C(OPEN CHOICE)

Answer any **THREE** questions out of **FIVE** **3 X 10 = 30 Marks**

One question from each unit.

PART- IV : (SBS, NME, VE, EVS) - QUESTION PATTERN

SECTION – A (OPEN CHOICE)

Answer any **FIVE** questions out of **EIGHT** **5 X 5 = 25 Marks**

Not exceeding Two questions from each Unit

SECTION – B (INTERNAL CHOICE)

Five Questions (Either...Or type) **5 X 10 = 50 Marks**

Answer all questions choosing either (a) or (b)(One question from each unit)



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QUESTION PATTERN – EXTERNAL EXAMINATIONS
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831

PG COURSES

PART III : (CORE, ELECTIVE) - QUESTION PATTERN

SECTION – A (COMPULSORY)

Five Questions (Answer all questions)(One question from each unit) **5 X 3 = 15 Marks**

SECTION – B (INTERNAL CHOICE)

Five Questions (Either...Or type) **5 X 6 = 30 Marks**

Answer all questions choosing either (a) or (b) (One question from each unit)

SECTION – C(OPEN CHOICE)

Answer any **THREE** questions out of **FIVE** **3 X 10 = 30 Marks**

One question from each unit.

PART-IV : NME - QUESTION PATTERN

SECTION – A (OPEN CHOICE)

Answer any **FIVE** questions out of **EIGHT** **5 X 5 = 25 Marks**

Not exceeding Two questions from each Unit

SECTION – B (INTERNAL CHOICE)

Five Questions (Either...Or type) **5 X 10 = 50 Marks**

Answer all questions choosing either (a) or (b)(One question from each unit)



Ratifications

1. Department of Chemistry

Dr.C.R.Yuvarajan, The Chairman, BOS of Chemistry has moved the following ratifications before the Academic Council for approval.

Respected Chairman, Honorable Nominees, My dear Fellow Colleagues, Ladies and Gentlemen,

- i. 14UCYMP4 – Core Practical – Organic Analysis is to be removed from V Semester and to be included in the VI semester. [**15UCYMP6**]
- ii. 14UCYMP6 - Core Practical – Organic Estimation and Organic Preparation is to be removed from VI Semester and to be included in the V semester. [**15UCYMP4**]
- iii. 14UCYE61 – Elective – Chemistry of Biomolecules – Some topics mentioned in the units are to be interchanged among one another for the benefit of the students. [**15UCYE61**]

2. Department of MCA

Mr.BharaniSethupandian, The Chaiman, BOS of MCA, has moved the following ratification before the Academic Council for approval.

Respected Chairman, Honorable Nominees, My dear Fellow Colleagues, Ladies and Gentlemen,

The special BOS meeting of MCA was held on 15th JULY 2016 to discuss the exemption of first year papers for MCA-Lateral Entry students who are admitted in the year 2013-14. The BOS has given the following recommendations to be placed in the Academic Council for approval.

- i. To provide exemption of first year papers for MCA-Lateral Entry students who are admitted in the year 2013-14.
- ii. The BOS also suggests to implement the norms given by the MKU for 2014-15 MCA(Lateral Entry) batch may be applied to the 2013-14 MCA(Lateral Entry) batch also.