Amrita University's Amrita Values Programme (AVP) is a new initiative to give exposure to students about richness and beauty of Indian way of life. India is a country where history, culture, art, aesthetics, cuisine and nature exhibit more diversity than nearly anywhere else in the world.

Amrita Values Programmes emphasize on making students familiar with the rich tapestry of Indian life, culture, arts, science and heritage which has historically drawn people from all over the world.

Students shall have to register for any two of the following courses, one each in the third and the fourth semesters, which may be offered by the respective school during the concerned semester.

Courses offered under the framework of Amrita Values Programmes I and II

Message from Amma's Life for the Modern World
Amma's messages can be put to action in our life through pragmatism and attuning of our thought process in a positive and creative manner. Every single word Amma speaks and the guidance received in on matters which we consider as trivial are rich in content and touches the very inner being of our personality. Life gets enriched by Amma's guidance and She teaches us the art of exemplary life skills where we become witness to all the happenings around us still keeping the balance of the mind.

Lessons from the Ramayana
Introduction to Ramayana, the first Epic in the world – Influence of Ramayana on Indian values and culture – Storyline of Ramayana – Study of leading characters in Ramayana – Influence of Ramayana outside India – Relevance of Ramayana for modern times.

Lessons from the Mahabharata
Introduction to Mahabharata, the largest Epic in the world – Influence of Mahabharata on Indian values and culture – Storyline of Mahabharata – Study of leading characters in Mahabharata – Kurukshetra War and its significance - Relevance of Mahabharata for modern times.

Lessons from the Upanishads
Introduction to the Upanishads: Sruti versus Smrti - Overview of the four Vedas and the ten Principal Upanishads - The central problems of the Upanishads – The Upanishads and Indian Culture – Relevance of Upanishads for modern times – A few Upanishad Personalities: Nachiketas, Satyakama Jabala, Aruni, Shvetaketu.

Message of the Bhagavad Gita

Life and Message of Swami Vivekananda

Life and Teachings of Spiritual Masters India
Sri Rama, Sri Krishna, Sri Buddha, Adi Shankaracharya, Sri Ramakrishna Paramahamsa, Swami Vivekananda, Sri Ramana Maharshi, Mata Amritanandamayi Devi.

Insights into Indian Arts and Literature
The aim of this course is to present the rich literature and culture of Ancient India and help students appreciate their deep influence on Indian Life - Vedic culture, primary source of Indian Culture – Brief introduction and appreciation of a few of the art forms of India - Arts, Music, Dance, Theatre.

Yoga and Meditation
The objective of the course is to provide practical training in YOGA ASANAS with a sound theoretical base and theory classes on selected verses of Patanjali’s Yoga Sutra and Ashtanga Yoga. The coverage also includes the effect of yoga on integrated personality development.

Kerala Mural Art and Painting
Mural painting is an offshoot of the devotional tradition of Kerala. A mural is any piece of artwork painted or applied directly on a wall, ceiling or other large permanent surface. In the contemporary scenario Mural painting is not restricted to the permanent structures and are being done even on canvas. Kerala mural paintings are the frescos depicting mythology and legends, which are drawn on the walls of temples and churches in South India, principally in Kerala. Ancient temples, churches and places in Kerala, South India, display an abounding tradition of mural paintings mostly dating back between the 9th to 12th centuries when this form of art enjoyed Royal patronage. Learning Mural painting through the theory and practice workshop is the objective of this course.

Course on Organic Farming and Sustainability
Organic farming is emerging as an important segment of human sustainability and healthy life. ‘Haritamritam’ is an attempt to empower the youth with basic skills in
tradition of organic farming and to revive the culture of growing vegetables that one consumes, without using chemicals and pesticides. Growth of Agriculture through such positive initiatives will go a long way in nation development. In Amma’s words “it is a big step in restoring the lost harmony of nature”.

Benefits of Indian Medicinal Systems
Indian medicinal systems are one of the most ancient in the world. Even today society continues to derive enormous benefits from the wealth of knowledge in Ayurveda of which is recognised as a viable and sustainable medicinal tradition. This course will expose students to the fundamental principles and philosophy of Ayurveda and other Indian medicinal traditions.

Traditional Fine Arts of India
India is home to one of the most diverse Art forms world over. The underlying philosophy of Indian life is “Unity in Diversity” and it has led to the most diverse expressions of culture in India. Most art forms of India are an expression of devotion by the devotee towards the Lord and its influence in Indian life is very pervasive. This course will introduce students to the deeper philosophical basis of Indian Art forms and attempt to provide a practical demonstration of the continuing relevance of the Art.

Science of Worship in India
Indian mode of worship is unique among the world civilisations. Nowhere in the world has the philosophical idea of reverence and worshipfulness for everything in this universe found universal acceptance as it in India. Indian religious life even today is a profound demonstration of the potential for realisation of this truth. To see the all-pervading consciousness in everything, including animate and inanimate, and constituting society to realise this truth can be seen as the epitome of civilizational excellence. This course will discuss the principles and rationale behind different modes of worship prevalent in India.

15BUS102 INTRODUCTION TO MANAGEMENT 1001

Objectives: The objective of this course to enable the students to have a basic knowledge of principles of management.

Unit 1
Management: meaning and definition.

Unit 2
Importance of management, administration and management.

Unit 3
Functional management.

SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 4
Functions of management.

Unit 5
Levels of management.

TEXTBOOK:
Dinkar Pagare – Principles of Management, Sultan Chand and Sons

REFERENCE:
VSP Rao, V. Hari Krishna – Management Text and Cases, Excel Books

15COM216 PRINCIPLES OF ACCOUNTING 2002

Objective: The objective of this course to enable the students to have a basic knowledge of theoretical and practical aspects of various systems of accounting.

Unit 1
Financial Accounting: Meaning and important terms, accounting concepts, double entry book keeping, types of accounts, journal, ledger, trial balance.

Unit 2
Final Accounts: Preparation of Trading and Profit and Loss Accounts and Balance Sheet, adjustments relating to outstanding expenses, prepaid expenses, accrued income unearned income, depreciation and bad and doubtful debts.

Unit 3
Cost Accounting: Meaning and Definition, elements of cost, Cost sheet, Materials, purchase of materials, stores and stock control.

Unit 4

Unit 5
Some exercises and case studies.

TEXTBOOKS:
2. S.P. Jain, K.L. Narang – Cost Accounting, Kalyani Publishers
3. Tally Manual

REFERENCES:
2. R.S.N. Pillai and Bagavathi: Management Accounting, S. Chand
SYLLABI
5yr Integrated Master of Comp. Applications 2015 admissions onwards

15CSA101  BASICS OF PROGRAMMING  2002

Objectives: Describe the main principles of procedure oriented programming languages, programming language history and the central formalisms used in the description of programming languages.

Unit 1
Introduction to programming - problem solving techniques, algorithms, flowcharts. Introduction to C language – History of C, features, C as a structured language, C as a middle level language, applications, advantages.

Unit 2
Structure of ‘C’ program, preprocessor directives, Execution phases, C conventions, character set, Programming elements (tokens) Classes of data types, Declaration of variables, escape sequences (backslash character constants), Operators, operator precedence and associativity.

Unit 3
Expressions – arithmetic, relational and logical, Evaluation of expressions, type conversions (type casting), mathematical library functions. Input and Output operations – Conversion specifiers, Control statements.

Unit 4
Arrays – single dimensional arrays (linear arrays), Two-dimensional arrays – declaration, initialization, accessing elements in 2D array and memory representation, Multidimensional arrays.

Unit 5
Strings – defining strings, initializing, accessing, character handling functions, arithmetic operations on characters, character by character input and output, string handling functions, array of strings and its features.

TEXTBOOKS:

REFERENCES:

15CSA102  FUNDAMENTALS OF DBMS  1001

Objectives: The course helps in understanding the basic concepts and needs for and uses of database management systems. Also gives a good formal foundation on the relational model of data and provides a base in SQL.

TEXTBOOKS:

REFERENCE:
C.J. Date: An Introduction to Database Systems - Eighth Edition - Pearson Education Asia

15CSA103  FUNDAMENTALS OF WEB TECHNOLOGY  2002

Objectives: This course provides the student with experience in the design and implementation of Internet Web sites for business applications. Defines and discuss major concepts, tool, techniques, and methods of web application development.

Unit 1
History of SGML - Introduction to Internet – Resources of Internet - Hardware and Software requirements for Internet - Internet Service Providers (ISP).

Unit 2

Unit 3
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 4
HTML5 – HTML5 elements - Building a form and form elements - Introduction to CSS - Style Sheets Formatting - Advanced Layouts and Positioning with style Sheets.

Unit 5

TEXTBOOKS:

15CSA111 ADVANCED C 3 0 0 3
(Prerequisite: 15CSA101 Basics of Programming)

Objectives: This course is intended to introduce the advanced concepts in C and shows how these concepts are useful in programming.

Unit 1
Functions – defining function, accessing a function, need for functions, function declaration and prototypes, function call, return statement, actual and formal arguments, passing arguments to functions, passing arrays to functions, other types of functions – functions with no arguments and no return values, function with arguments but no return values, function with arguments and return values, function with no arguments and return values, recursive functions, Nesting of functions, Passing structures to functions, call by value and call by reference, storage class specifiers – automatic, register, static and external.

Unit 2
Structures – defining a structure, declaring structure variables, accessing structure elements, initializing structures, array of structures, array within structures, structures within structures, self-referential structures, uses of structures, Unions – defining unions, union of structures, uses of unions, Enumerated data types, uses of enumerated data type, typedef.

Unit 3
C - Preprocessor Macros - Macro substitution, simple, macros with arguments, nesting of macros, File inclusion, Command line arguments.

Unit 4
Pointers - Fundamentals of pointer variables, usage, pointer declaration and accessing the address of the variable. Initialization of pointer variables, accessing a variable through its pointer, Operations - Pointer increments, decrements, comparison and scale factor. Pointers as function arguments. Passing one dimensional array, two dimensional array to functions and array pointers. Pointers to structures and troubles with pointers.

Unit 5
Input Output in C - File modes, opening and closing of files, reading and writing of files. Introduction to binary files, difference between text and binary files. Insertion, modifying, deletion and searching records in a file.

TEXTBOOKS:

REFERENCES:
"Test your C skills", Yashavant Kanetkar,
"Exploring C", Yashavant Kanetkar,

15CSA112 ADVANCED DBMS 2 0 0 2
(Prerequisite: 15CSA102 Fundamentals of DBMS)

Objectives: Understanding of the components of a database system, experience with the programming version of SQL i, PL/SQL and an introduction of some advanced topics in database management, e.g., object-relational databases and design, distributed databases, database administration and data warehousing.

Unit 1

Unit 2

Unit 3

Unit 4
Query Processing and Optimization: Evaluation of Relational algebra expressions -

**Unit 5**


**TEXTBOOKS:**

**REFERENCES:**
1. C.J. Date: An Introduction to Database Systems - Eighth Edition - Pearson Education Asia

**15CSA113 ANALYSIS OF ALGORITHMS 2002**

**Objectives:** To introduce techniques for analyzing the efficiency of computer algorithms, to provide knowledge about various searching and sorting techniques.

**Unit 1**


**Unit 2**

Growth of functions – Big-Oh Notation – Basic Recurrences – Examples of Algorithm Analysis.

**Unit 3**


**Unit 4**


**Unit 5**

15CSA115  OBJECT ORIENTED PROGRAMMING USING C++  2 0 0 2

Objectives: This course is intended to introduce the advanced concepts of object oriented programming and shows how these concepts are useful in problem solving.

Unit 1
Introduction to Object Oriented Programming, C++ Environment: Manipulators - Classes and Objects, Making sense of core object concepts (Encapsulation, Abstraction, Polymorphism, Classes, Messages Association, Interfaces) Implementation of class in C++, C++ Objects as physical object, Object as function arguments, returning object from function, Structures and classes. Classes objects and memory static class data. Const and classes.

Unit 2
Data Members, Access Specifiers, Array within a Class, Array of Objects - Scope Resolution Operators, Inline Functions, Constructors, Default Constructors, Destructors, Static Members, This Pointer.

Unit 3

Unit 4
Run time Polymorphism: Virtual Functions, Pure Virtual Functions, Abstract Class, Class Templates, Function Templates, Exception Handling.

Unit 5
Data files - C++ stream classes, unformatted and formatted I/O operations, Opening and closing of files, File modes, File pointers and manipulation, Sequential input and output operations , Upgrading a file, Error handling during file operations.

TEXT/ REFERENCES:

15CSA181  BASICS OF PROGRAMMING LAB.  0 0 3 1

1. Program to accept two numbers and find their sum, difference, product, quotient and remainder.
2. Program to accept three numbers and find their average.
3. Program to swap two numbers with and without using a temporary variable.
43. Program to find trace and norm of a square matrix
44. Program to print the sum of diagonal elements of a matrix
45. Program to determine whether the given matrix is an upper triangular matrix
46. Program to find the largest and smallest in each row of a given matrix
47. Program to find the largest and smallest in each column of a given matrix
48. Program to print ASCII code for a given character using ASCII value
49. Program to check if a given character is a letter or a digit or a special character without using ASCII value
50. Program to check if a given character is a letter or a digit or a special character using ASCII value
51. Program to accept a string and count the number of vowels and consonants in it
52. Program to input a line of text and remove all blanks and punctuations
53. Program to find the name of the Parts in the colours (Red, Blue, Green) (using ‘IN’ and ‘OR’).
54. Program to get the name of the Supplier who lives in the same city of Supplier ‘James’.
55. Get the date on which product ‘Nut’ was last supplied.
56. Get the name of the Supplier supplying all the Parts.
57. Get the names of the supplying the products supplied by supplier ‘Harry’.
58. Get the Pname and total qty of Parts supplied by each Supplier.
59. Get the details of Suppliers currently not supplying any product.
60. Get the third highest weight in the Parts table.
61. Get the name of the Part having the second highest weight.
62. Get the name of all Suppliers.
63. Count the number of Suppliers.
64. Get the maximum status in the Supplier Table.
65. Get the name of the Supplier supplying all the Parts.
66. Get the details of Suppliers whose status is between 10 and 20.
67. Get the name of the Supplier supplying all the Parts.
68. Get the details of Suppliers whose status is between 10 and 20.
69. Get the details of Suppliers currently not supplying any product.
70. Get the name of the Supplier supplying all the Parts.
71. Get the name of the Parts in the colours (Red, Blue, Green) (using ‘IN’ and ‘OR’).
72. Get the name of the Supplier who lives in the same city of Supplier ‘James’.
73. Get the details of Suppliers currently not supplying any product.
74. Get the third highest weight in the Parts table.
75. Get the name of the Part having the second highest weight.
76. Get the name of all Suppliers.
77. Count the number of Suppliers.
78. Get the maximum status in the Supplier Table.
79. Get the name of the Supplier supplying all the Parts.
80. Get the details of Suppliers whose status is between 10 and 20.

15CSA182  FUNDAMENTALS OF DBMS LAB.  0 0 3 1

1. Create the following tables and perform the query below.

<table>
<thead>
<tr>
<th>SUPPLIER</th>
<th>FIELD NAME</th>
<th>TYPE</th>
<th>CONSTRAINT</th>
<th>PRIMARY KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNO</td>
<td>VARCHAR2(5)</td>
<td></td>
<td>PRIMARY KEY</td>
<td></td>
</tr>
<tr>
<td>SNAME</td>
<td>VARCHAR2(30)</td>
<td></td>
<td>NOT NULL</td>
<td></td>
</tr>
<tr>
<td>CITY</td>
<td>VARCHAR2(30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STATUS</td>
<td>NUMBER(5)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARTS</th>
<th>FIELD NAME</th>
<th>TYPE</th>
<th>CONSTRAINT</th>
<th>PRIMARY KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNO</td>
<td>VARCHAR2(5)</td>
<td></td>
<td>PRIMARY KEY</td>
<td></td>
</tr>
<tr>
<td>PNAME</td>
<td>VARCHAR2(30)</td>
<td></td>
<td>NOT NULL</td>
<td></td>
</tr>
<tr>
<td>COLOR</td>
<td>VARCHAR2(30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEIGHT</td>
<td>NUMBER(5)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPLIER PARTS</th>
<th>FIELD NAME</th>
<th>TYPE</th>
<th>CONSTRAINT</th>
<th>PRIMARY KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNO</td>
<td>VARCHAR2(5)</td>
<td></td>
<td>FOREIGN KEY</td>
<td></td>
</tr>
<tr>
<td>PNO</td>
<td>VARCHAR2(30)</td>
<td></td>
<td>FOREIGN KEY</td>
<td></td>
</tr>
<tr>
<td>SDATE</td>
<td>DATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QTY</td>
<td>NUMBER(10,2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Insert 10 records inside three tables.
b. Get the details of all Parts.
c. Get the details of all Suppliers.
d. Get the details of Suppliers in the city ‘Paris’.
e. Count the number of Suppliers
f. Get the maximum status in the Supplier Table
g. Get the name of the suppliers in the city of London
h. Get the details of Supplier whose status is between 10 and 20

15CSA183  FUNDAMENTALS OF WEB TECHNOLOGY LAB.  0 0 3 1

1. Create a personal Blog. Add personal information.
2. Create a simple web page, which reveals the personal information of yours.
3. Design a web page with an interface for creating an e-mail id.
4. Develop a web site for a University, which offers different UG and PG Courses.
   (Hint: Using Frames, Framesets, Images, Menus and Hyperlinks)
5. Create a web page with advanced layouts and positioning with CSS and HTML.
6. Design a website with different methods of embedding CSS in a web page.
7. Create a static web page which displays your personal details. (Hint: CSS3 and HTML5)
8. Create a web page through which the user can enter his / her details to become an authenticated user of that page.
9. Create a website for a Computer Hardware shop. (Hint: CSS3 and HTML5)
10. Create a website for Amrita School of Arts and Sciences. (Hint: CSS3 and HTML5)

15CSA184  INFORMATION TECHNOLOGY BASICS LAB.  0 1 3 2

PC assembly using Simulation tools
Office Automation Tools: Word processors, spreadsheet, presentations
Internet applications (eg: Google Docs, Google Forms etc.)
Program to compare two given strings with and without using string function
5yr Integrated Master of Comp. Applications
NUMBER(10,2)
Program that counts the number of lines, words, and characters in its input
FOREIGN KEY
S 16
Program to find the length of a given string with and without using string function
Using reverse for Loop Finds the Reverse of a string.
0 0 3 1
Program to reverse a given string with and without using string function
7.
Program to search for a substring in a given string with and without using string function
Program that counts the number of lines, words, and characters in its input
Program to convert the characters in a string from lowercase to uppercase and vice versa
Program to find whether a given string is palindrome or not
Program to find whether a given number is prime or not using function
Program to find \( x^n \) where \( x \) is real and \( n \) is integer using Function
Program to find factorial of a given number using recursion
Program to find the sum of \( n \) natural numbers using recursion
Program to find \( n \)th Fibonacci number using recursion
Program to generate Fibonacci series using recursion
Program to compute \( x^n \) where \( x \) is real and \( n \) is integer using recursion
Program to calculate GCD of two integers using recursion
Program to print a line of text in reverse order using recursion
Program to find the employees who is getting salary between Rs 10000 to 20000 using structures
Program to find the student record whose age is between 18 to 25
Program to find the employee record who is working in a research department
Program to find the employee records having the same name
Program for matching the names of countries with their corresponding capitals using structures
Program that creates a structure for a product which includes product number, product name and cost.
Program to search for a given employee record based on id
Program to use union to declare a single variable that can store an integer, a character and a character string.
Program to define a union that can store an integer, a floating point quantity and a double precision quantity. Then define a structure that contains a union of the above type, a character and an integer. Then declare 2 structure variables
Write a c program to test whether a character entered is a small case letter or not (using Macros).
Write a c program to find the largest of 2 numbers (using Macros).
Write a macro definitions with arguments for calculations of area and perimeter of a triangle, a square and a circle. Store these macro definitions in a file called "areaperi.h". Include this in your program and call macro definitions for calculating area and perimeter for different squares, triangles and circles.
Write a program to illustrate command line arguments.
Write a program that uses pointers to set each element of an array to zero.
Write a function that takes a single string as its argument and returns a pointer to the first nonwhite character in the string.
Write a program to display the contents of array using pointer.
Write a c program to perform arithmetic operations on pointers.
Write a c program to find the Fibonacci series using pointers.
Write a program that dynamically allocates a chunk of memory large enough to store 6 integers. Then prompt the user to enter 6 integers and store them in your newly-allocated memory. Finally, print the integer values in reverse order. Did you remember to free the memory you allocated? If not, please add this to your program.
Find sum of all the employees salaries using pointers in structures.
Write a program to implement a linear list and perform the operation such as insert(), search() and delete).
Write a program to display the contents of a file on the screen.
Write a macro definitions with arguments for calculations of area and perimeter of a triangle, a square and a circle. Store these macro definitions in a file called "areaperi.h". Include this in your program and call macro definitions for calculating area and perimeter for different squares, triangles and circles.
Write a program to illustrate command line arguments.
Write a program that uses pointers to set each element of an array to zero.
Write a function that takes a single string as its argument and returns a pointer to the first nonwhite character in the string.
Write a program to display the contents of array using pointer.
Write a c program to perform arithmetic operations on pointers.
Write a c program to find the Fibonacci series using pointers.
Write a program that dynamically allocates a chunk of memory large enough to store 6 integers. Then prompt the user to enter 6 integers and store them in your newly-allocated memory. Finally, print the integer values in reverse order. Did you remember to free the memory you allocated? If not, please add this to your program.
Find sum of all the employees salaries using pointers in structures.
Write a program to implement a linear list and perform the operation such as insert(), search() and delete).
Write a program to display the contents of a file on the screen.
Write a macro definitions with arguments for calculations of area and perimeter of a triangle, a square and a circle. Store these macro definitions in a file called "areaperi.h". Include this in your program and call macro definitions for calculating area and perimeter for different squares, triangles and circles.
Write a program to illustrate command line arguments.
Write a program that uses pointers to set each element of an array to zero.
Write a function that takes a single string as its argument and returns a pointer to the first nonwhite character in the string.
Write a program to display the contents of array using pointer.
Write a c program to perform arithmetic operations on pointers.
Write a c program to find the Fibonacci series using pointers.
Write a program that dynamically allocates a chunk of memory large enough to store 6 integers. Then prompt the user to enter 6 integers and store them in your newly-allocated memory. Finally, print the integer values in reverse order. Did you remember to free the memory you allocated? If not, please add this to your program.
Find sum of all the employees salaries using pointers in structures.
Write a program to implement a linear list and perform the operation such as insert(), search() and delete).
Write a program to display the contents of a file on the screen.
Write a macro definitions with arguments for calculations of area and perimeter of a triangle, a square and a circle. Store these macro definitions in a file called "areaperi.h". Include this in your program and call macro definitions for calculating area and perimeter for different squares, triangles and circles.
Write a program to illustrate command line arguments.
Write a program that uses pointers to set each element of an array to zero.
Write a function that takes a single string as its argument and returns a pointer to the first nonwhite character in the string.
Write a program to display the contents of array using pointer.
Write a c program to perform arithmetic operations on pointers.
Write a c program to find the Fibonacci series using pointers.
Write a program that dynamically allocates a chunk of memory large enough to store 6 integers. Then prompt the user to enter 6 integers and store them in your newly-allocated memory. Finally, print the integer values in reverse order. Did you remember to free the memory you allocated? If not, please add this to your program.
Find sum of all the employees salaries using pointers in structures.
Write a program to implement a linear list and perform the operation such as insert(), search() and delete).
Write a program to display the contents of a file on the screen.
always maintained. Tno must be automatically generated. Tdate is Sysdate. 
(Use exceptions in your program)
4. Create a program to print the details of first five highest paid employees from 
the Emp Table.
5. Count the number of employees in each department in the Employee Table. If 
the number of employees is more than two put those employees in a separate 
table maintained for that Dept. (Use parameterized cursor).
6. Create a program to split Emp Table into two. After splitting merge the Splitted 
tables inside a third table.
7. Create a function to find the factorial of a number (using recursive function)
8. Create a function to find the Fibonacci Series (using recursive function)
9. Create a function to check whether a table exists in your User Area.
10. Consider the Inventory Tables Item Master and Sales. Create a procedure to 
delete the items having no sales.
11. Create a Library Information System using PL/SQL.
12. Create a package having two procedures, one to check whether the Inputted 
    number is Positive or Negative, other to check whether the inputted date is greater 
    than or less than Sysdate.
13. Create a trigger to insert into RET_EMP when a record is deleted from EMP.
14. Create a trigger to prevent insertions on Product Table on Sundays.
15. Create a trigger to update the stock of an item when a sale is made for the item.
16. Using dynamic SQL create a Table at Run Time.
17. Create a procedure to drop a Table passed as parameter.
18. Create a procedure for the automatic generation of primary key.
19. Create user defined type person having attributes Pno, Name, Dob and Member 
    Function Derive Age to calculate age. Define a column Person_Det of Emp_Table 
    and Student_Table of type person.
20. Create a PL/SQL to insert into object tables.
21. Create V array 'Hobby' of array size 5 and define Column Hobbies in Emp_Table 
    of type hobby. Generate an OID for above created object types.

15CSA191 OBJECT ORIENTED PROGRAMMING USING C++ LAB 003 1

1. Write a C++ program to implement flight class with data member as flight no., 
    source, destination and fare. Write a copy constructor and a member function to 
    display the flight information.
2. Write a C++ program to implement a string object. Include member functions to 
    compare two strings and to concatenate two strings.
3. Write a C++ program to implement a class to represent complex numbers. 
    Include member functions to add and multiply to complex numbers. Overload 
    assignment operator =
4. Write a C++ program to implement time class that has separate data members 
    for hours, minutes and seconds. Overload + Operator to add two times (object) 
    and ++ operator to increment the time by one second.
SYLLABI  5yr Integrated Master of Comp. Applications  2015 admissions onwards

Unit 4

Unit 5
Principles of Network Applications - Web and HTTP - Electronic mail – DNS - DNS Name space – Resource Records – Name Servers – FTP.

TEXTBOOK:
Computer Networks (Fifth Edition) – Andrew S. Tanenbaum (Prentice Hall of India)

REFERENCES:

15CSA202  DATA STRUCTURES  3 0 0 3

Objectives: This course is intended to introduce abstract concepts and shows how those concepts are useful in problem solving, and then shows how the abstractions can be made concrete by using a programming language. Equal emphasis is placed on both the abstract and the concrete versions of a concept.

Unit 1
Information and meaning – Binary and Decimal Integers - Real numbers – Character Strings – Abstract Data Types – ADT for varying length character strings. Elementary Data Structures – Arrays – The arrays as an ADT – Using One Dimensional Arrays - implementing one dimensional arrays – Arrays as Parameters – Two Dimensional Arrays - Multidimensional Arrays.

Unit 2
The Stack – Definition – Primitive operations – Stack as an abstract Data Type – Stack in C++ using Templates. Example: Infix, Postfix and Prefix Basic definitions and examples – Evaluating a Postfix Expression – Converting an Expression from infix to postfix.

Recursion – Recursive definition and Processes – Factorial Function – multiplication of natural numbers – Properties of Recursive Definitions or Algorithms. Recursive

SYLLABI  5yr Integrated Master of Comp. Applications  2015 admissions onwards

Unit 3
Queues and lists – The queue and its Sequential Representation – The Queue as an Abstract Data Type – Insert operation – Priority Queue.

Unit 4
Linked lists – Inserting and Removing nodes from a list – Linked list implementation of Stack – getnode and freenode operations – Linked implementation of Queues – Linked List as a Data Structure – Nodes.


Unit 5

TEXTBOOK:

REFERENCE:

15CSA203  JAVA PROGRAMMING  3 0 0 3

Objectives: The main objective of this course is to understand the basic concepts and techniques which form the object oriented programming paradigm using Java Language.

Unit 1
Introduction and Features of Java - Byte Code, Multithreading, Program Translation, JVM.

Unit 2
Program Structure, Data types, Java Statements, Type casting in Java programs - Types of Operators.

Unit 3
Decision Making statements, Looping statements-Arrays, Strings, Vectors, Wrapper classes - Class, methods, Inheritance, Visibility control, Final Classes, methods and Variables.
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 4
Interfaces - Interfaces in Java Library - Packages - System Packages, User defined packages – Multithreading - Threads, Runnable Interface, Thread Priorities - Exception Handling - try, catch, throw, throws, finally.

Unit 5

TEXTBOOK:

REFERENCE:

15CSA204 OPERATING SYSTEM 3003

Objectives: Fundamental concepts and algorithms will be covered along with the practical aspects that pertain to the most popular operating systems such as Unix/Linux and Windows, and some instructional operating systems will be studied as well.

Unit 1
Introduction to Operating Systems: Mainframe systems - Desktop systems - Multiprocessor systems - Distributed systems - Clustered systems - Real-time systems - Handheld systems.


Unit 2

Unit 3
CPU Scheduling: Basic concepts - Scheduling criteria - Scheduling Algorithms - First Come First served Scheduling, Shortest job First Scheduling, Round Robin Scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling.

Unit 4

SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 5

TEXTBOOK:

REFERENCES:

15CSA211 ADVANCED JAVA PROGRAMMING 3003 (Prerequisite: 15CSA203 Java Programming)

Objectives: The main Objective of the course is to enable students to understand the concepts underlying technologies in JAVA Enterprise edition with Swings and multithreading, configuring Apache tomcat server, Java beans and Enterprise Java Beans.

Unit 1
Networking: Classes to be covered Socket, ServerSocket, IPAddress, URL connections – Swing controls – JDBC - Writing JDBC applications using select, insert, delete, update.

Unit 2

Unit 3

Unit 4
Package Handling HTTP Request and Response (GET/ POST Request), Using Cookies, Session Tracking. Exception Handling.

Unit 5
Introduction to Beans and Bean Development Kit (BDK). Advantages of Java Beans
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

(Bean concepts - Events in bean box - Bean customization - Persistence – Application) Using the Java Beans API Session beans - Entity beans - Programming and deploying enterprise Java Beans.

TEXTBOOKS:

15CSA212 INTRODUCTION TO NETWORK SECURITY 2002

Objectives: This course covers the fundamentals of network security and covers topics such as active and passive attacks on networks, encryption, symmetric and asymmetric key systems, authentication using certification authorities, and access control using passwords and firewalls.


Unit 3 Need of cryptography – introduction to symmetric and public key crypto systems.

Unit 4 Non malicious program errors - Viruses and malicious code - Targeted malicious code - Controls against program threats and controls.


TEXTBOOKS:

15CSA214 .NET FRAMEWORK 2002

Objectives: This course helps to effectively use visual studio .NET and provides an understanding of the goals and objectives of the .NET Framework.

Unit 1 Introduction to .NET framework: Managed Code and the CLR - Intermediate Language, Metadata and JIT Compilation - Automatic Memory Management.

Unit 2 Language Concepts and the CLR: Visual Studio .NET - Using the .NET Framework.

Unit 3 Base Class Library, Common Type System (CTS), Common Language Specification, Intermediate Language, Namespaces, Installation of Visual Studio,

Unit 4 Various features of IDE, Different type of applications. Metadata – Interoperability.
SYLLABI  

**5yr Integrated Master of Comp. Applications**  
2015 admissions onwards

**Unit 5**  
Assemblies - The Framework Class Library: .NET objects.

**TEXTBOOK:**  
Robert Powel, Richard Weeks, *C# and the .NET Framework*, Techmedia

**15CSA215 SOFTWARE ENGINEERING**  

**Objectives:** Software Engineering presents a broad perspective on software systems engineering, concentrating on widely used techniques for developing large-scale software systems. This course covers a wide spectrum of software processes from initial requirements elicitation through design and development to system evolution.

**Unit 1**  

**Unit 2**  
Software requirements specification - System modeling - Software prototyping - Developing simple formal specification - error specification - model based specification - object oriented design.

**Unit 3**  
Design process considerations - Transform analysis - design heuristics – Design optimization - Data structure versus data flow techniques - Jackson system development - Warnier – o-r diagrams - Data structures system development.

**Unit 4**  
Real Time system - data flow oriented design method - programming function reliability - software reuse – CASE - software development environments. Software quality assurance - quality metrics - software testing - path testing - control structure testing - black box testing - integration - validation and system testing.

**Unit 5**  
Software maintenance - reverse engineering and reengineering – Information System Auditing.

**TEXTBOOK:**  

**REFERENCE:**  

SYLLABI  

**15CSA216 WEB PROGRAMMING**  

(Please note: 15CSA216 is a prerequisite for 15CSA215)

**Objectives:** This course allows the students to create web sites with client side scripting and dynamic content that interacts with databases. Also discuss major tools, techniques, and methods of dynamic web application development.

**Unit 1**  
Scripting Basics - Introduction to JavaScript - Creating Simple JavaScript - using and Storing Values - Strings and Arrays.

**Unit 2**  

**Unit 3**  
PHP basics, string processing & regular expressions, Components of strings, Form processing and Business Logic, Creating sessions, Using Cookies, dynamic contents.

**Unit 4**  
Introduction to MySql, Creating connection with MySql, Connecting to database, Insert, Update, delete records from database using PHP interface.

**Unit 5**  

**TEXTBOOKS:**  

**15CSA281 DATA STRUCTURES LAB.**  

**Objectives:**  
1. Write and test a Boolean function that determines whether a given positive integer is prime.
2. Write function prototypes for the following:
   (i) a function which receives an int and a float and returns a double.
   (ii) a function that receives an int pointer and float reference and returns an int pointer
   (iii) a function which doesn’t receive anything and doesn’t return anything.
3. Write and test a function that reverse the digits of a positive integer (for eg: reverse (5026) would return 6205).
4. Write and test a program that develops a matrix class which can handle integer matrices of different dimensions. Within matrix class overload operators to carry out the
   (i) addition
   (ii) multiplication and
   (iii) comparison of two matrices.
5. Write a program that prints Pascal’s triangle of binomial coefficient like this
   
   1
   1 1
   1 2 1
   1 3 3 1
   1 4 6 4 1
6. Write and test a function that transposes a square matrix.
7. Write and test a recursive function that prints all the permutations of the first n characters of a string.
8. Write and test a recursive function that returns the power xn
9. Write a program to implement a stack of strings (illustrate the operations push(), pop(), size(), empty(), and top()).
10. Write a program to show the linked implementation of the Stack class.
11. Write a program to implement Towers of Hanoi using Stack.
12. Write a program to implement a linear list and perform the operation such as insert(), search() and delete().
13. Write a program to implement a queue by adding the functions such as
   (i) Determine the size
   (ii) input queue
   (iii) output a queue
   (iv) split a queue into two queues
14. Write a program to search a circular linked list with a header node.
15. Write a program to search a circular linked list with a header node.
16. Write a program to create a binary tree and find the height of a binary tree.
17. Write a program to perform the binary tree traversals.
18. Write a program to perform a deletion from a Binary Tree (using a delete () function).
19. Write a program to implement Bubble Sort.
20. Write a program to implement Quick Sort.
21. Write a program to implement Heap Sort.
22. Write a program to implement Radix Sort.
23. Write a program to implement Binary Search.
24. Write a program to implement Binary Search Tree.
1. Create a simple web page, which reveals the personal information of yours.
2. Create an MSIL program to print “Hello World”.
3. Create a web site for a Computer Hardware shop.
4. Design a web page with an interface for creating an e-mail ID.
5. Develop a web site for a University, which offers different UG and PG Courses.

**WEB PROGRAMMING LAB.**

1. Write a program using delegates to sort two numbers in ascending and descending order.
2. Write a program with a base class Student and sub class marks to accept and display the Name and Marks of 2 students. The name should be a Base class variable and marks should be sub class variables. Create Object for sub class only.
3. Accept the string “bca” (all in small letter) and Change the first and second letters to capital and accept the string ‘semester’. combine and display the string with the user given semester name in between. Eg (Bca second semester, here second is user given).
4. Overload the operators ‘+’ and ‘-’. Use these operators on objects in Main and display the results. Class should have two members real and complex of integer type.
5. Write a program using static constructor to show the current date through the main function.
6. Create an MSIL program to print “Hello World”.
7. Create a Windows application to show a message box “Hello World”.

**.NET FRAMEWORK LAB.**

1. Create a frame which displays your personal details with respect to a button click.
2. Create a GUI program in java with the following components.
   a. A frame with flow layout.
   b. Add the following components on to the frame.
      i. Two Text Field
      ii. A button with the label display
   c. Allow the user to enter data into the text field
   d. When the button is clicked paint the frame by displaying the data entered in the text field
   e. Allow the user to properly close the frame
15CSA287  ADVANCED JAVA PROGRAMMING LAB.  0 0 3 1

1. Program to demonstrate Swing components.
2. Program to implement Address Book using Swing components.
3. Program to demonstrate loading of file in a Swing Component.
4. Multithreading program, one of the threads print a ....z and other thread print 1....26.
5. Example: 1a2b3c.... 26z.
6. Multithreading program to schedule two jobs.
8. Server Socket which receives data from a java client program.
9. Program to fetch a particular Website tags when an URL is specified.
10. Implement stack, queue, hashmap, hashtable, enumeration, ArrayList.
11. Create a table from a java program.
12. Update a table from a java program.
13. Load a table data in Swing components.
14. Delete a record from a table, drop table from a java file.
15. Program which shows use of Statement, Prepared Statement and Callable Statement.
16. Configure Apache Tomcat and write a hello world jsp page.
17. Configure Apache Tomcat server to deploy Servlets.
18. Exceptional handling in a JSP page.
19. Create a login page and authenticate a user in a JSP page using database.
20. Write a program to implement a simple servlet which writes a Welcome HTML page in the web browser.
21. A servlet should receive a parameter from JSP page and process it.
22. Servlet program to implement parameter handling.
23. Servlet program to handle GET and POST request.
24. A website hit counter data which has to be saved in a cookie.
25. Implement a Java Beans to set and get values.
26. Program to illustrate the procedure of handling session and print a Hello world using Java Bean.
27. Enterprise Session Beans, deploy, and run a simple Java EE application which does add, subtract, multiply and division using stateless session bean.
28. An application named account using stateful session bean. The purpose of account is to perform transaction operations (deposit and withdraw) for the customer.
29. The account application consists of an enterprise bean, which performs the transactions, and two types of clients: an application client and a web client.

15CSA301  FUNDAMENTALS OF CRYPTOGRAPHY  3 0 0 3

Objectives: The main objective of this course is to introduce the working of various cryptographic methods and how to apply this knowledge to real-world applications.
SYLLABI 5yr Integrated Master of Comp. Applications  2015 admissions onwards

Unit 3
Advanced C# Type Construction: Indexers, operator overload, conversions - Windows Forms and WPF. Basic windows programming; forms, component class, control class, control events, menus, status bars, tool bars, interacting with the registry.

Unit 4
Drawing in Windows (GDI+): Paint sessions, the Graphics class, coordinate systems, color, fonts, hit testing.

Unit 5
Input, Output, and Serialization: System.IO, Directory and File Types, StreamReaders and StreamWriters, working with binary data, configuring objects for serialization.

TEXTBOOK:
Latest version or two of Andrew Troelsen's C# text from Apress (Pro C# 5.0 and the .NET Framework 4.5)

15CSA303 MOBILE TECHNOLOGIES AND APPLICATION DEVELOPMENT

Objectives: The purpose of this course is to provide an introduction to modern digital mobile and wireless communication systems. It also provides a comprehensive introduction to the design and implementation of Android applications for handheld systems, such as smart phones and tablets.

Unit 1
GSM – Mobile services, system architecture, Radio interface, protocols, Localization and calling, Handover, security - 27--31 GPRS, HSCDC.

Unit 2
Wireless LAN: IEEE 802.11, system architecture - IEEE-802.11

Unit 3
Protocol architecture, physical layers, medium access control layers, MAC management 802.11b, 802.11 a, Hiper LAN.

Unit 4
Bluetooth, Adhoc network, sensor network - Mobile IP, DHCP.

Unit 5

LAB:
Setting up your Android Development Environment
Working with screen configurations and multiple screen sizes
Working with the all-important Activity Class and its lifecycle - being able implement intents and permissions
Running multiple activities with the Fragment Class
Creating user interfaces to make your apps run smoothly for your users
Notifying users about important events

TEXTBOOKS:
1. Mobile Communications by Jochen Schiller, Pearson Education 2nd Edition
2. Wireless communications & Networks by William stallings.
5. Android Programming: Pushing the Limits, Wiley By Erik Hellman
6. Android Application Development Black Book, Dreamtech Press, Pradeep Kothari, KLSI

15CSA304 OBJECT-ORIENTED ANALYSIS AND DESIGN 2002

Objectives: This course teaches proven real world techniques to meet the biggest challenge in the software development community – building quality systems which fulfil your requirements, and delivering them on time. The focus of the course is to give you the practical skills that are most critical in building well designed software systems.

Unit 1

Unit 2
Attributes: Object state and properties - Object Behavior and Methods - Object Respond to Messages - Encapsulation and Information Hiding - Class Hierarchy - Classes and Object - Object Oriented Systems Development Lifecycle.

Unit 3

Unit 4
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 5

TEXTBOOK:

REFERENCES:
1. James Rumbaugh Michael Blaha – Object Oriented Modeling and Design PHI
2. E Balaguruswamy – Object Oriented Technology - Tata Mc Graw Hill

15CSA311 COMPUTER GRAPHICS 3 0 0 3

Objectives: The primary objective of this course is to give the basic principles of 2D and 3D computer graphics, to study the elementary mathematical techniques that allow us to position objects in three dimensional spaces and techniques necessary to produce basic 2D/3D dimensional illustrations.

Unit 1
Applications of Graphics: CAD, Presentation Graphics, Computer Art, Entertainment, Education and Training, Visualization, Image Processing,

Unit 2

Unit 3
Input Devices: Keyboards, Mouse, Data Glove, Digitizers, Touch Panels; Hard Copy Devices: Printers, Plotters, Output Primitives: Bresenham's Line Algorithm, Midpoint Circle Algorithm; Filled Area Primitives: Boundary-Fill Algorithm, Flood-Fill Algorithm; Character Generation; Homogeneous Coordinates.

Unit 4
Two Dimensional Geometric Transformations; Translation, Rotation, Scaling, Reflection, Shear; Two Dimensional Viewing: Cohen Sutherland Line Clipping Three Dimensional Geometric Transformations; Translation, Rotation, Scaling, Reflection, Shear; Three Dimensional Viewing: Projections, Parallel Projections, Perspective Projections, View Volumes and General Projection Transformations.

Unit 5

TEXTBOOKS:

15CSA331 ARTIFICIAL INTELLIGENCE 3 0 0 3

Unit 1
What is Artificial Intelligence? -- The AI Problems – The Underlying Assumption – What is an AI technique – Criteria for Success.


Unit 2

Unit 3


Statistical Reasoning – Probability and Baye’s Theorem – Bayesian Networks – Fuzzy Logic.

Unit 4
Game Playing - The Minimax Search Procedure – Adding Alpha-Beta Cutoffs. Understanding – What is Understanding? What makes Understanding hard?
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 5

TEXTBOOKS:

REFERENCES:
2. Introduction to Artificial Intelligence – Eugene Charnaik, Drew McDermott (Pearson Education Asia)

15CSA332 ARCHITECTURE AND DEPLOYMENT OF SECURE AND SCALABLE WAN

Unit 1
Introduction to Scaling Networks, Implementing a Network Design, LAN Redundancy, Spanning Tree Concepts and protocols.

Unit 2

Unit 3

Unit 4
PPP Operation and Configuration, HDLC protocol, Troubleshoot WAN Connectivity, Frame Relay concepts and Configurations, NAT Operation & Configuration, Troubleshooting NAT.

Unit 5
Tele working, Broadband Solutions, Configuring xDSL Connectivity, Securing Site-to-Site Connectivity, VPNs, Site-to-Site GRE Tunnels, IPsec, Monitoring the Network – Syslog, SNMP, Netflow, Network Troubleshooting with a Systematic Approach.

TEXTBOOKS:
1. Youlu Zheng and Shakil Akhtar,”Networks for Computer Scientists and Engineers”.

SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

REFERENCES:

15CSA335 INTRODUCTION TO DISTRIBUTED COMPUTING 300 3

Objectives: Client Server Computing Model defines the way successful organizations will use technology during the next decade. As a result knowledge of client server architecture has become an essential part of computer science. The main objective is to provide the basic concepts of client server computing and the new technologies involved in it.

Unit 1

Unit 2

Unit 3

Unit 4
Unit 5

TEXTBOOK:

REFERENCES:
1. Alex Berson: Client Server Architecture

15CSA336 EMBEDDED SYSTEMS 3003

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5
Debugging Techniques - Testing on Host Machine – Instruction Set simulators –
**SYLLABI**

**5yr Integrated Master of Comp. Applications**

**2015 admissions onwards**

**Unit 5**

**Client Server and ERP Architecture**


http://ebuild.imtindia.com/erp_software_architecture.html

Open Technology

Background of Open Technology – Introduction – Proprietary v/s Open source – Need for Open Source Solutions – Open Source ERP.

http://elearning.nic.in/mdp/2-open-technology/opentechnology-mdp.pdf

Commercial ERP

Commercial ERP – Open Source ERP v/s Commercial ERP.


**TEXTBOOK:**


**15CSA338 KNOWLEDGE MANAGEMENT 3 0 0 3**

**Unit 1**


**Unit 2**


**Unit 3**


**Unit 4**

Knowledge Management Principles – Knowledge Management at work in Organization.

**Unit 5**

Technology Foundations – The Internet and Internet Services – Web Components and Communications.

**TEXTBOOKS:**

Web Warehousing and Knowledge Management: Mattison 1999, Tata McGraw-Hill


**SYLLABI**

**5yr Integrated Master of Comp. Applications**

**2015 admissions onwards**

**REFERENCE:**

Knowledge Management: Ganesh Natarajan, President & CEO Aptech

**15CSA339 LAN SWITCHING AND ADVANCED ROUTING 3 0 0 3**

**Unit 1**


**Unit 2**

Basic Switching Concepts and Configuration, Switch Security: Management and Implementation, VLANs.

**Unit 3**

Routing Concepts & operations, Configuration of a Router, Media Access Control, Inter-VLAN Routing, Layer 3 Switching, Static Routing Implementation, Configure Static and Default Routes, CIDR and VLSM.

**Unit 4**


**Unit 5**

Access Control Lists and operations, Configuring and Troubleshooting Standard & extended IPv4 ACLs, IPv6 ACLs, DHCPv4 (IPv4) DHCPv6(IPv6).

**TEXTBOOKS:**


**REFERENCES:**

1. Introduction to Networks-Course Booklet", Cisco Press

2. Routing and Switching Essentials – Course Booklet", Cisco Press

**15CSA340 MICROPROCESSOR SYSTEM 3 0 0 3**

**Unit 1**


**Unit 2**

Introduction to Microprocessor and microcomputers – General architecture of a
SYLLABI
5yr Integrated Master of Comp. Applications
2015 admissions onwards


Unit 3

Unit 4

Unit 5

TEXTBOOK:

REFERENCE BOOKS:
3. The 8086/88 family – John Uffenbeck – PHI

15CSA341 MULTIMEDIA AND GRAPHICS
3 0 0 3

Unit 1

Unit 2
Making instant Multimedia – Multimedia Authoring tools.

Unit 3

Unit 4
Multimedia Building Blocks: Animation – Video.

SYLLABI
5yr Integrated Master of Comp. Applications
2015 admissions onwards

Unit 5

TEXTBOOK:

REFERENCES:

15CSA343 SOCIAL AND PROFESSIONAL ISSUES IN COMPUTING
3 0 0 3

Unit 1
Social Context: Introduction to the social implications of computing, Social implications of networked communication, Growth of, Control of, and access to the Internet, Gender – Related issues, Cultural issues, International Issues, Accessibility Issues (e.g. underrepresentation of minorities, Women and disabled in the computing profession), Public policy issues (e.g. electronic voting).

Unit 2
Analytical Tools: Making and evaluating ethical arguments, Identifying and evaluating ethical choices, Understanding the social context of design, Identifying assumptions and values.

Professional Ethics: Community values and the laws by which we live, The nature of professionalism (Including care, attention and discipline, fiduciary responsibility, and mentoring).

Keeping up-to-date as a professional (in terms of knowledge, tools, skills, legal and professional framework as well as the ability to self-assess and computer fluency), Various forms of professional credentialing and the advantages and disadvantages, The role of the professional in public policy, Maintaining awareness of consequences, Ethical dissent and whistle-blowing.

Codes of ethics, conduct, and practice(IEEE, ACM, SE, AITP, and so forth), Dealing with harassment and discrimination, “Acceptable use” policies for computing in the work place.

Healthy Computing environment (ergonomics)

Unit 3
Risks: Historical examples of software risks (such as the Therac-25 case), Implications of software complexity, Risk assessment and Risk Management; Risk removal, risk reduction and risk control.


**Security Operations:** Physical security, Physical access controls, Personnel access controls, Operational security, Security polices for systems/networks, Recovery and Response, Dealing with problems (both technical and human)

**Unit 4**


Privacy and Civil Liberties: Ethical and legal basis for privacy protection, Ethical and legal framework for freedom of information, Privacy implications of database systems (e.g. Data gathering, storage and sharing, massive data collecting, computer surveillance systems)

Technological strategies for privacy protection, Freedom of expression in cyberspace, International and intercultural implications.

**Unit 5**


**TEXTBOOK:**

*Ethics for Information Age, 3rd Edition, Michael J. Quinn, Pearson/Addison Wesley, 2009*

15CSA346 SOFT COMPUTING 3 0 0 3

**Unit 1**


**Unit 2**

FUZZY sets, properties, Membership functions Fuzzy operations, Applications.

**Unit 3**

Classification and Regression Trees - Data Clustering Algorithms - Rule based Structure identification.

**Unit 4**

Neuro-Fuzzy Systems.

**Unit 5**

Evolutionary Computation - Survival of the Fittest - Fitness Computation – Crossover

TEXTBOOK/ REFERENCES:


15CSA346 SYSTEMS AND NETWORK ADMINISTRATION 3 0 0 3

**Unit 1**


**Unit 2**


**Unit 3**


**Unit 4**


**Unit 5**


Network Administration Lab.

SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

TEXTBOOKS
1. Red Hat Linux - System Administration

REFERENCE:

15CSA381 C# PROGRAMMING LAB. 0 0 3 1
1. Create an Animation using Timer Control
2. Create a Windows calculator
3. Create a Menu driven Notepad application
4. Create a Web browser with all menu options
5. Create a menu driven application to accept the details of employees, with fields
   EmpID, Name, Address, Department, Joining Date, and to display them. Give
   option for edition and deletion of employees and there must be option to navigate
   through the records. Give required validations.
6. Create a menu driven application for a super stores. Design two forms –
   Product Master and Purchase. Product master should have fields Product
   No., Name, Dealer Name, Expiry Date. Min reorder level, Stock. Purchase can
   be made for as many products u want and display the total amount. Give
   required validations.
7. Create a menu driven application for School Management System using
   connected approach frame a form to accept, edit, delete and search data.
8. Give option to display details in given criteria:
   i. Students of a given class with a given grade.
   ii. Students who are interested in a given hobby.
9. Create a Web site using ASP.NET for a student community. Provide provision
    for registering the student details
10. Rewrite the above site in XML web service. Provide different client programs
    for the same

15CSA385 COMPUTER GRAPHICS LAB. 0 0 3 1
1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for circle drawing as Raster Graphics Display.
3. Write a program to draw an ellipse using Mid Point Algorithm.
4. Write a program to draw a circle using Midpoint algorithm. Modify the same for
   drawing an arc and sector.
5. Write a program to rotate a point about origin.
6. Write a program to rotate a triangle about origin.
7. Write a program to scale the triangle.
8. Write a program to translate a triangle.
9. Write a program to reflect a triangle.

10. Write a program for polygon filling as Raster Graphics Display
11. Write a program for line clipping.
12. Write a program for polygon clipping.
13. Write a program for displaying 3D objects as 2D display using perspective
    transformation.
14. Write a program for rotation of a 3D object about arbitrary axis.
15. Write a program for Hidden surface removal from a 3D object.

This initiative is to provide opportunities for students to get involved in coming up with
solutions for societal problems. The students shall visit villages or rural sites during the
vacations (after second semester or fourth semester) and if they identify a worthwhile
project, they shall register for a 3-credit Live-in-Lab project, in the fifth semester. The
objectives and projected outcome of the project should be reviewed and approved by the
Dept. Chairperson and a faculty assigned as the project guide. On completion of
the project, the student shall submit a detailed project report. The report shall be
evaluated and the students shall appear for a viva-voce test on the project.

15CSA390 LIVE-IN-LAB. 2 cr

To expose the student to the industry-standard project practices, under time and
deliverable constraints, applying the knowledge acquired through various courses
done in the programme.

15CSA391 MINOR PROJECT 3 cr

The students those who are willing to exit the Integrated MCA Programme may
have to deliver an open seminar in any topic which they should have decided at
least month before the seminar. The topic should have been approved by the
Chairperson of the department.

15CSA397 COMPREHENSIVE TECHNICAL VIVA-VOCE 2 cr

The viva may be done based on every course covered till the sixth semester. The
objective of this is to enable the students to attend placements and be better
performers in their future.

15CSA399 PROJECT 6 cr

To allow students to develop their own ideas and get experienced in industrial and
research projects. It provides an opportunity in solving a real life problem by
applying the knowledge gained through various courses of study and an exposure
on different phases of software /system development life cycle.
**SYLLABI**

**5yr Integrated Master of Comp. Applications**

2015 admissions onwards

---

**SYLLABI**

**5yr Integrated Master of Comp. Applications**

2015 admissions onwards

---

**15CUL101**

**CULTURAL EDUCATION I**

2002

**Unit 1**
Introduction to Indian Culture - Introduction to Amma's life and Teachings - Symbols of Indian Culture.

**Unit 2**
Science and Technology in Ancient India - Education in Ancient India - Goals of Life - Purusharthas - Introduction to Vedanta and Bhagavad Gita.

**Unit 3**
Introduction to Yoga - Nature and Indian Culture - Values from Indian History - Life and work of Great Seers of India.

**TEXTBOOKS:**
1. *The Glory of India* (in-house publication)
2. *The Mother of Sweet Bliss, Amma’s Life & Teachings*

---

**15CUL111**

**CULTURAL EDUCATION II**

2002

**Unit 1**
1. Relevance of Sri Rama and Sri Krishna in this Scientific Age
2. Lessons from the Epics of India
3. Ramayana & Mahabharata

**Unit 2**
4. Who is a Wise Man?
5. A Ruler's Dharma
6. The Story of King Shibi

**Unit 3**
7. Introduction to the Bhagavad Gita
8. Bhagavad Gita – Action without Desire

**Unit 4**
9. Role and Position of Women in India
10. The Awakening of Universal Motherhood

**Unit 5**
11. Patanjali's Astanga - Yoga System for Personality Refinement
12. Examples of Heroism and Patriotism in Modern India

**TEXTBOOKS:**
*Common Resource Material II* (in-house publication)
*Santarana Dharma - The Eternal Truth* (A compilation of Amma’s teachings on Indian Culture)

---

**SYLLABI**

**5yr Integrated Master of Comp. Applications**

2015 admissions onwards

---

**15ENG101**

**COMMUNICATIVE ENGLISH**

2023

**Objectives:** To help the student to obtain ability to communicate in English; to impart an aesthetic sense and enhance creativity

**Unit 1**
Parts of Speech, Tenses, Prepositions, Determiners - Agreement (Subject – Verb, Pronoun - Antecedent), Phrasal Verbs, Modifiers, Linkers/Discourse Markers, Question Tags.

**Unit 2**
Paragraph writing – Cohesion - Development: definition, comparison, classification, contrast, cause and effect - Essay writing: Descriptive and Narrative.

**Unit 3**
Letter Writing - Personal (congratulation, invitation, felicitation, gratitude, condolence etc.) Official (Principal/ Head of the department/ College authorities, Bank Manager, Editors of newspapers and magazines).

**Unit 4**

**Unit 5**
Short Stories: Katherine Mansfield's A Cup of Tea – Kishori Charan Das’s Death of an Indian,
Poems: Maya Angelou's I Know Why the Caged Bird Sings - Sri Aurobindo's The Tiger and the Deer

**REFERENCES:**
5. Murphy, Raymond, *Murphy's English Grammar*, CUP, 2004
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

15ENG121 PROFESSIONAL COMMUNICATION  1 0 2  2

Objectives: To convey and document information in a formal environment; to acquire the skill of self-projection in professional circles; to inculcate critical thinking and to improve aesthetic sense.

Unit 1
Vocabulary Building: Prefixes and Suffixes; One word substitutes, Modal auxiliaries, Error Analysis: Position of Adverbs, Redundancy, Dangling modifiers – Reported Speech

Unit 2
Instruction, Suggestion & Recommendation - Graphical Interpretation: Extracting data from charts and graphs - Essay writing: Analytical and Argumentative

Unit 3
Circulars, Memos – Business Letters - e-mails

Unit 4

Unit 5
Listening and Reading Practice - Book Review

REFERENCES:
1. Felixa Eskey Tech Talk, University of Michigan. 2005

15ENV300 ENVIRONMENTAL SCIENCE AND SUSTAINABILITY  3 0 0  3

Unit 1
State of Environment and Unsustainability, Need for Sustainable Development, Traditional conservation systems in India, People in Environment, Need for an attitudinal change and ethics, Need for Environmental Education, Overview of International Treaties and Conventions, Overview of Legal and Regulatory Frameworks.

Environment: Abiotic and biotic factors, Segments of the Environment, Biogeochemical Cycles, Ecosystems (associations, community adaptations, ecological succession, Food webs, Food chain, ecological pyramids), Types of Ecosystems – Terrestrial ecosystems, Ecosystem Services, Economic value of ecosystem services, Threats to ecosystems and conservation strategies.


15HIN101  HINDI I  1 0 2 2

Objectives: To teach Hindi for effective communication in different spheres of life: Social context, Education, governance, Media, Business, Profession and Mass communication.

Unit 1
Introduction to Hindi Language - National Language, Official Language, link Language etc. Introduction to Hindi language, Devanagari script and Hindi alphabet.

Shabda Bhed, Roopantar ki Drishti se - Bhasha – Paribhasha aur Bhed - Sangya - Paribhasha Aur Bhed - Sangya ke Roopantar - kriya.

Unit 2
Common errors and error corrections in Parts of Speech with emphasis on use of pronouns, Adjective and verb in different tenses – Special usage of adverbs, changing voice and conjunctions in sentences, gender & number - General vocabulary for conversations in given context – understanding proper pronunciation – Conversations, Interviews, Short speeches.

Unit 3
Poems – Kabir Ist 8 Dohas, Surdas 1st 1 Pada; Tulsidas 1st 1 Pada; Meera 1st 1 Pada.

Unit 4

Unit 5
Kahani – Premchand: Kafan, Abhilasha, Vidroh, Poos ki rath, Juloos.

TEXTBOOKS:
1. Prem Chand Ki Srvashrestha Kahaniyam: Prem Chand; Diamond Pub Ltd. New Delhi
2. Vyavaharik Hindi Vyakaran, Anuvad thaha Rachana: Dr. H. Parameswaran, Radhakrishna publishing House, New Delhi

15HIN111  HINDI II  1 0 2 2

Objectives: Appreciation and assimilation of Hindi Literature both disiya & shravya using the best specimens provided as anthology.

15KAN101  KANNADA I  1 0 2 2

Objectives: To enable the students to acquire basic skills in functional language; to develop independent reading skills and reading for appreciating literary works; to analyse language in context to gain an understanding of vocabulary, spelling, punctuation and speech.

Unit 1
Adalitha Kannada: bhashe, swaroopa, belavangeya kiru parichaya Paaribhaashika padagalu Vocabulary Building

Unit 2

Unit 3
Mochi – Bharateepriya Mosarina Mangamma – Maasti Venkatesh Iyengar Kamalaapurada Hotelnalli – Panje Mangesh Rao
2015 admissions onwards
SYLLABI
5yr Integrated Master of Comp. Applications

Kaanike – B. M. Shree
Geleyanobbanige bareda Kaagada – Dr. G. S. Shivarudrappa
Moodala Mane – Da. Ra. Bendre
Swathantryada Hanate – K. S. Nissaar Ahmed

Unit 4
Letter Writing - Personal: Congratulation, thanks giving, invitation, condolence

Unit 5
Reading Comprehension; nudigattu, gaadegalu
Speaking Skills: Prepared speech, pick and speak

REFERENCES:
1. H. S. Krishna Swami Iyangar – Adalitha Kannada – Chetana Publication, Mysuru
2. A. N. Murthy Rao – Aleyuva Mana – Kuvempu Kannada Adyayana Samste
3. Nemi Chandra – Badhuku Badalisabahudu – Navakarnataka Publication
4. Sanna Kathegalu - Prasaranga, Mysuru University , Mysuru
5. B. M. Shree – Kannadada Bavuta – Kannada Sahitya Parishattu
6. K. S. Nissar Ahmed – 75 Bhaavageetegalu – Sapna Book House (P) Ltd.
7. Dr. G. S. Shivarudrappa – Samagra Kavya – Kamadhenu Pustaka Bhavana

15KAN111
KANNADA II

Objectives: To enable the students to acquire basic skills in functional language; to develop independent reading skills and reading for appreciating literary works; to develop functional and creative skills in language; to enable the students to plan, draft, edit & present a piece of writing.

Unit 1
Official Correspondence: Adhikrutha patra, prakatane, manavi patra, vanijya patra

Unit 2
Nanna Hanate - Dr. G. S. Shivarudrappa
Ella Marethiruvaga - K. S. Nissaar Ahmed
Saviraru Nadigalu – S Siddalingayya

Unit 3

Unit 4
Sarva Sollegala turtu Maha Samelana - Beechi
Swarthakkaagi Tyaga - Beechi

SYLLABI
5yr Integrated Master of Comp. Applications

Unit 5
Essay writing: Argumentative & Analytical
Précis writing

REFERENCES:
1. H. S. Krishnaswami Iyangar – Adalitha Kannada – Chetana Publication, Mysuru
2. Dr. G. S. Shivarudrappa – Samagra Kavya - Kamadhenu Pustaka Bhavana
4. K. S. Nissar Ahmed – 75 Bhaavageetegalu – Sapna book house
5. Dr. Da. Ra. Bendre – Saayo Aata – Shri Maata Publication

15MAL101
MALAYALAM I

Objectives: To appreciate the aesthetics & cultural implications; to enhance creative thinking in mother-tongue; to learn our culture & values; to equip students read & write correct Malayalam; to correct the mistakes in pronunciation; to create awareness that good language is the sign of complete personality.

Unit 1
Ancient poet trio: Adhyatmaramayanam, Lakshmana Swanthanam (valsa soumitre... mungikidakayal), Ezuthachan - Medieval period classics – Jnanappana (kalaminnu... vilasangalingane), Poonthanam.

Unit 2

Unit 3
Short stories from period 1/2/3, Poovanpazham - Vaikaom Muhammed Basheer - Literary & Cultural figures of Kerala and about their literary contributions.

Unit 4

Unit 5
Error-free Malayalam: 1. Language; 2. Clarity of expression; 3. Punctuation.
Thettillatha Malayalam – Writing - a. Expansion of ideas; b. Precise Writing; c. Essay Writing; d. Letter writing; e. Radio Speech; f. Script/ Feature/ Script Writing; g. News Editing; h. Advertising; i. Editing; j. Editorial Writing; k. Critical appreciation of literary works (Any one or two as an assignment).
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

REFERENCES:

15MAL111 MALAYALAM II 1022

Objectives: To appreciate the aesthetics & cultural implications; to enhance creative thinking in mother-tongue; to learn our culture & values; to equip students read & write correct Malayalam; to correct the mistakes in pronunciation; to create awareness that good language is the sign of complete personality.

Unit 1
Ancient poet trio: Kalayanasougandhikam, (kallum marangalun... namukkenarika vrikodara) Kunjan Nambiar - Critical analysis of his poetry - Ancient Drama: Kerala Sakunthalam (Act 1), Kalidasan (Translated by Attor Krishna Pisharody).

Unit 2

Unit 3

Unit 4
Part of an autobiography/ travelogue: Kannerum Kinavum, V. T. Bhattathirippadu - Socio-cultural literature - historical importance.

Unit 5
Error-free Malayalam: 1. Language; 2. Clarity of expression; 3. Punctuation.

Thettillatha Malayalam – Writing - a. Expansion of ideas; b. Precis Writing; c. Essay Writing; d. Letter writing; e. Radio Speech; f. Script/ Feature/ Script Writing; g. News Editing; h. Advertising; i. Editing; j. Editorial Writing; k. Critical appreciation of literary works (Any one or two as an assignment).

REFERENCES:

SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards


15MAT103 MATHEMATICAL FOUNDATIONS 2103

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5

TEXTBOOK:
P. R. Vittal - Business Mathematics and Statistics, Margham Publications, Chennai,

REFERENCE:
S. P. Gupta – Statistical Methods - Sultan Chand and Sons - Educational Publishers, New Delhi

15MAT115 STATISTICAL AND NUMERICAL METHODS 3104

Statistical Methods
Unit 1
Correlation - karl pearson’s and Spearman’s rank correlation, Regression - regression equations, regression coefficients.

Unit 2
Interpolation - Newton’s forward & backward method - Lagrange’s Method, Curve fitting - fitting a straight line.

Arts and Sciences
Unit 3
Permutations – combinations – Probability - addition theorem, multiplication theorem, independent events, conditional probability, Baye’s theorem, Probability distribution - Binomial, Poisson, normal.

Numerical methods
Unit 4

Unit 5

TEXTBOOK:
H. S. Hall and S. R. Knight - Higher Algebra – AITBS Publishers India

REFERENCES:

15MAT223 DISCRETE MATHEMATICS 2 1 0 3

Unit 1
Propositional Logic, Equivalences, Predicates and Quantifiers, Sets, Functions and growth of functions.

Unit 2
Basic Counting Principles, Generating Functions, Recurrence Relations, Inclusion exclusion Principles, Euler’s phi-function and its Application to Cryptography.

Unit 3
Relations and their properties, n-ary relations, Equivalence relations.

Unit 4
Advanced Counting Techniques: Recurrence relations, Solving Linear Recurrence relations, Divide and Conquer Algorithms and Recurrence relations, Generating Functions, Inclusion and Exclusion and their Applications.

Unit 5
Introduction to Graph Theory: Graphs, Bipartite Graphs, Eulerian and Hamiltonian Graphs, Graph Connectivity, Shortest path algorithm, Planar Graphs, Vertex coloring.

TEXTBOOK:

REFERENCES:

15SAN101 SANSKRIT I 1 0 2 2

Objectives: To familiarize students with Sanskrit language and literature; to enable them to read and understand Sanskrit verses and sentences; to help them acquire expertise for self-study of Sanskrit texts and communication in Sanskrit; to help the students imbibe values of life and Indian culture as propounded in scriptures.

Unit 1
Introduction to Sanskrit language, Devanagari script - Vowels and consonants, pronunciation, classification of consonants, conjunct consonants, words – nouns and verbs, cases – introduction, numbers, Pronouns, communicating time in Sanskrit. Practical classes in spoken Sanskrit.

Unit 2

Unit 3
Words for communication, slokas, moral stories, subhashithas, riddles (from the books prescribed).

Unit 4
Selected slokas from Valmiki Ramayana, Kalidasa’s works and Bhagavad Gita. Ramayana – chapter VIII - verse 5; Mahabharata - chapter 174, verse 16; Bhagavad Gita – chapter IV - verse 8; Kalidasa’s Sakuntalam - Act IV – verse 4.

Unit 5
Translation of simple sentences from Sanskrit to English and vice-versa.

ESSENTIAL READINGS:
1. Praveshaha; Publisher: Samskrita bharati, Aks haram, 8th cross, 2nd phase, girinagar, Bangalore-560 085
2. Sanskrit Reader I, II and III, R. S. Vadhya and Sons, Kalpathi, Palakkad

15OEL231 - 2xx OPEN ELECTIVES 3 0 0 3

Open electives syllabi - see at the end of the booklet.
3. Prakriya Bhashyam written and published by Fr. John Kunnappally
4. Sanskrit Primer by Edward Delavan Perry, published by Ginn and Company Boston
5. Sabdamanjari, R. S. Vadyar and Sons, Kalpathi, Palakkad
6. Namalinganusasanam by Amarasimha published by Travancore Sanskrit series

**SYLLABI 5yr Integrated Master of Comp. Applications**  
**2015 admissions onwards**

15SAN111 SANSKRIT II

**Objectives:** To familiarize students with Sanskrit language and literature; to enable them to read and understand Sanskrit verses and sentences; to help them acquire expertise for self-study of Sanskrit texts and communication in Sanskrit; to help the students imbibe values of life and Indian culture as propounded in scriptures.

**Unit 1**
Seven cases, indeclinables, sentence making with indeclinables, Saptha karakas.

**Unit 2**
Ktavatu Pratyaya, Upasargas, Ktvanta, Tumunnanta, Lyabanta.
Three Lakaras – brief introduction, Lot lakara.

**Unit 3**
Words and sentences for advanced communication. Slokas, moral stories (Panchatantra) Subhashitas, riddles.

**Unit 4**
Introduction to classical literature, classification of Kavyas, classification of Dramas - The five Mahakavyas, selected slokas from devotional kavyas - Bhagavad Gita – chapter II verse 47, chapter IV verse 7, chapter VI verse 5, chapter VIII verse 6, chapter XVI verse 21, Kalidasa’s Sakuntala act IV verse 4, Isavasyopanishat 1st Mantra, Mahabharata chapter 149 verses 14 - 120, Neetisara chapter – III.

**Unit 5**
Translation of paragraphs from Sanskrit to English and vice-versa.

**ESSENTIAL READINGS:**
1. Praveshaha; Publisher: Samskrita bharati, Aksharam, 8th cross, 2nd phase, girinagar, Bangalore-560 085
2. Sanskrit Reader I, II and III, R. S. Vadhyar and Sons, Kalpathi, Palakkad
3. Prakriya Bhashyam written and published by Fr. John Kunnappally
4. Sanskrit Primer by Edward Delavan Perry, published by Ginn and Company Boston
5. Sabdamanjari, R. S. Vadyar and Sons, Kalpathi, Palakkad
6. Namalinganusasanam by Amarasimha published by Travancore Sanskrit series

**SYLLABI 5yr Integrated Master of Comp. Applications**  
**2015 admissions onwards**

15SSK201 LIFE SKILLS I

**Objectives:** Soft skills and its importance: Pleasure and pains of transition from an academic environment to work-environment. Need for change. Fears, stress and competition in the professional world. Importance of positive attitude, self-motivation and continuous knowledge upgradation.

Self Confidence: Characteristics of the person perceived, characteristics of the situation, Characteristics of the Perceiver. Attitude, Values, Motivation, Emotion Management, Steps to like yourself, Positive Mental Attitude, Assertiveness.

Presentations: Preparations, Outlining, Hints for efficient practice, Last minute tasks, means of effective presentation, language, Gestures, Posture, Facial expressions, Professional attire.

Vocabulary building: A brief introduction into the methods and practices of learning vocabulary. Learning how to face questions on antonyms, synonyms, spelling error, analogy etc. Faulty comparison, wrong form of words and confused words like understanding the nuances of spelling changes and wrong use of words.

Listening Skills: The importance of listening in communication and how to listen actively.

Prepositions and Articles: A experiential method of learning the uses of articles and prepositions in sentences is provided.

Problem solving; Number System; LCM &HCF; Divisibility Test; Surds and Indices; Logarithms; Ratio, Proportions and Variations; Partnership; Time speed and distance; work time problems;

Data Interpretation: Numerical Data Tables; Line Graphs; Bar Charts and Pie charts; Caselet Forms; Mix Diagrams; Geometrical Diagrams and other forms of Data Representation.

Logical Reasoning: Family Tree; Linear Arrangements; Circular and Complex Arrangement; Conditionalities and Grouping; Sequencing and Scheduling; Selections; Networks; Codes; Cubes; Venn Diagram in Logical Reasoning.

**TEXTBOOKS:**

**REFERENCES:**
1. Quantitative Aptitude, by R S Aggarwal, S Chand Publ.
### LIFE SKILLS II

**15SSK211**


Group Discussions: Advantages of Group Discussions, Structured GD – Roles, Negative roles to be avoided, Personality traits to do well in a GD, Initiation techniques, How to perform in a group discussion, Summarization techniques.

Listening Comprehension advanced: Exercise on improving listening skills, Grammar basics: Topics like clauses, punctuation, capitalization, number agreement, pronouns, tenses etc.

Reading Comprehension advanced: A course on how to approach middle level reading comprehension passages.

Problem solving – Money Related problems; Mixtures; Symbol Based problems; Clocks and Calendars; Simple, Linear, Quadratic and Polynomial Equations; Special Equations; Inequalities; Functions and Graphs; Sequence and Series; Set Theory; Permutations and Combinations; Probability; Statistics.

Data Sufficiency: Concepts and Problem Solving.

Non-Verbal Reasoning and Simple Engineering Aptitude: Mirror Image; Water Image; Paper Folding; Paper Cutting; Grouping Of Figures; Figure Formation and Analysis; Completion of Incomplete Pattern; Figure Matrix; Miscellaneous.

Special Aptitude: Cloth, Leather, 2D and 3D Objects, Coin, Match Sticks, Stubs, Chalk, Chess Board, Land and geodesic problems etc., Related Problems.

### LIFE SKILLS III

**15SSK301**

Team Work: Value of Team work in organisations, Definition of a Team, Why Team, Elements of leadership, Disadvantages of a team, Stages of Team formation, Group Development Activities: Orientation, Internal Problem Solving, Growth and Productivity, Evaluation and Control, Effective Team Building: Basics of Team Building, Teamwork Parameters, Roles, Empowerment, Communication, Effective Team working, Team Effectiveness Criteria, Common characteristics of Effective Teams, Factors affecting Team Effectiveness, Personal characteristics of members, Team Structure, Team Process, Team Outcomes.

Facing an Interview: Foundation in core subject, Industry Orientation/ Knowledge about the company, Professional Personality, Communication Skills, activities before interview, upon entering interview room, during the interview and at the end. Mock interviews.

Advanced Grammar: Topics like parallel construction, dangling modifiers, active and passive voices, etc.

Syllogisms, Critical reasoning: A course on verbal reasoning, Listening Comprehension advanced: An exercise on improving listening skills.

Reading Comprehension advanced: A course on how to approach advanced level of reading, comprehension passages. Exercises on competitive exam questions. Specific Training: Solving campus recruitment papers, National level and state level competitive examination papers; Speed mathematics; Tackling aptitude problems asked in interview; Techniques to remember (In Mathematics), Lateral Thinking problems. Quick checking of answers techniques; Techniques on elimination of options, Estimating and predicting correct answer; Time management in aptitude tests; Test taking strategies.
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

TEXTBOOKS:
4. The Hard Truth about Soft Skills, by Amazon Publication.

REFERENCES:
1. Speed Mathematics, Secrets of Lightning Mental Calculations, by Bill Handley, Master MInd books;
2. The Trachtenberg Speed System of Basic Mathematics, Rupa & Co., Publishers;
5. Quick Arithmetics, by Ashish Agarwal, S Chand Publ.;
8. The BBC and British Council online resources
9. Owl Purdue University online teaching resources
10. www.thegrammarbook.com online teaching resources
11. www.englishpage.com online teaching resources and other useful websites.

1STAM101 TAMIL I 1 0 2 2

Objectives: To introduce the students to different literature - Sangam literature, Epics, Bhakti literature and modern literature; to improve their ability to communicate with creative concepts, and also to introduce them to the usefulness of basic grammatical components in Tamil.

Unit 1	Sangam literature: Kuruntokai; (2, 6, 8, 40 pātalikal) – puranāngu (74, 112, 184, 192 pātalikal) – tirukkural (īḻaimāṭçi, amaiçu).

Unit 2	Epic literature: cilappatikāram maturaik kāṉṭam (valakkuṟaikkātai 50-55).

Spiritual Literature: tiruppāvai (3, 4) – tēvāram (māḷvilāniyum)

Medieval Literature: bāratiyar kaṇṇaṟ pāṭtu (eḻ vilaiyattu pillai) – bāratiyaccang kulampavaiḷku (taiti) taittṟu).

Unit 3
Novel: Jeeyakāntap “kurri pittam”

Essay: Āṭā “e tāḷṇta tamiḻakamē”

Unit 4
Tirumāḷa coriyalai – tirumāḷaṟuṟkkaṟaṟai – cōrallas – māṇṭiṟṟa vēnkalai – avṟṟāi – tirumāḷaṟuṟkkaṟaṟai dēvr cōrallas coriyalai tōṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

Syllabi 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 5
Tamil Grammar Čal vākaṟkal - uṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

Practical skills: Listening, speaking, writing and reading.

TEXTBOOKS:
Aṇṇā "ē tāḷṇta tamiḻakamē" nakkūṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

REFERENCES:
Aṭā “ē tāḷṇta tamiḻakamē” nakkūṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 1
The history of Tamil literature: Nāṭṭṭṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

Unit 2
tinai ilekkiyamam nīṭṭirṇaḷkkiyamam - patēnṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

Essay: Āṭā “e tāḷṇta tamiḻakamē”

Unit 4
Tirumāḷa coriyalai – tirumāḷaṟuṟkkaṟaṟai – cōrallas – māṇṭiṟṟa vēnkalai – avṟṟāi – tirumāḷaṟuṟkkaṟaṟai dēvr cōrallas coriyalai tōṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṟṛṛ

Art: AMRITA VISHWA VIDYAPEETHAM S 65
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

Unit 3
tamil ilakkanam: Vaikkaya vaalaiKa| tapani lo pirivinai narkikanu arezhuru.

Unit 4

Unit 5
tamil moli ayil kanini payappatu - Karuttu paramaRat - vilampara moliyamaippu - paEcu - natakam pataippu - cirukatai, katai, putinam pataippu.

TEXTBOOKS:
http://www.hn.mathamath.com/2013/07/mining.html
http://www.gn.mathamath.com/2013/07/mining.html
Mu. Marelaanilag | "tamil ilakka vaalayu" vaalayu akatavai vaalayu, 2012
nai. Vaipamamalai, "tamil natuWappatakal" nii cecci putakka veIliffakam 1964, 2006
paO maninjag | "stOg tamil ilakkanam" stOg pappilO kuttiiP, varivelu, biruvaru, antapiPramam, 2007.

16CA303 ADVANCED COMPUTER NETWORKING 3 0 3 4
AND INTERNET
Overview - The Network Edge - The Network Core - Delay - Loss and Throughput in Packet Switched Networks - Application layer protocols - HTTP - DNS - PPP file sharing.


SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

TEXTBOOKS/REFERENCES:

16CA303 DESIGN AND ANALYSIS OF ALGORITHMS 3 1 0 4

Analysis of iterative programs, Analysis of recursive programs: Recurrence Relation: Substitution method, Recursion Tree Methods, Master Method.


Greedy Algorithm: Fractional Knap-sack Problem - Task Scheduling Problem.

Dynamic Programming: Matrix Multiplication Problem - 0/1 Knap-sack Problem.


Graph Algorithms: Graph Traversals (DFS, BFS with Analysis) - Shortest Path Algorithms (with Analysis) – Dijkstra - Bellman Ford - Floyd Warshall’s all Pair shortest path Algorithm - Minimum spanning Tree (with Analysis) – Kruskal – Prims.

NP Problems: Definition: P-NP-NP Complete-NP Hard. Examples: P-NP.

TEXTBOOKS/REFERENCES:
16CA304  SERVICE-ORIENTED ARCHITECTURE  3 0 3 4


TEXTBOOKS/ REFERENCES:

16CA305  ADVANCED SOFTWARE ENGINEERING  3 0 3 4


Software Testing - Strategic Approach to Software Testing, Test Strategies for conventional and Object Oriented Software - Validation Testing - System Testing –
Evaluation metrics – Precision, Recall, F-measure.


TEXTBOOKS/ REFERENCES:
1. Jiawei Han, Micheline Kamber and Jian Pei, “Data mining concepts and Techniques”, Third Edition, Elsevier Publisher, 2006.

16CA307 BASICS OF OPERATIONS RESEARCH


Transportation and its Variants: Definition - Transportation Algorithms and Solutions - Assignment Model - Hungarian Method - Traveling Salesman Problem - Transshipment Model.


Inventory Theory: Cost Involved in Inventory Problems - Single Item Deterministic Models - Economic Size Model with and without Shortages having Production Rate Infinite and Finite.

TEXT BOOKS/ REFERENCES:

16CA308 ADVANCED DATABASES

Introduction to Object Oriented Database: Abstraction, encapsulation, and information hiding, Classes, Inheritance Overloading Polymorphism and dynamic binding - Object-Oriented Data Model.

Complex Data Types – Structured Types and Inheritance in SQL – Table Inheritance – Array and Multiset Types in SQL – Object-Identity and Reference Types in SQL – Implementing OR Features – Persistent Programming Languages – Object – Relational Mapping.


Spatial and Temporal Data and Mobility: Time in Databases – Spatial and Geographic Data – Multimedia Databases – Mobility and Personal Databases.

Concepts of NoSQL Databases.
16CA314 INFORMATION SECURITY 3003


TEXTBOOKS/ REFERENCES:

16CA316 STRUCTURE AND INTERPRETATION OF COMPUTER PROGRAMS

Introduction to the Elements of Programming Languages: Different Types of Programming Languages - Modeling Programming Languages, Computability versus Complexity, Computer Science for Computation.

Introduction to LISP and Scheme - Building Abstractions with Procedures - The Elements of Programming Procedures and the Process they Generate – Formulating Abstractions with Higher-Order Procedures.


TEXTBOOKS/ REFERENCES:
Software CMM and other Process Improvement Models - Software Configuration Management

Introduction to Six Sigma - Case Studies: Indian Software Industry in Perspective.

**TEXTBOOKS/ REFERENCES:**

**16CA322 COMPUTATIONAL INTELLIGENCE 3 0 0 3**

Artificial Intelligence – a Brief Review – Pitfalls of Traditional AI – Need for Computational Intelligence – Importance of Tolerance of Imprecision and Uncertainty - Constituent Techniques – Overview of Artificial Neural Networks - Fuzzy Logic - Evolutionary Computation.


Neural Networks as Associative Memories - Hopfield Networks, Bidirectional Associative Memory. Topologically Organized Neural Networks – Competitive Learning, Kohonen Maps.


Evolutionary Computation - Constituent Algorithms. Swarm.

Intelligence Algorithms - Overview of other Bio-inspired Algorithms - Hybrid Approaches (Neural Networks, Fuzzy Logic, Genetic Algorithms etc.).

**TEXTBOOKS/ REFERENCES:**

**SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards**

**16CA324 BIO-INFORMATICS 3 0 0 3**

Introduction to Bioinformatics: Definition - Importance and Uses of Bioinformatics-Information Technology - Systems Biology.


Applications of Data Mining to Bioinformatics Problems - Biological Data – Databases - Protein Sequencing - Nucleic Acid Sequencing - Sequence to Structure Relationship.


Introduction to Graph Matching Algorithms - Automated Genome Comparison and its Implication - Automated Gene Prediction - Automated.


**TEXTBOOKS/ REFERENCES:**

**16CA328 INFORMATION RETRIEVAL 3 0 0 3**


TEXTBOOKS/ REFERENCES:

16CA334 INTELLIGENT SYSTEMS 3 0 0 3

Introduction to Agents: Structure of Intelligent Agents – Problem Solving Agents - Formulating Problems.


Decision Network - Value of Information - Learning Agents – Learning from Observations – Knowledge in Learning - Case Studies on Applications of AI.

TEXTBOOKS/ REFERENCES:

16CA336 OPEN SOURCE SYSTEMS 3 0 0 3


TEXTBOOKS/ REFERENCES:

16CA338 NATURAL LANGUAGE PROCESSING 3 0 0 3


TEXTBOOKS/ REFERENCES:

16CA401  SOFTWARE ARCHITECTURE  3 1 0 4

Definition of Software Architecture - Importance of Software Architecture - The Many Contexts of Software Architecture.


TEXTBOOKS/ REFERENCES:
4. Alan Shalloway and J R Trott, Design Patterns Explained, Pearson, 2004

16CA403  SYSTEM SECURITY  3 1 0 4


16CA413  DISTRIBUTED COMPUTING  3 0 0 3

Introduction to Distributed Systems – Primitives for Distributed Communication – Design Challenges – Distributed Systems like Models for Distributed Computations.


Distributed Query Processing: Overview of Query Processing – Transforming Global Queries to Fragment Queries - Query Decomposition - Localization of Distributed data. Distributed Transaction Processing and Concurrency Control – 2PC - 3PC.


16CA417 WIRELESS COMMUNICATIONS AND NETWORKS 3 0 0 3


Wireless Routing Protocols: Infrastructure, AdHoc Networks, ProActive vs. ReActive, Dynamic Source Routing (DSR), AdHoc On Demand Distance Vector (AODV), Temporarily Ordered Routing Algorithm (TORA), Destination Sequenced Distance Vector (DSDV).

Case Study using NS2 / NS3.

Semantic Analysis: Symbol Table, Type Checking using Abstract Syntax Tree, Type Checking using Attributed Grammars.

Activation Records: Structure of Frames. Intermediate Representation: Conversion to IR Trees

Canonicalization of IR Trees and Three Address Code – Basic Block and Traces.

**TEXTBOOKS/REFERENCES:**

**16CA423 SEMANTIC WEB TECHNOLOGIES 3 0 0 3**


Knowledge Representation: Languages - Formalisms, Logics - Description Logics - Ontology Design and Management using the Protege Editor - Ontology Reasoning with Pellet/FACT++, Ontology Querying with SPARQL.

**16CA425 CLOUD COMPUTING 3 0 0 3**


**TEXTBOOKS/REFERENCES:**

**16CA429 DATABASE ADMINISTRATION 3 0 0 3**

Syllabi 5yr Integrated Master of Comp. Applications 2015 admissions onwards


Textbooks/ References:

16CA431 Digital Image Processing 3 0 0 3


Textbooks/ References:

16CA433 Business Intelligence 3 0 0 3


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

Introduction to Multi-Dimensional Data Modeling - Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi-dimensional modeling.

OLAP operations, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, OLAP Servers – MOLAP, ROLAP. OLAP query model and query processing, indexing OLAP Data, Data Warehouse Implementation.

Introduction to business metrics and KPIs, creating cubes using SSAS. Basics of Enterprise Reporting - Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to SSRS Architecture, enterprise reporting using SSRS.

Textbooks/ References:
2. Jiawei Han, Micheline Kamber and Jian Pei, “Data mining concepts and Techniques”, Third Edition, Elsevier Publisher, 2006.


16CA435 NETWORK MANAGEMENT AND SYSTEM ADMINISTRATION


TEXTBOOKS/ REFERENCES:
SYLLABI 5yr Integrated Master of Comp. Applications 2015 admissions onwards

**16CA439 MODERN WEB APPLICATION DEVELOPMENT USING MEAN STACK**

1. Basics of HTML, CSS, and Javascript
   HTML, CSS, Bootstrap, Javascript basics – Variables, functions, and scopes, Logic flow and loops, Events and Document object model, Handling JSON data, Understanding JSON callbacks.

2. Introduction to Node JS
   Installation, Callbacks, Installing dependencies with npm, Concurrency and event loop fundamentals, Node JS callbacks, Building HTTP server, Importing and exporting modules, Building chat application using web socket.

3. Building REST services using Node JS
   REST services, Installing Express JS, Express Node project structure, Building REST services with Express framework, Routes, filters, template engines - Jade, ejs.

4. MongoDB Basics and Communication with Node JS
   Installation, CRUD operations, Sorting, Projection, Aggregation framework, MongoDB indexes, Connecting to MongoDB with Node JS, Introduction to Mongoose, Connecting to MongoDB using mongoose, Defining mongoose schemas, CRUD operations using mongoose.

5. Building Single Page Applications with AngularJS
   Single Page Application – Introduction, Two-way data binding (Dependency Injection), MVC in Angular JS, Controllers, Getting user input, Loops, Client side routing – Accessing URL data, Various ways to provide data in Angular JS – Services and Factories, Working with filters, Directives and Cookies, The digest loop and use of $apply.

**16CA451 DATA STRUCTURES AND ALGORITHMS LAB.**

Posteriori analysis of iterative and recursive algorithms, plotting of growth rate. Implementation of singly linked list, doubly linked list, circular linked list. Stack and Queue implementation using array and SLL, comparison of efficiencies, Applications of Stack and Queue – Infix to postfix, postfix expression evaluation, Implementation of Polynomial ADT using SLL.

Binary search tree implementation. Heap implementation using array, Heap sort, Implementation of sorting algorithms – Bubble sort, Insertion Sort, Selection Sort, Quick Sort - Merge Sort, performance comparison of sorting algorithms for various classes of inputs like nearly sorted, unsorted etc.

**16CA452 JAVA PROGRAMMING**


**TEXTBOOKS/ REFERENCES:**

**16CA453 GUI PROGRAMMING USING VB.NET**

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET - Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming - Methods and events.

The VB.NET Language - Variables - Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function.

Control flow statements: conditional statement, loop statement, MsgBox & Inputbox. Working with Forms: Loading, showing and hiding forms, GUI Programming with Windows Form: Common Controls, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar. Properties, Methods and events. OpenFileDialog, SaveFileDialog, Font
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>16CA455</td>
<td>WEB DEVELOPMENT USING ASP.NET</td>
<td>3</td>
</tr>
<tr>
<td>16CA456</td>
<td>DATABASE MANAGEMENT SYSTEMS LAB.</td>
<td>3</td>
</tr>
<tr>
<td>16CA457</td>
<td>OPERATING SYSTEMS LAB.</td>
<td>3</td>
</tr>
</tbody>
</table>

**SYLLABI**

### 5yr Integrated Master of Comp. Applications

#### 2015 admissions onwards


**TEXTBOOKS/REFERENCES:**

1. Vb.net programming black book by Steven Holzner – Dreamtech publications
2. Mastering vnet.net by Evangelos Petroutsos - bpb publications Introduction to .net framework - Wrox publication

16CA454 ANDROID APPLICATION DEVELOPMENT 0031

Menu, Dialog, List and Adapters
What is Menu? - Custom Vs. System Menus - Creating and Using Handset menu Button (Hardware) - What are Android Themes? What is Dialog? How to create an Alter Dialog?

List & Adapters
Database SQLLite
Introducing SQLite - SQLiteOpenHelper and creating a database - Opening and closing a database

Working with cursors Inserts, updates and deletes
Location Based Services and Google Maps
Using Location Based Services - Working with Google Maps

Multimedia Programming using Android
Multimedia audio formats - Creating and Playing - Multimedia audio formats - Kill/Releasing (Memory Management) - How to associate audio in any application - How to associate video playback with an event

WebView
How to develop your own custom made Web browser - How to use WebView object in XML
Permission for using the Internet - Methods for associated with ‘Go’, ‘Back’, ‘Forward’ etc

**TEXTBOOKS/REFERENCES:**

Head first Android Development

16CA455 WEB DEVELOPMENT USING ASP.NET 0031

Understanding role of Web Server and Web Browser - Form Tag and comparison between Get and Post methods - Understanding HTML Form Tag and elements within it.

ASP.NET Introduction - First ASP.NET Application - Auto Postback Property - Event Handler Parameters - Comparison between HtmlControls and WebControls - ASP.NET Architecture

Life Cycle of ASP.NET Page - Master Pages - Validation Controls - ASP.NET State Management – Cookies - HttpCookie – Sessions – HttpSessionState

Application – HttpApplicationState – Web Configuration File and Global.asax - Data Bound Controls - Publishing Web Application

Creating web application in IIS - Using Virtual Directory - Publishing ASP.NET Website.

16CA456 DATABASE MANAGEMENT SYSTEMS LAB. 0031

Table Design - Data Definition Language (DDL) commands - Table creation and alter (include integrity constraints such as primary key, referential integrity constraints, check, unique and null constraints both column and table level, Drop - Other database objects such as view, index, cluster, sequence, synonym etc. - Practice SQL Data Manipulation Language (DML) commands - Row insertion, deletion and updating - Retrieval of data - Simple select query - Select with where options (include all relational and logical operators) - Functions: Numeric, Data, Character, Conversion and Group functions with having clause - Set operators - Sorting data - Sub query (returning single row, multiple rows, more than one column, correlated sub query) - Joining tables (single join, self-join, outer join) - Data manipulations using date functions - User defined functions in a query - Transaction Control Language (TCL) commands (Grant, revoke, commit and save point options) - Usage of triggers, functions and procedures using PL/SQL constructs.

16CA457 OPERATING SYSTEMS LAB. 0031

### COMPUTER ORGANIZATION AND ARCHITECTURE LAB.


### WEB AND XML PROGRAMMING USING JAVA AND J2EE


### DISSERTATION – PHASE 1 5 cr

The objective of Dissertation – Phase 1 is to gear up students for preparation of Dissertation - Phase 2 in Semester X. Dissertation provides an opportunity to the students to demonstrate independence and originality in thought and application. Students will select topics from the field of computer application and based on a thorough review of literature on that topic, they will identify the problems and decide on plans of research for dissertation. Under the supervision of faculty members, they will execute their plans involving theoretical and/or experimental work. Students will have to prepare proper documentation consisting of SRS, Modeling Techniques, Development Strategies and Implementation and Testing Strategies. Student may use any Design Methodologies such as SSAD, OOAD and UML etc. This is done during Phase 1. Regular reviews will be conducted.

### DISSERTATION – PHASE 2 12 cr

The results obtained in Phase 1 will be analysed to arrive at a conclusion which will lead to some novelty in the field of computer application. Dissertation will be prepared as per the prescribed format/ guidelines and will be presented in the form of regular reviews. The Dissertation work will be evaluated continuously over the span of the semester as per the approved procedure. For the final review, the department may appoint external expert from industry or academics. Also, a technical paper based on the work done has to be submitted and published at a reputed conference which indexes the publications in SCOPUS. The formalities insisted by the department in this regard has to be strictly adhered to.

### TECHNICAL WRITING 0 0 1 P/F


Practice in oral communication: Group Discussion, Interviews, and Technical presentations.

### TEXTBOOKS/ REFERENCES:


### PRINCIPLES OF ECONOMICS AND MANAGEMENT 3 0 0 3

Introduction to Management: Managers and Management - History Module - The Historical Roots of Contemporary Management Practices.


TEXTBOOKS/ REFERENCES:

SOFTWARE PROJECT MANAGEMENT


Case Study: PMBOK - MS Project.

TEXTBOOK/ REFERENCES: