Syllabus for Masters Degree in Computer Management
M.C.M.
Equivalent to MBA (Computer Management) Programme of the University of Pune
[M.C.M. Part I From Academic Year 2013-2014,
M.C.M. Part II From Academic Year 2014-2015]

(I) INTRODUCTION

1. The name of the p**rogramme** shall be Masters' Degree in Computer Management (M.C.M.)

2. The knowledge and skills required to plan, design and build complex application software systems are highly valued in all industry sectors including business, health, education and the services. The basic objective of the Masters' Degree in Computer Management (M.C.M.) is to provide to the country a steady stream of competent young men and women with the necessary knowledge, skills and foundations for acquiring a wide range of rewarding careers into the rapidly expanding world of Information Technology.
In today's Global Economic scenario highly skilled versatile professionals with all-round approach for problem solving is need of the hour. MCM program of Pune University wishes to create such professionals.

3. The Job Opportunities are :
   a. Many graduates begin their careers as junior programmers and, after some experience, are promoted to senior programmers, systems analysts, programmer/analysts, software testers posts. Others seek entrepreneurial roles in the computer world as independent business owners, software authors, consultants, or suppliers of systems and equipment. Career opportunities exist in such areas as management, software and hardware sales, technical writing, training others on computers, consulting, software development and technical support.
   b. Application areas include transaction processing (such as order processing, airline, railway reservations, banking systems), accounting functions, sales analysis, games, forecasting, simulation, database management, decision support data communications, and e-commerce.

4. a. The first two semesters of the programme is a mix of computer-related and general business courses. The computer-related courses use computers to introduce standard techniques of programming; the use of software packages systems analysis and design. The general business courses include the functional areas of management like the study of marketing management, financial management, operations management and general management. The course would emphasize the study and creation of business applications, rather than mere programming. Considering the current environment, fundamental concepts related to web-based applications are introduced. Inclusion of Mobile Technologies, Web technologies gives new platforms to students to work on.

b. In semesters III and IV, students are exposed to system development in the information processing environment, with special emphasis on Management Information Systems and Computer Resource Management. Specializations are included in IIIrd Semester which includes network Technology, Software Testing or Software Development. Inclusion of specialization papers will improve thorough knowledge of students in that subject. It will also focus on particular technology in which student is more interested.

c. Colleges are given the opportunity to select Latest technology and prepare students in that Technology with the help of Departmental Subject. In addition Global Industry approved certifications could be offered as supplementary skill upgrade .

d. Soft skills techniques are covered in every semester, which will lead to overall personality development of the student and that will help them in their placement activities and to sustain in the organization successfully. Colleges are encouraged to teach minimum one foreign language in addition to English to enhance employability of students.

5. **Duration:** The M.C.M. program will be full-time two years Masters Degree in Computer Management.

6. The new curriculum would focus on imparting skills, necessary for developing a career in the field of business applications of computer, in emerging global scenario which emphasizes e-business in all sectors of the economy.

7. The institute should organize placement program for the MCM students, by interacting with the industries and software consultancy houses in and around the region in which the educational institution is located.

8. **Intake:** In each class, not more than 60 students will be admitted.

(II) ELIGIBILITY FOR ADMISSION

Graduates possessing any faculty of any statutory University shall be eligible for admission to the M.C.M. course.

(III) NUMBER OF LECTURES AND PRACTICALS :

Lectures and practical should be conducted as per the scheme of lectures and practicals.

(IV) PRACTICAL TRAINING AND PROJECT WORK:

Towards the end of the second year of study, a student will be examined in the course "Project Work".

a. Project Work may be done individually or in groups in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.

b. Student should take guidance from an internal guide and prepare a Project report on "Project Work" in 2 copies to be submitted to the Director of the

Institute by 31st March. Wherever possible, a separate file containing source-code listings should also be submitted.

c. The Project Work should be of such a nature that it could prove useful or be relevant from the commercial / management angle.

d. The project report will be duly assessed by the Internal guide of the subject and marks will be communicated by the Director to the University after receiving the Seat numbers from the University along with marks of the internal credit for theory and practical to be communicated for all other courses.

e. The project report should be prepared in a format prescribed by the University which also specifies the contents and the method of presentation.

f. The project work will carry 250 marks for internal assessment and 250 marks for external viva. The external viva shall be conducted by a minimum of two external examiners.

g. Project Work can be carried out in the Institute or outside with prior permission of the Institute.

h. The external viva-voce examination for Project Work would be held in March/April of the second year of study, by a panel of two external examiners.

(IV) ASSESSMENT

In total 100 credits represent the workload of MCM program.

Total credits=100,

1 credit = 15 lecture Hrs

100 Marks SUBJETCT= 4 CREDITS

Semester	Credit Points
I	24
II	24
III	24
IV	28
Total	100

(V) EXAMINATION

Examinations shall be conducted at the end of each semester i.e. during April/May and also in October/November.

(VI) STANDARD OF PASSING

1. Every candidate must secure atleast Grade D in Concurrent Evaluation as well as University Examination as separate heads of passing for each course. Internal as well as external examination will be held in November and May.

Conversion of Marks to Grade Points & Grades: The marks shall be converted to grade points and grades using Table I below.

Table I: Points Grading System

Sr. No.	Marks	Grade	Grade Point
1	100 – 75	O – Outstanding	06
2	74 – 65	A – Very Good	05
3	64 -55	B – Good	04
4	54 – 50	C – Average	03
5	49 – 45	D – Satisfactory	02
6	44 – 40	E – Pass	01
7	39 – 0	F – Fail	00

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(VII) BACKLOG

Two semesters backlog can be carried to the third semester.

(VIII) Class:

The performance of a student will be evaluated in terms of two indices, viz.

a) *Semester Grade Point Average (SGPA)* which is the Grade Point Average for a semester
b) *Cumulative Grade Point Average (CGPA)* which is the Grade Point Average for all the completed semesters at any point in time.

Semester Grade Point Average (SGPA): At the end of each semester, SGPA is calculated as the weighted average of GPI of all courses in the current semester in which the student has passed, the weights being the credit values of respective courses.

SGPA = Grade Points divided by the summation of Credits of all Courses.

$$SGPA = \frac{\sum \{C * GPI\}}{\sum C} \text{ for a semester.}$$

Where GPI is the Grade and C is credit for the respective Course.

Cumulative Grade Point Average (CGPA): Cumulative Grade Point Average (CGPA) is the grade point average for all completed semesters. CGPA is calculated as the weighted average of all GPI of all courses in which the student has passed up to the current semester.

Cumulative Grade Point Average (CGPA) for the Entire Course

$$SGPA = \frac{\sum \{C * GPI\}}{\sum C} \text{ for all semesters taken together.}$$

Where GPI is the Grade and C is credit for the respective Course.

IMPORTANT NOTE:

If a student secures F grade in either or both of Concurrent Evaluation or University Evaluation for a particular course his /her credits earned for that course shall be ZERO.

Award ofGrade Cards: The University of Pune under its seal shall issue to the learners a grade card on completion of each semester. The final Grade Card issued at the end of the final semester shall contain the details of all courses taken during the entire programme for obtaining the degree.

Final Grades: After calculating the SGPA for an individual semester and the CGPA for entire programme, the value shall be matched with the grade in the Grade Points & Descriptors Table as per the Points Grading System and expressed as a single designated GRADE (as per Table II) such as O, A, B, etc….

Table II: Grade Points & Descriptors

Sr. No.	Marks	Grade	Grade Point
1	100 – 75	O – Outstanding	06
2	74 – 65	A – Very Good	05
3	64 -55	B – Good	04
4	54 – 50	C – Average	03
5	49 – 45	D – Satisfactory	02
6	44 – 40	E – Pass	01
7	39 – 0	F – Fail	00

The description of the final grades shall be as follows:

O: Outstanding (Excellent Analysis of the topic - 75% and above)

Accurate knowledge of the primary material, wide range of reading, logical development of ideas, originality in approaching the subject. Neat and systematic organization of content, elegant and lucid style.

A: Very Good (Excellent Analysis of the topic - 65 to 74 %)

Accurate knowledge of the primary material, acquaintance with seminal publications, logical development of ideas. Neat and systematic organization of content, effective and clear expression.

B : Good (Good Analysis and treatment of the topic - 55 to 64 %)

Basic knowledge of the primary material, logical development of ideas. Neat and systematic organization of content, effective and clear expression.

C : Average (Some important points covered – 50 to 54%)

Basic knowledge of the primary material, logical development of ideas. Neat and systematic organization of content, good language or clear expression.

D: Satisfactory (Some points discussed – 45 to 49%)

Basic knowledge of the primary material, some organization of content, acceptable language or expression.

E: Pass (Any two of the above – 40 to 44%)

F: Fail (None of the above – 0 to 39%)

A student who secures grade E or above in a course is said to have completed /earned the credits assigned to the course. A student who completed the minimum credits required for the MCA programme shall be declared to have completed the programme.

NOTE:
The Grade Card for the final semester shall indicate the following, amongst other details:
a) Grades for concurrent and university evaluation, separately, for all courses offered by the student during the entire programme along with the grade for the total score.
b) SGPA for each semester.
c) CGPA for final semester.
d) Total Marks Scored out of Maximum Marks for the entire programme, with break-up of Marks Scored in Concurrent Evaluation and University Evaluation.
e) Marks scored shall not be recorded on the Grade Card for intermediate semesters.
f) The grade card shall also show the 10-point scale and the formula to convert GPI, SGPA, and/or CGPA to percent marks.

(IX) Medium of Instruction:
The medium of Instruction will be English.

(X) Clarification of Syllabus:
It may be necessary to clarify certain points regarding the course. The syllabus Committee should meet at least once in a year to study and clarify any difficulties from the Institutes.

(XI) Revision of Syllabus:
As the computer technology is changing very fast, revision of the syllabus should be considered every 3 years.

(XII) TEACHING AND PRACTICAL SCHEME

In total 100 credits represent the workload of MCM program.

Total credits=100,

1 credit = 15 lecture Hrs

100 Marks SUBJETCT= 4 CREDITS

Semester I

Subject Code	Subject Name	Internal	External	Credit Points
101	Fundamentals of Information Technology	50	50	4
102	C Programming & Data Structure	50	50	4
103	Software Engineering with UML	50	50	4
104	DBMS	50	50	4
105	Soft Skills	25	25	2
106	Practical (C & Case tools)	50	50	4
107	Soft Skills Practical-Word Power ,Business English	25	25	2
	TOTAL	**300**	**300**	**24**

105 , 106 , 107 External evaluation to be carried out by Expert from other college appointed by the director of the Institute

Semester II				
Subject Code	**Subject Name**	**Internal**	**External**	**Credit Points**
201	BA & ERP Tools	50	50	4
202	PPM & OB	50	50	4
203	Advanced RDBMS using Oracle	50	50	4
204	JAVA Programming	50	50	4
205	Technical Help Desk	25	25	2
206	Practical (Java & Oracle)	50	50	4
207	Soft Skills Practical - Group discussion & Interview Techniques	25	25	2
	TOTAL	**300**	**300**	**24**

205 ,206 ,207External evaluation to be carried out by Expert from other college appointed by the director of the Institute

Semester III				
Subject Code	**Subject Name**	**Internal**	**External**	**Credit Points**
301	Information Security & Audit	50	50	4
302	Optional 1	50	50	4
303	Optional 2	50	50	4
304	Optional 3	50	50	4
305	Web Designing & Content MGMT	25	25	2
306	Specialization Practical & Mini Project	50	50	4
307	Soft Skills Practical – Technical Writing	25	25	2
Networking (302NT- 304)				
302NT	Basics of Networking			
303NT	Server & Desktop Technologies			
304NT	System Administration & Server Integration			
ST Software Testing (302ST, 303ST, 304ST)				
302ST	Software Quality Assurance			
303ST	Software Testing Processes & Documentation			
304ST	Software Test Planning and Documentation			

Software Development (302SD, 303SD, 304SD)				
302SD	Program and Design with ASP.NET			
303SD	Mobile Programming using Android			
304SD	Advanced JAVA			
	TOTAL	**300**	**300**	**24**

305,306, 307 External evaluation to be carried out by Expert from other college / Industry appointed by the director of the Institute

Semester IV

Subject Code	Subject Name	Internal	External	Credit Points
401	Current Trends in IT	50	50	4
402	Departmental Paper (Additional Input)	25	25	2
403	Project	250	250	22
	TOTAL	**325**	**325**	**28**

402 External evaluation to be carried out by Expert from other college /Industry appointed by the director of the Institute
403 External evaluation to be carried out by Expert appointed by UoP

Summary			
Semester	**Total Internal Marks**	**Total External Marks**	**Credit Points**
I	300	300	24
II	300	300	24
III	300	300	24
IV	325	325	28
Total	1225	1225	100

Total Marks : 2450
Total Credit points : 100

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
101	**Fundamentals of Information Technology**	**50**	**50**
Objective: To give introduction to computer systems, operating systems, numbering systems, microprocessor, input output devices.			

Sr. No	Chapter Details	Nos. of Sessions	%	Reference Books
1	**Introduction to Computer Systems** Computer definition Characteristics of Computers Computer Generations (First, Second, Third, Fourth, Fifth with example) Types of Computers (Super computer, Mainframe computer, Mini computer, Micro computer) Digital Block Diagram and function of each unit of Block diagram	**3**	**10**	**1,2,3,4**
2	**Input and Output Units of Computer System** 1. Input devices (I : Keyboard, II : Pointing devices - Mouse, Joystick, Touch Screen, Light Pen, Stylus) II : Scanning devices (Optical Scanners, Bar Code readers, MICR, OCR, OMR) IV : Image capturing devices (Digital Camera, Digital video camera) V: Audio input devices-Microphone 2. Output devices (I : Monitors – Cathode ray tube, Flat panel monitor, II : Printers (Ink jet printer, Laser printer, Thermal printer, Dot matrix printer, Plotter, Photo printer) III : Audio output device – Speakers, Head phones)	**4**	**10**	**1,2,3,4**
3	**Storage devices** 1. Storage (I : Types of Memory – Primary and Secondary / RAM and ROM) II (Storage Capacity : Bit, Byte, MB, KB, GB, TB) III : Primary Storages (RAM, ROM, PROM, EPROM, Cache Memory, function of Cache Memory, Virtual Memory) IV : Secondary Storages(Punch Card, Magnetic Tape, Magnetic Disk, Floppy Disc, CD, DVD, Hard Disk, Pen Drive)	**3**	**10**	**1,2,3,4**

4	**Processing device** Process Devices : (I : Microprocessor, II : Specialty processor – Graphics co processor, Parallel processor)	**3**	**9**	**1,3**
5	**Electronic data and coding system** Number Systems (I : Types - Non Positional Number System, Positional Number System (Binary, Octal, Hexadecimal Number Systems),II : Conversion of One Number System to Another, III : Coding systems : BCD, EBCDIC, ASCII, Unicode)	**3**	**12**	**1,3**
6	**Software system** Software : I - Definition, II - Types of Software, III - Operating System : (Definition and Functions, Types of Operating System, Difference between Windows and Open source Operating System, Batch Processing, Spooling, Multiprocessing, Multiprogramming, Time-Sharing, On-Line Processing, Real-Time Processing	**6**	**12**	**1,2,4,5**
7	**Operating Systems** Process Management, CPU Scheduling, Memory Management, File Management	**8**	**15**	**5,6**
8	**Computer Language** I. Computer language : High Level Language, Low Level Language, II.Language Converter: Compiler, Interpreter, Assembler	**2**	**10**	**1,3**
9	**Computer networking** Networking, I : Computer network and its benefits II : Types of networks - LAN, WAN, MAN, Intranet, Internet III : Network Topologies, IV : OSI Model (Seven layers) V : Communication Media	**5**	**12**	**7,8**
10	**Practical Hands on and presentations by students** Practical Approach : Computer Assembly, Handling Boot Setup, Installation of Operating System and Server, Connecting your client to server, User and Workgroup Handling, General Operating system handling and current new topics in IT	**3**		

Books

1. Computer Fundamentals by P.K. Sinha,BPB Pub,4th Ed.
2. Computer Fundamental by Ram B, new Age International Pub, 4th Ed.
3. Computer Fundamental by Oka Milind M
4. Computer Fundamental by Rajaraman,PHI,4th Ed.
5. Operating System by Galvin,TMH,8th Ed.
6. Operating System by Achyut Godbole,TMH, 2nd Ed.
7. Computer Networks by Andrew S. Tanenbaum,Pearson,4th Ed.
8. Fundamentals of computer networks by Sudakshina Kundu

Website Links:

1. www.olearyseries.com

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
102	**C Programming & Data Structure**	**50**	**50**
Objective: After completing this subject student will be able to understand and write programs by using C language along with basic concepts of Data Structures.			

Sr . No	**Chapter Details**	**Nos. of Session**	**%**	**Reference Books**
1	**C Fundamentals** A Brief History of C, C is middle-level Language, C is a Structured Language, C Character Set, Identifiers and Keywords under ANSI C. Data Types, Constants: int, float, double, char. Qualifiers: long, short, unsigned and signed. Escape sequences (like\n,\b etc.). Arithmetic Expressions and different built-in Operators. Pre-processor directives (like #include, #define), concept of header files, Symbolic constants, Comments, sizeof, steps involved in translation of C Program. Concept of typedef for renaming a built-in data type.	**3**	**8**	**1,2,3,4**
	Flow Charts and Decision Table Flow Diagram, Flow Chart symbols and their use, System flowcharts, program	**2**	**5**	**1,2,3**

2	flowcharts, outline flowcharts, detail flowcharts, flowcharts and signs of communications, flow lines, process decisions, connectors, terminals, flowcharts for simple programs-problems.			
3	**Built-in operators and functions**. Console based I/O and related built-in I/O functions: printf(), scanf(), getch(), getchar(),putchar(), gets(), puts().	**2**	**4**	**1,2,3,4**
4	**Decision and Case Control Structure** if statement, if-else construct, use of logical operators and Compound Relational Tests, Nested if statements, The else if construct, the relational operators, the conditional expression (ternary) operator. The Switch Statement with or without break, concept of a case label, goto statement, concept of a goto label, comparison between goto and case labels.	**2**	**5**	**1,2,3,4**
5	**Loop Control Structure** Concept of Loop, loops supported by 'C', concept of top tested and bottom tested loops, the for loop statement, Nested for Loop , for loop variants, the while loop statement, simple and nested while loop, Increment/decrement operators; Use of Break and Continue, the do-while loop, comparison between for, while and do while loops.	**2**	**5**	**1,2,3,4,5**
6	**Storage Classes** Automatic, Register, Static (local and global),External. Scope rules.	**1**	**4**	**1,2,3,4,5**
7	**Arrays** Concept of a collection, types of collections supported by 'C', Array collection and its features, concept of indexing, index variable, index type, positional value of a member of array collection, concept of dimension and size of an array, 'C' syntax for declaration of array, name of the array and its type, Referring individual elements, Entering data into an array, reading data from an array, concept of Array initialization and list of initializers, size option, Bounds checking, the concept of two dimension arrays and related syntax, similarities between dimension and nesting String	**4**	**10**	**1,2,3,4,5,8**
	Functions Concept of a subprogram, the interface of a		**12**	**1,2,3,4,5,8**

8	subprogram, role of a interface, Arguments of a subprogram, kinds of subprograms supported by C, return statement as an interface, local variables, Default Return type and the type void, Passing values between functions through interfaces, Declaration of function type, iterative and recursive subprograms, Recursion, concept of call by value, call by reference, return and their underlying implementation should be explained, similarities and differences between Function & Macros, concept of nested macros and their use, recursion as a special nested call.	**4**		
9	**Pointers** Concept of Pointers, Pointer as an address variable, concept of a pointer data type and its syntax, built-in address operator, Pointers to existing variables of different data types and their uses, use of indirection operator, the name of the array as a pointer variable, Pointers and Arrays, Pointers arithmetic, use of unary operators (++, --), One Dimension Arrays and Pointer, concept of array of pointers and simple use, command line arguments for the main, pointer as a return type of a function.	**4**	**8**	**1,2,3,4,5,8**
10	**Structures** Structure as a homogeneous and heterogeneous collection, possible applications, syntax of declaring structure, Initializing structures, structure variables, accessing structure elements using member operator, Arrays of Structures, and array as member of structure, conceptual difference between array and structure collection, Functions and Structures, nested structures, concept of anonymous structures and their use, Concept of self referential structure, pointer as member of structure and pointer to structure use of member selector operator(->), comparison between indirection (*) operator and member selector operator (->), structure as an argument to function and return type of a function.	**3**	**8**	**1,2,3,4,5,7,8**
11	**Unions** Concept of Union collection, Syntax of declaration and its use, comparison of Array, Structure and Union, array of unions and union as a member of structure, structure as a member of union and array as member of union, concept of memory saving and union, union	**2**	**2**	**1,2,3,4,5,7,8**

	as a generic data type, concept of anonymous union.			
12	**Console based I/O** use of console as a file environment, use of keyboard and VDU as I/O files: Use of stdin, stdout, stdprn and stderr as built-in file pointers for console environment, use of printf(), scanf() as fprintf() and fscanf(), use of fflush().	**2**	**5**	**1,2,3,4,5,7,8**
13	**File based I/O** Concept of a file, text files in 'C', concept of a predefined FILE pointer and its definition as given in header file stdio.h, meanings of different members of the structure representing FILE, Disk I/O Functions: High level file I/O or standard functions- fopen(), putc(), getc(), fclose(), fgets(),fputs(),feof(), simple file based programs showing the working of different members of FILE structure.	**3**	**10**	**1,2,3,4,5,7,8**
14	**Dynamic Memory Allocation and Memory functions** Concept of dynamic environment as run time environment, concept of dynamic memory management, use of built-in dynamic memory management tools of 'C' viz. malloc(), free(), simple programs using malloc ( ) and free()	**2**	**6**	**1,2,3,4,5,7,8**
15	**Bitwise Operator** Concept of modifying the value using bit shifting, built-in bit shift operators left bit shift operator(<<) and right bit shift operator (>>) their uses, limitations of bitwise operators, use of bitwise relational operators.	**2**	**5**	**1,3,4,5,7,8**
16	**Data Structure Concepts** Definition of data structure, Concept of Link list, Stack, Trees and Queue**.**	**2**	**3**	**10,11,12**

Books:

1.Let us C by Yashwant Kanetkar, BPB,10th Edition

2.C Programming by Balgurusamy, Tata Mc-Graw Hill,5th Edition

3.Turbo C/C++ - The Complete Reference by H. Schildt.
4.Programming in C by S. Kochan,CBS
5.Born to code in C by H. Schildt.
6.The Art of C by H. Schildt.
7.C Programming by Kerninghan and Ritchie – PHI pub,2nd Edition.
8.Programming in ANSI C by Agarwal
9.C Programming with Problem Solving by Jacqueline A Jones, Keith Harrow

10 Practical approach to Data Structure = Hanumant Thapa
11.Data Structure using C & C++ - Langsamy \
12. Data Structure Using C by Tanenbaum ,Pearson Pub.

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
103	**Software Engineering with UML**	**50**	**50**
Objective: After completing this subject student will be able to understand the issues involved in implementing SSAD and OOAD concepts. Student will also be able to analyze project requirements and produce a*n* initial design.			

Sr. No	Chapter Details	Nos. of Sessions	%	Reference Books
1	**Overview of Software Development with SSAD** 1.1 Basic System Development Life Cycle with different users and their role in SDLC. 1.2 Different Approaches and Models for System Development. 1.2.1 Waterfall Model 1.2.2 Spiral Model, Prototyping 1.2.3 RAD 1.2.4 Rational Unified Process with Four Major phases:- Inception , Elaboration, Construction, Transition.	**5**	**15**	**1,4,5,6,7, 9,14**
2	**Overview of Software Development with OOAD** 2.1 Object and Classes 2.2 Abstraction and Encapsulation 2.3 Methods and Message 2.4 Interfaces, Inheritance and Polymorphism	**3**	**5**	**7,11,12,14**
3	**Requirement Determination and Specifications** 3.1 Requirement Investigation & Fact Finding Methods. 3.2 Requirements definition, Types of Requirements - Functional and	**5**	**20**	**1,2,4,10**

	Non-Functional, Quality criteria, Fundamental problems in defining Requirements. 3.3 Software requirement Specification (SRS) - Structure and contents of the requirements specification analysis modeling,			
4	**Requirement Analysis and Design (SSAD & OOAD)** 4.1 Decision Analysis Tools : Decision Tables , Decision Trees & Structured English 4.2 Functional Decomposition Diagram (FDD) 4.3 Process modeling through Logical Data Flow Diagrams. CLD,DFD,ERD & Normalized File Layouts.	**12**	**25**	**1,4,5,6,8, 9,10**
5	**UML** 5.1 Use-case Driven Object oriented Analysis - The UML approach, Develop use-case Model & Description of Use case Diagram. 5.2 Activity Diagram 5.3 Sequence diagram and Collaboration Diagram. 5.4 Class Diagram Containment and Composition Aggregation Inheritance, Sub Types and IS-A Hierarchies. Association and Link Relationships 5.5 State Transition Diagram.	**12**	**25**	**7,11,12, 13,14**
6	6.1 Design of output, Design Types Of Output 6.2 User Interface design: Elements of good design, design issues, Features of modern GUI, Menus, Scroll bars, Windows, Buttons, Icons, Panels, Error Messages etc.	**3**	**10**	**1,4,7,8**

Note: 1. System concept, Types and Characteristics of System can be explained in brief just to get idea about what is system and how it works.
2. Methodology must be case study oriented throughout the syllabus.
3. Faculty must design different cases based on SSAD and/or OOAD, which will impart insight knowledge for the preparation towards presentation and project.
4. ER model and Normalization for mapping with table design will be covered in DBMS .

References

1. Software Engineering Pressman, TMH,7th Ed.
2. System Analysis and Design Jalote, Narosa Pub, 3rd Ed
3. Software Engineering Sommerville, Pearson,8th Ed
4. Software Engineering W S Jawadekar, TMH.
5. System Analysis & Design methods Whiten, Bentley, ,TMH,7th Ed.
6. System Analysis & Design Elias Awad, Galgotia Pub,
7. Object Oriented Modelling & Design James Rumbaugh, PHI.
8. Analysis & Design of Information System James Senn, TMH, 2nd Ed.
9. Analysis & Design of Information System V. Rajaraman, ,PHI,3rd Ed.
10. Software Engineering Concepts Richard Fairley, ,TMH.
11. Object Oriented Analysis and Design with Applications by Grady Booch., Benjamin / Cummings , 1994., Pearson,3rd Ed.
12. Object – Oriented Modeling and Design by J Rumbaugh, M Blaha, W .Premerlani, PHI Pub.
13. Object-Oriented Software Engineering by Ivar Jacobson Pearson Education INC,CENGAGE Learning Pub.
14. Object Oriented System Development by Ali Bahrami,TMH Pub.

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
104	**Database Management System**	**50**	**50**
Objective: After completing this subject student will be able to learn detail concepts of DBMS and understand concept of database design as an implementing point of view by using SQL.			

Sr. No	**Chapter Details**	**Nos. of Sessions**	**%**	**Reference books**

1	**Basic concepts** 1.1 Database and Need for DBMS 1.2 Characteristics of DBMS 1.3 Database Users 1.4 3-tier architecture of DBMS (its advantages over 2-tier) 1.5 Views of data-schemas and instances 1.6 Data Independence	**2**	**10 %**	**1, 2**
2.	**Data Models** 2.1**I**ntroduction to various data models – Record based & Object based 2.2 Cardinality Ratio & Relationships 2.3 Representation of entities, attributes, relationship attributes, relationship set 2.4 Generalization, aggregation 2.4 Structure of relational Database and different types of keys	**6**	**15%**	**1,2,3,4**
3.	**Relational Model** 3.1 Codd's rules 3.2 Relational data model & relational algebra 3.2.1Relational model concept 3.2.2Relational model constraints 3.2.3Relational Algebra 3.3 Relational database language Data definition in SQL, Views and Queries in SQL, Specifying constraints and Indexes in SQL, Specifying constraints management systems,	**8**	**20%**	**1,2,3,4,6**
	Oracle / Ingres/ SQL Server / My SQL			
4	**Relational Database design** 4.1 Database Design – ER to Relational 4.2 Functional dependencies 4.3 Normalization Normal forms based on primary keys (1 NF, 2 NF, 3 NF, BCNF, 4 NF, 5 NF) 4.4 Loss less joins and dependency preserving decomposition	**7**	**20%**	**6,7**
5	**Transaction And Concurrency control** 5.1 Concept of transaction, ACID properties 5.2 Serializibility 5.3 States of transaction, 5.4 Concurrency control 5.4.1 Locking techniques 5.4.2 Time stamp based protocols 5.4.3 Granularity of data items 5.5 Deadlock	**6**	**15%**	**5,6,7,8**

6	**Crash Recovery and Backup** 7.1 Failure classifications 7.2 storage structure 7.3 Recovery & Atomicity 7.4 Log base recovery 7.5 Recovery with concurrent transactions 7.6 Failure with loss of Non-Volatile storage 7.8 Database backup & recovery from catastrophic failure 7.9 Remote Backup System	**4**	**10%**	**4,7,8**
7	**Security and privacy** 8.1 Database security issues 8.2 Discretionary access control based on grant & revoking privilege 8.3 Mandatory access control and role based access control for multilevel security 8.4 Encryption & public key infrastructures	**3**	**5%**	**10**
8	**Data Warehousing and Data Mining** Concept, Architecture, Various tools in Data Warehousing, Tools in Data Mining, Applications of Data Warehousing and Data Mining,	**4**	**5%**	**9**
	Difference between Data mining and normal query.			

Books :

1. Introduction To Database Systems By C.J.Date, Pearson.
2. Data Base System Concept by Korth, TMH, 5th Ed.
3. Data Management Systems by Alexis Leon, Mathew Leon
4. Principals of Database Management by James Martin, PHI.
5. Computer Database Organization by James Martin,PHI,3rd Ed.
6. Relational database design for Micro Computers applications by Prentice Hall(Jackson)
7. Introduction to Data Management Systems by Atul Kahate, Pearson Education Pub.
8. Fundamentals of Database Systems by Elmasri, Navathe, Pearson,5th Ed
9. Data Mining: Concepts and systems - Jiawei nan, Micheline Kamber, (MorganKaufmann publishers
10. Database systems : "Design implementation and management"- Rob Coronel, 4th Edition, (Thomson Learning Press)

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
105	**Soft Skills**	**25**	**25**

Objectives:

1. To encourage the all round development of students by focusing on soft skills.
2. To make student aware about the importance, the role and the content of soft skills through instruction, knowledge acquisition, and practice etc.

Chapter	Chapter Details	No. of Sessions	%	Reference Books
1	**Self Development and Assessment** Self-Assessment Self-Awareness, Perception and Attitudes Values and Belief System Personal Goal Setting Career Planning, Self-Esteem, Building of Self-Confidence	**5**	**10**	**Group I**
2	**Stress Management** Introduction, Stress Management Techniques (Games, Yoga, and Music Therapy), Emotional Quotient, Dealing With People, Failure, Issues (difference of opinions), Discrimination on the grounds of Ethnicity, Nationality, Gender, Sexual Orientation, Zero and No Tolerance Zones, Team Work, Creating and Maintaining Impression, Counseling, Motivation.	**5**	**10**	**Group II**
3	**Components of communication, Principles of Communication** Definition, Communication Block Diagram, barriers, listening skills, Verbal Communication Planning, Human as an Information Processor, Preparation, Delivery, Feedback and Assessment of activities like; - Public speaking - Group Discussion - Oral Presentation skills, - Perfect Interview - Listening and observation skills, Body language - Use of Presentation graphics - Use of Presentation aids, Study of communication.	**10**	**30**	**Group III**
4	**Written Communication** Technical Writing-Technical Reports - Project Proposals - Brochures, - Newsletters, o Technical Articles o Technical Manuals o Official/Business Correspondence - Business letters - Memos Progress report, Minutes of meeting, Event reporting, Use of style, Grammar and Vocabulary for effective technical writing, Use of : Tools, Guidelines for technical writing, Publishing.	**10**	**30**	**Group IV**

5	**Morals, Ethics and Etiquettes** Indian Moral System, Business Ethics, Etiquettes in social as well as Office settings, Email etiquettes Telephone and Short Message Service (Mobile SMS) Etiquettes, Engineering ethics and ethics as an IT professional, Civic Sense.	**05**	**10**	**Group V**
6	**Other Skills** Managing time Meditation, Understanding roles of Engineer, and their Responsibility Exposure, to work environment And culture in today's job Places, Improving Personal Memory, Study skills that include Rapid reading, Notes taking, Complex Problem Solving, Creativity, Leadership Skills.	**05**	**10**	**Group VI**

References for students for self-improvement by self-study

Group I :

1. You Can Win - Shiv Khera - Macmillan Books - 2003 Revised Edition
2. 7 Habits of Highly effective people - Stephen Covey, , Pocket Books
3. You Can Heal Your Life – Louise Hay

Group II :

1. Tim Hindle, "Reducing Stress", Essential Manager Series DK Publishing
2. Robert Heller, "Effective Leadership", Essential Manager series DK Publishing

Group III :

1. Business Communication - Asha Kaul, , PHI
2. Business Communication - M. Balasubramanyam
3. Business Communication – K. K. Sinha
4. Business Communication – Dr. Anjali Ghanekar

Group IV :

1. John Collin, "Perfect Presentation", Video Arts MARSHAL
2. Jenny Rogers " Effective Interviews", Video Arts MARSHAL
3. Raman Sharma, " Technical Communications", OXFORD
4. Sharon Gerson, Steven Gerson "Technical writing process and product",
5. Pearson Education Asia, LPE third edition.
6. R. Sharma, K. Mohan, Business correspondence and report writing",
7. TAG McGraw Hill ISBN 0-07-044555-9
8. Video for technical education catalog, National education and Information Films Ltd. Mumbai.
9. Management training and development catalog, National education and Information Films Ltd. Mumbai.
10. XEBEC, "Presentation Book 1,2,3", Tata McGraw-Hill, 2000,ISBN 0-40221-3

Group V:

1. Sheila Cameron, "Business Student Handbook", Pitman Publishing
2. Newstrom Keith Davis," Organizational Behavior", Tata McGraw-Hill, 0-07-460358-2

Group VI:

1. Dr. R. L. Bhatia, " Managing time for competitive edge"
2. Lorayne Lucas "Memory Book"

It is proposed that expert from industry be invited to conduct lectures and workshops to understand the industry soft-skill requirement.

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
106	**C and Case Tools Practical**	**50**	**50**

The practical sessions and assignments would be based on the topics covered in the subject code – 102 and 103

Find Area, Perimeter of Square & Rectangle.
Find max. Among 3 nos.
Check leap year
Factorial of Number
Calculate a^b
Prime Number.
Perfect Number.
Armstrong Number.
Floyd's Triangle
Fibonacci Series
Inter conversion of Decimal, Binary & Hexadecimal no.
LCM & GCD of numbers
Insert & Delete an element at given location in array.
Transpose of matrices
Multiplication of matrices
Display upper & lower diagonal of matrices
Array of Structure e.g. student result, Employee pay slip , Phone bill
Function with no parameter & no return values
Function with parameter & return values
Function with parameter & no return values
Function with call by reference
Recursion function e.g. sum of digit, reverse of digit
String manipulation function e.g. string copy, concatenation, compare, string length, reverse
Pointer Arithmetic
File handling e.g. Read / Write file, copy file, merging file
Random access of file
File handling with command line arguments
Macro expansion
File Inclusion

Note: this is not limited subject teacher can include new assignments based on syllabus.

Semester – I			
Subject Code	**Subject Title**	**Internal**	**External**
107	**Soft Skills Practical-Word Power, Business English**	**25**	**25**
Objective: To improve the vocabulary of English and comfort ability with business English. Use of language lab is also encouraged and lot of hearing practice, reading and understanding exposure should be given to the students.			

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
201	**Business Application and ERP Tools**	**50**	**50**

Objective :
1. The processes and practices in business and their applications are taught in subject. Student will go through Design to Development life cycle typically carried out in an industry. 2. He will gain domain knowledge in various fields and come to know about HR , manufacturing practices. 3. Also the financial aspect of business and management will be taught to student through this subject

Sr. No	Chapter Details	No. of Sessions	%	Reference Books
1	**Manufacturing:** Product Life Cycle Management, BOM processing with product configuration, MPS, Capacity Requirements Planning for Equipment, Manpower and Time, MRP, Production Planning - work order management - EOQ, EBQ. Shop floor control - calculation of labour efficiency, productivity and equipment down - time analysis Material procurement - Indenting, Purchasing, Vendor analysis, supplier's, Bill passing and receipt of material. Stock accounting and control - raw material, work-in-process and Finished goods Job / Product / WIP costing - Standard, FIFO, LIFO, Avg, Wtd. Avg Sub-contracting of work to outside vendors	**10**	**20**	**1,4,9,10**

2	**Sales And Distribution:** Sales Budgeting - Market segments / Customers / Products Customers Enquiry and preparation of Quotation Customer Order processing - from Order acknowledgement to dispatch and invoicing Pending Customer orders - follow up Sales Analysis Network of Sales outlet - Distributed Databases While explaining this application consider an organisation manufacturing multiple products with sales outlets spread across the country	**6**	**10**	**1,2,3,4,5**
3	**Financial Accounting:** Accounting General Ledger Balance Sheet, P&L , Schedules Trial Balance Journals / Day books			
	Ratio / Expense analysis Account Receivable Account Payables	**6**	**15**	**1,4,6,14**
4	**Human Resource:** Employee Database, Recruitment Employee appraisal, Employee training, Leave accounting, Payroll, Salary calculation and reporting Income Tax calculation and reporting, Loan accounting PF and gratuity, Bonus, Ex-gratia, Incentive, Superannuation , Arrears calculation	**6**	**10**	**1,2,3,4,7, 8,** **14**
5	**Enterprise Resource Planning:** Introduction, What Is ERP? Need of ERP. Advantage of ERP, Growth of ERP **ERP Implementation Life Cycle:** Evaluation and selection of ERP package Project planning, Implementation, Team Training and Testing End User Training and Going Live Post Evaluation and Maintenance	**6**	**20**	**1,4,11,12 ,14**
6	**ERP Case Studies** Post Implementation review of ERP packages in manufacturing, Services and Others Organizations. **(Free ERP tools should be downloaded and demonstrated in the class.)**	**6**	**25**	**11,12,13, 14**

Books :

1. MIS by W.S. Jawadekar,TMH,4th Ed.
2. MIS by Jerome Kanter,PHI pub.
3. MIS by Gordon B. Davis,TMH,2nd Ed.
4. MIS by Laudon and Laudon,Pearson Pub,10th Ed.
5. Marketing Management by Philip Kotler,PHI pub,13th Ed.
6. Fundamentals of Financial management by Prasanna Chandra,TMH,7th Ed.
7. Personnel managament by C. B. Mammoria,Himalaya pub,29th Ed.
8. Human Resource and Personnel Management by K Aswathapa,TMH,5th Ed.
9. Production and Operations Management by Mayer
10. Modern Production Management by R V Badi,Oxford,2nd Ed.
11. Enterprise Resource Planning Alexis Leon, TMH,2nd Ed.
12. ERP Ware: ERP Implementation Framework, V.K. Garg &N.K. Venkita Krishnan

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
202	**Principles of Management and Organizational Behavior**	**50**	**50**
Objective: The basic management concepts and use of management principles in the organization will be introduced to student through this elaborative subject.			

Sr. No	Chapter Details	Nos. of Sessions	%	Reference Books
1	**Essence of Management** 1.1 The need, scope 1.2 Meaning and Definition 1.3 The process of Management 1.4 Managerial levels/Hierarchy 1.5 Managerial functions Planning Organizing Staffing Directing Controlling 1.6 Managerial skills Technical Conceptual Human Resource 1.7 Types of managers Functional Specialize Generalize 1.8 Line and staff managers	**4**	**10**	**1,2,3,4,5**
2	**Evolution of Management Thought** 2.1 Historical perspective 2.2 Classical Theories Taylor Fayol 2.3 Behavioral HR Approach Behavioral Science and Approach 2.4 Management Science Approach 2.5 System approach-with reference to management, organization and MIS	**5**	**10**	**1,2,3,4,5**

	2.6 Contingency approach			
3	**Managerial Decision Making** 3.1 Introduction 3.2 Decision making environment Open Systems Closed system Decision making under certainty Decision making under uncertainty Decision making under risk 3.3 Decision Types /models Structured decisions Unstructured decisions Programmable decisions Non programmable Decisions Classical Model Administrative model 3.4 Decision making tools Autocratic Participative Consultative 3.5 Herbert Simon's Model 3.6 Principle of Rationality / Bounded Rationality	**4**	**10**	**1,2,3,4,5**
4	**Organization** 4.1 Introduction -definition 4.2 Need for Organization 4.3 Process of Organizing 4.4 Organizational structure Functional organization Product Organization Territorial Organization	**2**	**5**	**2,3,4,5**
5	**Organizational Behavior** 5.1 Definition / Concepts 5.2 Need /importance/ relevance 5.3 An overview	**2**	**5**	**6,7,8**
6	**Individual Behavior and Self Understanding** 6.1 Ego State 6.2 Transactional Analysis 6.2 Johari Window	**4**	**10**	**6,7,8**
7	**Group and Group Dynamics**	**4**	**10**	**6,7,8,9**
8	**Team Building**	**4**	**10**	
9	**Global Cultural Behavior**	**2**	**05**	
10	**Leadership**	**3**	**8**	
11	**Conflict Management**	**3**	**8**	
12	**Motivation : Concept, Theory X, Y and Z**	**3**	**9**	

Important Note: The topics in Units 3,4,5 and 6 should be covered with the help of at-least one exercise each. All topics in Organizational Behavior should be covered with the help of role plays, case studies, simulation, games etc.

1. Principles and Practices of Management by Koontz & O'Donelle, TMH,7th Ed.
2. Principles & Practices of Management by L.M.Prasad,S. Chand And Sons pub.
3. Management Today Principles and Practices by Burton & Thakur,
4. Management Principles & Functions by Ivancevich & Gibson , Donnelly
5. Organisational Behavior by Stephen Robbins,Pearson,13th Ed.
6. Organisational Behavior by Keith Davis
7. Organisational Behavior by Fred Luthans,TMH,10th Ed.
8. Organisational Behavior by Dr. K. Ashwatthapa,PHI,7th Ed.
9. PPM & OB by Dr. S. Kulkarni

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
203	**ADVANCED RDBMS USING ORACLE**	**50**	**50**
Objectives : This subject will enhance database handling , data manipulation and data processing skills through SQL & PL/SQL, which will help them in developing data centric computer applications.			

Sr. No.	Chapter details	No. of sessions	Weightage %	Reference Books
1	**Queries** Select with all options Operators Arithmetic Comparison Logical (in, between, like, all, %, _, any, exists, is null, and ,or, not, Distinct) Order by clause	**2**		**1,2,3,4,5**
2	**SQL Functions** Date Sys_date , next_day, Add_months, last_day, months_between, Numeric round, trunc, abs, ceil, cos, exp, floor Character initcap, lower, upper, ltrim, rtrim, translate, length, lpad, rpad, replace Conversion to_char, to_date, to_number Miscellaneous Uid, User, nvl, vsize, decode, rownum Group function avg, max, min, sum, count, with Group by and Having Clause Nested functions	**3**	**12.5**	**1,2,3,4,5**

3	**Joins** Simple join Equi join Non equi join Self join Outer join Set operators (Union, union all, intersect, minus)	**4**	**12**	**1,2,3,4,5**
4	**Sub queries and Correlated query**	**2**		**1,2,3,4,5**
5	**DML statements (Insert, Update, Delete with where clause)**	**1**	**7.5**	**1,2,3,4,5**
	TCL (Commit, Rollback, Savepoint)	**1**		**1,2,3,4,5**
	Locks in Oracle	**1**		**1,2,3,4,5**
	DDL Statements	**1**		**1,2,3,4,5**
6	**Data types** Character Char,Varchar/varchar2, Long Number Number (p) - fixed point, Number (p,s) - floating point Date Raw Long raw Introduction to LOB data types (CLOB,BLOB, BFILE)	**1**	**5**	**1,2,3,4,5**
7	**Table** Create, Alter, Drop, Truncate, Rename Constraints (Primary key, Foreign Key, Unique Key, Check, Default, Not Null, On delete, Cascade) Column level and Table level constraints **Oracle Objects** Views, Sequences, Synonyms, Index (Define, Alter and Drop) **Introduction to Oracle Architecture** **Creating Users and assigning privileges**	**7**	**12.5**	**1,2,3,4,5**
8	**PL / SQL** Introduction to PL/SQL Advantages of PL/SQL PL/SQL Character Set Data types -Character, Raw, rowid, boolean, binary, integer, number, Variable, constant PL/SQL blocks Attribute - % type, % rowtype operators function comparison, numeric, character, date control structure sequential - goto Error handling concept of exception pre defined exceptions -no_data_found, cursor_allready_open, dup_val_on_index, storage_error, program_error,zero_divide, invalid_cursor, login_denied, invalid_number, too_many_rows, dbms_output, user_defined exceptions	**5**	**12.5**	**8,9**
9	**Cursor** Explicit & implicit Cursor, Cursor for loop, Parametric cursor, Declaring cursor variables, Constrained and unconstrained cursor variables, Opening a cursor variable from a query, Closing cursor variables, Restrictions using cursor variables	**2**		**8,9**

10	**Composite Data types** Record, Declaration, refer, record assignment Table declaration, table attributes (count, delete, exists, first, last, next, prior)	**1**	**5**	**8,9**

11	**Database Triggers** Types of Triggers Enabling, disabling Predicates- inserting, updating, deleting **Procedures and Functions** Definition, Implementation and Execution **Packages**	**4**	**12**	**8,9**
12	**Creating an Oracle Database** Use DBCA to create a database, to delete a database, to manage templates **Managing the Oracle Instance** Use Enterprise Manager Use SQL*Plus and iSQL*Plus to access the Oracle Database Modify database initialization parameters Describe the stages of database startup Describe the database shutdown options View the database alert log Use dynamic performance views	**2**	**5**	**10,11,12**
13	**Performing Database Backup** Create consistent database backups Back up your database without shutting it down Create incremental backups Automate database backups Backup a control file to trace Monitor flash recovery area **Performing Database Recovery** Recover from loss of a Control file Recover from loss of a Redo log file Recover from loss of a system-critical data file Recover from loss of a non system-critical data file	**2**	**10**	**10,11,12**
14	**Moving Data** Describe the general architecture of Data Pump Use Data Pump export and import to move data between Oracle databases Load data with SQL Loader Use external tables to move data	**1**	**6**	**10,11,12**

Books:

1. SQL - The complete Reference by Groff James & Weinberg Paul.,TMH,2nd Ed.
2. SQL for Professionals by Kishore Swapna & Naik Rajesh,TMH.
3. SQL from the ground up by Pyofinch Mary
4. SQL Unleashed by Ladanyi Hans.
5. Oracle 7 by Ivan Bayross,BPB Pub.

6. Understanding SQL by Gruber Martin,BPB Pub.
7. Teach yourself SQL in 14 days by Morgan Bryan & Perkins Jeff
8. Oracle PL/SQL Programming by Scott Urman
9. Teach yourself PL/SQL in 21 days by Lucus Tom,techmedia,2nd Ed.
10. OCP: Oracle 10g Certification Kit (1Z0-042 and 1Z0-043)
11. Oracle Database 10g OCP Certification All-In-One Exam Guide (Oracle Database 10g Handbook) by Damir Bersinic, John Watson
12. Oracle Database 10g DBA Handbook by Kevin Loney, Bob Bryla, PublisherMcGraw-Hill

Websites:
http://education.oracle.com

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
204	**Java Programming**	**50**	**50**
Objective: To enable the students to understand the core principles of the Java Language and use visual tools to produce well designed, effective applications and applets.			

Sr. No	Chapter Details	Nos. of Sessions	%	Reference Books
1	**Fundamentals of OOP** What is OOP Difference between Procedural and Object oriented programming Basic OOP concept - Object, classes, abstraction, encapsulation, inheritance, polymorphism	**2**	**5**	Teach Yourself Java 2 in 24 Hours By Rogers Cadenhead http://www.roseindia.net/
2	**Introduction to JAVA** History of Java Features of Java JDK Environment Java Virtual Machine Java Runtime environment	**1**	**3**	Programming with java, A Primer by E. Balguruswamy,TMH,4th ed. http://www.roseindia.net/
3	**Programming Concepts of Basic Java** Data Types in Java Java coding Conventions Expressions in Java Control structures, decision making statements Arrays and its methods	**2**	**5**	Just Java by Peter Van der Liden http://www.roseindia.net/

4	**Java classes** Define class with instance variables and methods Object creation of class Accessing member of class Argument passing Constructors Method overloading Static members	**4**	**10**	OOP with Java An ultimate Tutorial by Jaffry A Borror, http://www.free-ed.net/free-ed/infotech/informit/itlc07.asp
	this keyword Inner classes Wrapper Classes Garbage collection			
5	**Inheritance** Super class & subclass Access Modifiers Abstract method and classes method overriding final keyword super keyword down casting and up casting dynamic method dispatch	**4**	**10**	Programming with java, A Primer by E. Balguruswamy,TMH,4th Ed. http://www.roseindia.net/
6	**Packages and Interfaces** Importing classes User defined packages Implementing interfaces User defined interfaces Adapter classes	**3**	**10**	Java: The Complete Reference Patrick **by** Naughton, Herbert Schildt,TMH,7th Ed.
7	**Exception handling** Types of Exceptions try, catch, finally, throw, throws keywords creating your own exception nested try blocks multiple catch statements exception and inheritance user defined exceptions	**4**	**7**	Java 6 Programming Black Book By Kogent Solution Inc, dreamTech Pub. java.sun.com
8	**Multithreading** Multithreading Concept Thread Life Cycle Thread Priorities Thread synchronization Thread scheduler	**3**	**10**	Programming with java by E. Balguruswamy,TMH,4th Ed.
9	**Abstract Window Toolkit** Components and Graphics Layout managers Border ,Grid ,Flow ,Box ,Card, Gird Bag, Containers, Frames and Panels Event Delegation Model Anonymous Classes	**4**	**5**	Java: The Complete Reference Patrick **by** Naughton, Herbert Schildt, TMH,7th Ed.
10	**Swing**	**5**	**12**	Core Swing: Advanced

	Features of swing Swing components JButton,JRadioButton,JtextArea,JComboBox,JTable,JProgressBar,JSlider,JDialog			Programming By Kim Topley
11	**Applets** Applet life cycle Creating applet Inter applet communication Parameters to applet Event handling in applet	**4**	**10**	Programming with java by E. Balguruswamy,TMH,4th Ed.
12	**Java Utility Packages** Hash table , Vector, Math, Enumeration, Iterator, System, Random, String, StringBuffer	**1**	**4**	Java: The Complete Reference Patrick **by** Naughton, Herbert Schildt,TMH,7th ed.
13	**Streams and File** File class tests and utilities Stream classes InputStream , FileInputStream ,ObjectInputStream OutputStream,FileOutputStream,ObjectOutputStream,DataOutputStream Reader and Writer classes Reader, BufferedReader , InputStreamReader, FileReader, Writer, BufferedWriter, FileWriter, PrintWriter, Serialization and de serialization	**3**	**9**	Java Programming Cookbook By Schildt, TMH,7th Ed.

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
205	**TECHNICAL HELP DESK**	**25**	**25**

Objective : Candidates can expect to gain knowledge and understanding in the following upon successful completion of the education

- Service Management as a practice (Comprehension)
- Service Lifecycle (Comprehension)
- Key Principles and Models (Comprehension)
- Generic Concepts (Awareness)
- Selected Processes (Awareness)
- Selected Roles (Awareness)
- Selected Functions (Awareness)
- Technology and Architecture (Awareness)
- ITIL Qualification scheme (Awareness).

Sr. No	Chapter Details	Nos. of Sessions	%	Reference Books
1.	Service Strategy Describe basics of Value Creation through Services	**2**	**7**	**1 to 7**
2.	Service Design 04-3. Understand the importance of People, Processes, Products and Partners for Service Management 04-4. Discuss the five major aspects of Service Design: Service Portfolio Design Identification of Business Requirements, definition of Service Requirements and design of Services Technology and architectural design Process design Measurement design	**4**	**12**	**1 to 7**
3.	Continual Service Improvement 04-8. Discuss the Plan, Do, Check and Act (PDCA) Model to control and manage quality 04-9. Explain the Continual Service Improvement Model 04-10. Understand the role of measurement for Continual Service Improvement and explain the following key elements: The role of KPIs in the Improvement Process Baselines Types of metrics (technology metrics, process metrics, service metrics) Processes	**2**	**12**	**2,3**
	The purpose of this unit is to help the candidate understand how the Service Management processes contribute to the Service Lifecycle, to explain the high level objectives, scope, basic concepts, activities and challenges for five of the core processes and to state the objectives and some of the basic concepts for thirteen of the remaining processes including how they relate to each other. The list of activities to be included from each process is the minimum required and should not be taken as an exhaustive list.			
4.	Service Strategy 05-1. State the objectives and basic concepts for: • Demand Management Challenges in managing demand for services Activity-based Demand Management (Patterns of business activity (PBAs)) Business activity patterns and user profiles (User profiles) • Financial Management Business Case	**4**	**10**	**2,3,4**

5.	Service Design Explain the high level objectives, scope, basic concepts, process activities, key metrics (KPI's), roles and challenges for: Service Level Management (SLM) Service-based SLA Multi-level SLAs Service level requirements (SLRs) SLAM chart Service review Service improvement plan (SIP) . State the objectives, basic concepts and roles for: • Service Catalogue Management • Availability Management Service availability Component availability Reliability Maintainability Serviceability • Information Security Management (ISM) Security framework Information security policy Information security management system (ISMS) • Supplier Management Supplier Contract Database (SCD)	**6**	**12**	**1**
	Capacity Management Capacity plan Business capacity management Service capacity management Component capacity management IT Service Continuity Management Business Continuity Plans Business Continuity Management Business Impact Analysis Risk Analysis			

6.	Service Transition Explain the high level objectives, scope, basic concepts, process activities, key metrics, roles and challenges for: Change Management Types of change request Change process models and workflows (big table) Standard change Remediation Planning Change Advisory Board / Emergency Change Advisory Board Service Asset and Configuration Management (SACM) The Configuration Model Configuration items Configuration Management System (CMS) Definitive Media Library Configuration baseline 05-6. State the objectives and basic concepts for: 05-61 Release and Deployment Management 05-62 Knowledge Management DIKW & SKMS	**6**	**12%**	**1**
7.	Service Operation 05-7. Explain the high level objectives, scope, basic concepts, process activities, metrics, roles and challenges for: Incident Management Problem Management 05-8. State the objectives, basic concepts and roles for: • Event Management • Request Fulfillment • Access Management	**8**	**10**	**1 to 71 to 7**
8	Functions The purpose of this unit is to help the candidate to explain the role, objectives, organizational structures, staffing and metrics of the Service Desk function and to state the role,	**4**	**10**	**1 to 7**
	objectives and overlap of three other functions. Specifically, candidates must be able to: 06-1. Explain the role, objectives, organizational structures, staffing and metrics of: • The Service Desk function 06-2. State the role, objectives and organizational overlap of: • The Technical Management function • The Application Management function • The IT Operations Management function (IT Operations Control and Facilities Management)			

9	Roles The purpose of this unit is to help the candidate to account for the role and to be aware of the responsibilities of some of the key roles in Service Management. Specifically, candidates must be able to: 07-1. Account for the role and the responsibilities of the • Process owner • Service owner 07-2. Recognize the RACI model and explain its role in determining organizational struct	**2**	**5**	**1 to 7**
10	Technology and Architecture The purpose of this unit is to help the candidate to: 08-2. Understand how Service Automation assists with integrating Service Management processes	**2**	**10**	**1 to 7**

Referencebooks:

1. Service Strategy :ITIL Service Strategy defines the strategic management approach to IT service management (ITSM).
2. ITILV3FoundationHandbook
3. PocketbookfromtheOfficialPublisherofITIL-Packof10
4. Read itSMF's *An Introductory Overview of ITIL® V3*. Free
5. Van Haren: PassingtheITILFoundationExam:2011Edition
6. ArtofServicebook-and-trainingforITIL2011seemstosellalotonAmazon
7. *ITIL Lifecycle Suite 2011 Edition*.

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
206	**Practical (Java & Oracle)**	**50**	**50**
Objective : To get assignments solved based on Java and Advanced RDBMS using Oracle			

Semester – II			
Subject Code	**Subject Title**	**Internal**	**External**
207	**Soft Skills Practical - Group Discussion**	**25**	**25**

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
301	**INFORMATION SECURITY AND AUDIT**	**50**	**50**
Objective: To create awareness about the values of Information and how the Information security practices are meticulously implemented in IT companies worldwide.			

Sr.No	Chapter Details	Nos. of Sessions	%	Reference Books
1	Global information systems and their evolution, basics of information systems, role of the Internet and the World Wide Web	**5**	**10**	1,10
2	Understanding about the threats to information systems security Building blocks of InfoSec, How Organizations manage security of their information systems	**5**	**10**	1,10
3	Information security risk analysis fundamentals Importance of physical security and biometrics controls for protecting information systems assets	**4**	**10**	1,10
4	Security considerations for the mobile work force	**2**	**5**	1,10
5	Network security perspectives, networking and digital communications (overview only), security of wireless networks.	**4**	**10**	1,10
6	Cryptographic techniques and Encryption, Intrusion Detection Systems and Firewalls, security of virtual private networks	**3**	**8**	1,10
7	Security issues in application development with emphasis on integration of enterprise applications, database security, operating security and security of electronic mailing systems	**3**	**8**	1,10
8	Security models and frameworks and standards through introduction to the ISO 27001, SSE-CMM (systems security engineering - capability maturity model), COBIT (Control Objectives for Information and related technologies) and the Sarbanes-Oxley Act (SOX) and SAS 70 (statement on auditing standards)	**5**	**15**	1,4,10
9	Privacy Fundamentals, business practices' impact on data privacy, technological impact on data privacy, privacy issues in web services and applications based on web services	**3**	**8**	3,10

10	Information security best practices - staffing, audits, disaster recovery planning and business continuity planning and asset Management	**3**	**8**	5,10
11	Ethical issues and intellectual property concerns for information security professionals - copy right, data protection etc. matters	**3**	**8**	6,10

Reference Books:

1. Information security policies, procedures and standards by Thomas Pettier.
2. Information security Management Hand book- 5th Edition-HAROLD F. TIPTON
3. Computer security by Alfred Basta, Wolf Halton
4. Information security policies- Thomas R.Peltier, Peltier R. Peltier
5. Electronic Signature law by L Padmavathi
6. Network Security by Ankit Fadia
7. Security Plus study guide by Michael Cross, Norrris Johnson
8. Information systems control and Audit by Ron Weber, Pearson Pub.
9. IS control journals from ISACA
10. Information Systems Security: Security Management, Metrics, Frameworks And Best Practices (With Cd) : Nina Gobole
11. Information Security policies made easy version 10: Charles Cresson Wood

Reference websites:

12. www.searchsecurity.techtarget.com
13. www.secure-byte.com
14. www.security-internal-audit.com
15. www.ngssecure.com/services
16. www.pcisecuritystandards.org

Semester – III

Subject Code	Subject Title	Internal	External
302NT	**Basics of Network Technologies**	**50**	**50**

Objectives :
Students will able to learn networking concepts with practical as well as theoretical concepts after studying this subject

SR. No.	Chapter details	No. of sessions	%	Reference Books
1	**Basic Theory** Types of Networks Peer-Peer Networks Client/Server Networks Host Terminal Network Wireless Network Wi-Fi Network Virtual Private Network Internet Intranet	**2**	**7.5**	**1,2,3**

2	**Protocols** Network Protocols TCP/IP (IP4 & IP6) SPX/IPX NETBEUI Tunneling Protocols PPTP, L2TP,IP,SEC Application Protocols FTP,TELNET,HTTP,HTTPS Mail Protocols SMTP,POP,IMAP Frame Formats & Standards Ethernet 802.2,802.3 Wireless 802.11a,802.11g	**6**	**15**	**1,2,4**
3	**Network Components** Connectivity Components Connectors RG45, Cables CAT 5, CAT 5E, CAT 6 Ethernet Cards, HUBS, Switches, Routers Modems Dial-up Modem , ISDN Modem DSL(Cable) Modem Using Ethernet Card for Accessing Internet	**4**	**10**	**1,2,4**
4	**Topologies (Bus, Star, Ring and Wireless loop)**	**1**		**1,2,3**
5	**Microsoft Network Technology** **a. Features of Microsoft Windows Server 2003** Server Roles File and print server Web server and Mail server Web application services Terminal server Remote access and virtual private network(VPN) server Directory services, Domain Name system(DNS), Dynamic Host Configuration Protocol(DHCP) server, and Windows Internet Naming Service(WINS) **b. Services** Clustering Services Network load Balancing Security Common Language Runtime Internet Information Services(IIS 6.0) File and Print Services Active Directory Microsoft Software Update Services Storage Management Terminal Service Enterprise UDDI service Windows Media Services Microsoft .NET Framework Automated Deployment Service Windows Rights Management Service(RMS) Windows SharePoint Service	**17**	**35**	**5,6**

	c. Features of various types of Servers Standard Server Enteprise Server Data Center Server Web Server Small Business Server **d. Installation** Installing 2003 Server Server Application Installation Installing and Configuring terminal Server Remote Installation Services Implementing Active Directory and domain Implementing Group Policy Implementing Web services using IS Implementing Remote Access Services RADIUS Server Implementing Windows 2003 VPN Configuring Printer Configuring Backup Adding users to groups Configuring Firewall Configuring DHCP Server Building small office and home network using WIN XP and WIN 2000 Installing .NET Frame on Clients			
6	**LINUX Network Technology** **a. Concepts** Linux File System and structure Default directories Network services http,https,ftp,nfs,BOOTTP,DHCP **b. Basic commands** User Management File Management Process Management Printer and Device Management Network Management Package Management **c. Installation** Installing Linux server from CDs Installation Types Installation Class Preparing Partitions Selecting Packages Creating Book Disk Installing from Network Installation Server Selecting Installation source Configuring x-windows Configuring apache web server Configuring DCHP server Configuring firewalls Installing and configuring packages Preparing Remote book thin client for Linux(pxes) (for Linux RedHat Fedora 3 is to be used)	**10**	**32.5**	**7,8**

Books:

1. Introduction to Networking Richard McMohan Tata McGraw Hill Publication
2. Computer Network Fundamentals and application - R S Rajesh Vikas Publication
3. Computer Networks by J S Katre

4. The complete Reference – Networking by Craig Zacker, TMH.
5. Unleashed Windows 2003 Server - Todd Brown & Chris Miller Techmedia, SAMS Publication
6. Microsoft Windows 2000 Professional - Paul Cassel Techmedia SAMS Publication
7. The complete reference – Linux (6th Edition),TMH,6th Ed.
8. Fedora 3 Bible - Christopher Negus Wiley Publication

Websites:
www.microsoft.com/windowsserver2003/
www.technet.microsoft.com/hi-in/windowsserver/bb429524(en-us).aspx
www.redhat.com
www.wikipedia.org
Other References: Help section of windows server 2003

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
303NT	**Server & Desktop Technologies**	**50**	**50**
Objective: We aim to introduce the hardware components and their internal architecture. It also aims at teaching students about how to assemble a PC or Server machine and carryout basic trouble shooting. It also gives and insight about the contemporary desktop OS like Windows xp and Windows 7 and their installation and administration.			

Sr. No	Chapter Details	No of Sessions	%	Reference Books
1	**Introduction to Computers Hardware** RAMS-SDRAM,DDR1,DDR2, etc BIOS Mother boards SMPS Graphic adapter cards Ethernet cards USB, Serial and parallel ports Rack and Tower Servers	**6**	**10**	**5**
2	**Booting problems and their rectification**	**4**	**10**	**3**
3	**CPU Organization** CPU Building Blocks CPU Registers and BUS Characteristics Registers & System Bus Characteristics. Interface Basics (Only Block Diagram) + Local Bus features & Types should be covered. Addressing Modes Interrupts: Concepts and types Instruction and Execution Interrupt cycle Hardwired and Micro Program control RISC and CISC Pipelining – Data Path, Time Space Diagram, Hazards. Instruction + Arithmetic Pipelining + RISC Pipelining	**7**	**15**	**2,3,4**

4	**Processor Architecture** Components of Microprocessor, I/O Ports 16-Bit (80286) Architecture 32-Bit (80486) Architecture Super scalar Architecture in Pentium Processors 64-Bit (Pentium Dual-Core) Architecture	**6**	**15**	**6**
5	**Introduction to Windows XP** Installing Windows XP Professional Edn. User management Disk management-Basic and dynamic disks, Disk backup and restore Recovery Console Repairing windows xp Partition types Hardware and driver installation Software installation TCP/IP based network installation Installting autoupdates and Service packs Security policies User profile management: Roaming and mandatory	**6**	**15**	**1**
6	**Introduction to Windows 7 operating System** Upgrading from windows xp to Windows 7 Windows 7 clean install Partition types Hardware and driver installation Network installation Configuring wi-fi and Bluetooth	**5**	**15**	**7**
7	**Introduction to Printers** Types of printers Parts to printers Installing and troubleshooting printers	**2**	**10**	**5**
8	Drives – HDD,FDD,CD,DVD, Removable drives, Pen Drives, Wireless devices, Fault finding devices Other software's – Antivirus, Diagnostic tools, Data Recovery tools	**4**	**10**	**5**

Reference books:

1. MCSA/MCSE Self-Paced Training Kit (Exam 70-270): Installing, Configuring, and Administering Microsoft® Windows® XP Professional
2. Intel Micro Processors Barry Brey Pearson's Pub,6th ed.
3. Computer Organization & Architecture Carpinell, Pearson pub.
4. An Introduction to Intel Family of Processors -James Antonolcos, Pearson Pub.

Websites:

1. www.intel.com 2. en.wikipedia.org 3. www.pcguide.com 4. www.netlib.org

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
304NT	**System Administration & Server Integration**	**50**	**50**
Objective: To enlighten students about the various server operating systems and its administration			

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Sr. No	Chapter Details	No. of Sessions	%	Reference Books
1.	**Introduction** Distributed Operating System Difference Between Distributed & Centralized OS Advantages of Distributed OS Types of Distributed OS NOS Architecture	**2**	**5**	**1,2,3**
2.	**Introduction to different Server Roles:** DHCP, DNS, Application Server, File and printer Server, WINS, VPN	**2**	**5**	**5,6,8**
3.	**Windows 2003 Server** Installation of Windows 2003	**2**	**10**	**5,8**
4.	Windows 2003 Active Directory Installation of Active directory, Concept of Domains, Structure of Active Directory, Group policies, User Group management, User Management	**4**	**20**	**5,8**
5.	Windows 2003 Server Roles Installation of DNS Server Installation of DHCP Server Installation of Terminal Server Installation of VPN server Installation of IIS Server (including Web Services) Configuring Windows Firewall Configuring WSUS Backup Management Installing .NET Frame on Clients	**10**	**15**	**5,8**
6.	Windows 2008 Server Features and functionality of Active Directory Domain Services. Manage users and service accounts.	**8**	**10**	**9,10**

	Manage groups. Manage computer accounts. Implement a Group Policy infrastructure. Secure administration. Configure Domain Name System. Administer AD DS domain controllers. Manage sites and Active Directory Replication.			
6.	Introduction to Fedora Linux Introduction to Linux, partition types, Directory structure of Linux, Boot loaders, File Types Architecture of Linux (Kernel and Shell),	**4**	**10**	**4**
7.	Installation of Fedora Core OS Boot media types, Installation of Fedora (GUI and text based)	**2**	**10**	**4**
8.	Linux Server services DHCP server installation DNS server installation Samba server installation Group management User management File management Firewall installation Package management (yum, rpm, etc) Network configuration Apache server installation: default web site and virtual hosting x-windows system(including Gnome and KDE)	**6**	**15**	**4**

NOTE: Preferable to use Fedora Core 4 and above for practical of Linux

Reference Books :

1. Operating System: Achyut Godbole, TMH,2nd Ed.
2. Operating System: Galvin, Wiley,8th Ed
3. System Programming & OS: D.M. Dhamdhere, TMH,2nd Ed.
4. The Complete Reference: Red Hat Enterprise Linux & Fedora Edition by Richard L. Petersen and Ibrahim Haddad ,Wiley Pub.
5. MCSE 4-in-1 study system - dreamtech
6. Introduction to Networking Rechard McMohan Tata McGraw Hill Publication
7. Computer Network Fundamentals and application - R S Rajesh Vikas Publication
8. Unleashed Windows 2003 Server - Todd Brown & Chris Miller Techmedia SAMS Publication
9. Microsoft Windows 2008 - BPB publication
10. Microsoft Windows Server 2008 Administration in Simple Steps- Steve Seguis - Dreamtech Publication

Websites : www.microsoft.com/server/2003/
http://fedoraproject.org/

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
302ST	**Software Quality Assurance**	**50**	**50**
Objective : To enable student to learn Software Quality Assurance good practices with the help of various techniques, Strategies and tools.			

Sr.No	Name of topic	**No of sessions**	**%**	**Reference books**
1	**Software project Management** 1.1 Software projects 1.2 Project Life Cycle and stakeholders 1.3 Scope management, Time management, Risk Management	**8**	**20**	**2,3,5**
2	**Software quality** 2.1 Definition 2.2 Software errors, software faults and software failures 2.3 Software quality assurance – definition and objectives 2.4 Software quality assurance vs. software quality control 2.5 The objectives of SQA activities	**4**	**15**	**1,2,3,4**
3	**Pre-project SQA Components** 3.1 Contract Review 3.2 Development and Quality Plan	**4**	**10**	**1**
4	**SQA components in Project life cycle activities assessment.** 4.1 Verification and Validation 4.2 Various types of Reviews 4.3 Inspections 4.4 Walkthrough 4.5 Software testing 4.6 Impact of CASE Tools	**4**	**10**	**1**
5	**SQA Infrastructure Components** 5.1 Procedures 5.2 Templates and Checklists 5.3 Staff training 5.4 Corrective and preventive actions 5.5 Documentation control and procedure manuals	**6**	**12**	**1**

6	**Software Quality Factors** 6.1 Mccall's Quality Model 6.2 Product, Process quality metrics	**3**	**8**	**1,2,3,4**
7	**Standardization** 7.1 ISO 9001 and ISO 9000-3 7.2 SEI-CMM, 7.3 IEEE 1012 standard 7.4 ISO/IEC 12207 standard.	**7**	**15**	**1,2,3,4**
8	**Configuration Management** 8.1 Change control 8.2 Release and version control 8.3 Software configuration management audit	**4**	**10**	**2,3**

Reference books

1. Software Quality Assurance from theory to implementation – Danial Galin
2. Software Project management - Edwin Bennatan
3. Software Engineering Roger S. Pressman,TMH,7Th Ed.
4. Software Quality Assurance : Principles and Practices Nina Godbole,
5. Project Management Body of Knowledge – PMI
6. www.softwarecertifications.org

Semester – III

Subject Code	Subject Title	Internal	External
303ST	**Software Testing Processes and Documentation**	**50**	**50**

Objective :
To enable student to learn Software Testing processes with the help of various software testing techniques, Strategies, tools and technologies

Sr.No	Chapter Details	No of sessions	%	Reference books
1	**Software Testing Principle** Defects – Process defects, design defects, data defects Reducing the frequency of defects in software development Factors affecting software testing Testing constraints Life cycle testing Tester's workbench	**6**	**15**	**1,3,4,5**

2.	**Levels of testing** Verification and Validation Functional and structural testing Static and dynamic testing V Concept of testing with testing stages	**4**	**12**	**1,2,3**
3	**Testing Process and Techniques** Software testing process Structural testing techniques Functional testing techniques White box and black box testing Incremental testing Thread testing Requirement tracing	**10**	**25**	**1,2,3,4,5**
4	**Building Test Environment** Managements support Test work processes Test Tools	**06**	**15**	**1,5**
5	**Testing software developed by contractor** Challenges in testing acquitted software COTS Software Test Process Contracted software test process	**04**	**8**	**1,4,5**
6	**1 Testing Software Controls** Principles and concepts of Internal controls Internal control models Testing of internal controls	**04**	**10**	**1,4,5**
7	**Testing Security Controls** Building a Penetration Point Matrix Creation of security awareness policy, strategy Technique to test security	**02**	**5**	**1,4,5**
8	**Testing new Technologies** Testing Web Based , distributed Applications Testing Wireless Technologies 8.3 Testing e-Commerce application	**04**	**10**	**1,4,5**

Reference Books

1 CSTE Common Body of Knowledge (www.softwarecertifications.org)
2 Software Engineering , R. Pressmen,TMH,7th Ed.
3 Software Engineering, Sommerville,Pearson,8th Ed.
4 Introducing Software Testing Louise Tamres
5 Effective Methods for software Testing William Perry
6 Software Testing in Real World Edward Kit
7. Software Testing Techniques, Boris Beizer, dreamTech pub,2nd Ed.

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
304ST	**Software Test Planning and Documentation**	**50**	**50**
Objective : Explain test plan formats, risk management in testing, defect management and test report generation tools, case studies.			

So	Name of topic	No of sessions	%	Reference books
1	Pre requisites of Test Planning Risk associated with software development Risk associated with software testing Risk Analysis Risk Management	**5**	**12**	**1,2,3**
2	Preparation of Test Plan 2.1 Test Objectives, acceptance criteria 2.2 Assumptions 2.3 Constraints 2.4Characteristics of software being developed 2.5 Develop test Matrix 2.6 Define Test Administration 2.7 Test Plan standards	**8**	**22**	**1,4,5,6**
3	Test Case Design 3.1 Functional test cases 3.2 Structural test cases 3.3 Erroneous test cases 3.4 Stress test cases 3.5 Test Script 3.6 Use Cases	**7**	**20**	**1,2,3,4**
4	Perform tests and recording 4.1 Use of tools in testing 4.2 perform Unit test 4.3 Perform Integration test 4.4 Perform System Test	**5**	**10**	**1**
5	Defect Management	**3**	**8**	**,5,6**
6	Tools used to prepare test report	**4**	**12**	**1,4,5,6,7**

	6.1 Pareto Charts and voting 6.2 Cause and Effect Diagrams 6.3 Check sheet 6.4 Histogram 6.5 Run charts, control charts 6.6 Scatter Plot diagram 6.7 Regression analysis and Multivariate analysis 6.8 benchmarking and QFD			
7	Test Result Reporting Current status test reports Final Test reports	**4**	**8**	**1,4,5,6,7**
8	User Acceptance Testing 8.1 User's Role and tester's role 8.2 Acceptance test plan and execution	**3**	**5**	**1,2,3,4,5**
9	Introduction to TMM	**1**	**3**	**1**

Reference Books

1.CSTE Common Body of Knowledge (www.softwarecertifications.org)

2. Software Engineering , 6th Edition R. Pressmen, ,TMH,7th Ed

3. Software Engineering Sommerville. 8th Ed.

4. Introducing Software Testing Louise Tamres

5. Effective Methods for software Testing William Perry

6. Software Testing in Real World Edward Kit

7. Software Testing Techniques Boris Beizer

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
302SD	**ASP.NET using C#**	**50**	**50**
Objectives : To understand the DOTNET framework, C# language features and Web development using ASP.NET			

Sr. No.	Chapter Details	No. of Sessions	%	Reference Books
1	**Introduction to C#** a. Language features i. Variables and Expressions, type conversion ii. Flow Control iii. Functions, Delegates iv. Debugging and error handling, exception handling (System Defined and User Defined) b. Object Oriented Concepts i. Defining classes, class members, Interfaces, properties ii.Access modifiers, Implementation of class, interface and properties iii. Concept of hiding base class methods, Overriding iv. Event Handling c. Collections, Comparisons and Conversions i. Defining and using collections, Indexers, iterators ii. Type comparison, Value Comparison iii. Overloading Conversion operators, as operator	**6**	**10**	**1,3,4,9**
2	**ASP.NET 3.5** .NET Framework , Types of Websites , Webpage Syntax, Solution Files, Intrinsic Objects in ASP.net	**2**	**8**	**3,5,10,12**
3	**Web Forms: Standard Controls(i)** Web Control Class Buttons, Text Boxes Labels Literals, Place Holders, Hidden Field Control, File Upload Control	**2**	**7**	**3,5,10,12**
4	**Web Forms: - Standard Controls(ii)** Image Controls, Image Buttons, Image Maps, List Boxes, Dropdown, Lists Bulleted Lists, Hyper Links Link Buttons Check Boxes Check Box Lists Radio Buttons ,Radio Button Lists , Tables Panels, View Multiview, Calender	**3**	**6**	**3,5,10,12**
5	**Navigation Controls:-** Tree View Control Menu Control SiteMapPath Control Wizard Control	**2**	**2.5**	**3,10,12**
6	**Validation Controls:-** Required Field Validators, Comparison Validators, Range Validators , Regular Expression Validators, Custom Validators Validation Summaries Validation Groups	**2**	**6**	**3,5,10,12**
7	**ADO.NET (Working with Database)** nnections , Executenonquery, Executescalar ,Executereader , DataAdapter,Dataset , GridView, DataList DetailsView FormView, Repeater SqlDataSource, AccessDataSource, ObjectDataSource XmlDataSource, SiteMapDataSource	**6**	**18**	**4,5,7,11,12**
8	**LINQ** LINQ Queries, Standard Query operators, LINQ to ADO.NET, Lambda Expressions	**2**	**6**	**4,5,7,11,12**

9	**Login Controls:** Login Control, Login View Control, LoginStatus Control, Login Name Control, Password Recovery Control, CreateUserWizard Control, ChangePassword Control	**2**	**6**	**4,5,7,11,12**
10	**Master Pages & Themes** Simple Master Page Nested Master Page Configuring Master Page Creating Themes Applying Themes, Applying Stylesheet	**2**	**5**	**4,5,7,11,12**
11	**ASP.NET Web Services** Creating Web Service, Declaring WebService, Setting the WebService Attribute Deploying the Web Service Simple Object Access Protocol	**3**	**5**	**10,11,12**
12	**ASP.NET AJAX** AJAX Server Controls, Creating AJAX Application, AJAX Control Toolkit	**2**	**5**	**5,10,11,12**
13	**Exception Handling**	**1**	**2.5**	**5,10,11,12**
14	**Crystal Reports** Creating Crystal Reports	**2**	**5**	**5,10,11,12**
15	**XML** Creating XML , Documents Read and Write XML Repeater	**1**	**2.5**	**5,7,10,12**
16	**WPF,WCF & WWF** Introduction, XAML Browser Application, Working with WPF	**1**	**2,5**	**5,7,10,12**
	Controls, Introduction to WCF Introduction to WWF			
17	**Deployment** Deploy Windows Application, Deploying Website, Publishing Website	**1**	**3**	**5,7,10,12**

Recommended Text and Reference books:

1. Beginning Visual C#, Wrox Publication
2. Professional Visual C#, Wrox Publication
3. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â© 2001, 403 pages
4. Beginning ASP.NET 3.5, Wrox Publication
5. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly
6. Illustrated C# 2008, Solis, Publication APRESS, ISBN 978-81-8128-958-2
7. Professional C# 4.0 and .NET 4by Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson,
8. Morgan Skinner, WROX
9. Beginning C# Object-Oriented Programming By Dan Clark , Apress Pub
10. ADO.NET Examples and Best Practices for C# Programmers, By Peter D. Blackburn Apress Pub.
11. Database Programming with C#, By Carsten Thomsen, Apress Pub.
12. Mastering ASP.Net - BPB Publication

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
303SD	**Mobile Programming using Android**	**50**	**50**
Objective : This course introduces mobile application development for the Android platform. Students will learn skills for creating and deploying Android applications, with particular emphasis on software engineering topics including software architecture, software process, usability, and deployment.			

Sr.No.	Name of The Chapter	Nos. of Session	%	References
1	**Introduction to Android** A little Background about mobile technologies Android – An Open Platform for Mobile development Android SDK Features Android versions and features	**6**	**15**	**1,2,5**
2	**Tools for Development** Installing Android First Android application Running on Emulator Android development Tools Eclipse, IDEs and Tools	**2**	**5**	**1,3,4,7**
3	**Android Architecture and OOPS** Building Blocks of Android Java Classes and Objects Class Methods and Instances Inheritance and Polymorphism in Java Interface and Abstract class	**4**	**10**	**1,3,6**
4	**Android UI and Advance Java** Fundamental Android UI Design Introducing Views In Creating new Views Introducing Layouts Creating new Views Using resources Complex UI components Building UI for performance Using themes Debugging Android Code	**8**	**20**	**1,6,7**

5	**Android Graphics and Multimedia** Basic Graphics Input Handling Playing Audio & Video Recording Audio and Video Adding new media to media store Raw Audio Manipulation	**6**	**15**	**1,3,7**
6	**Database and Content Providers** Introducing Android Databases Introducing SQLite on Android SQLiteOpenHelper and creating a database Opening and closing a database Working with cursors Inserts, updates, and deletes Creating new content Provider Using Content providers Native Android Content provider	**8**	**20**	**1,3,5,7**
7	**Services, Broadcast Receivers, Preferences** Overview of services in Android Implementing a Service Service lifecycle Bound versus unbound services Broadcast Receiver Life Cycle Introduction to Preference Types of Preference	**6**	**15**	**1,6,7**
8	**Live Project**			

References:

1. **Professional Android 2 Application Development Paperback** Author, Reto Meier, Wrox Publications

2. **Hello, Android** by Ed Burnette,SPD,3rd Ed.

3. **Professional Android Application Development** by Reto Meier, Wiley India Pub.

4. http://developer.android.com

5. **Android In Action** By W. Frank Ableson,dreamTech Pub.

6. **ANDROID DEVELOPMENT FOR DUMMIES** by Android guru Donn Felker

7. **Programming Android** by Zigurd Mednieks, G. Blake Meike, Laird Dornin and Masumi Nakamura

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
304SD	**Advanced Java**	**50**	**50**
Objective : student will be able to do socket programming, develop server side applications with database handling using servlets and JDBC, structs framework.			

Sr.No	Chapter Details	Nos. of Sessions	%	Reference Books
1	**Networking** Networking basics, Socket, port, Proxy servers, Internet addressing and URL, java.net -networking classes and interfaces, Implementing TCP/IP based Server and Client. Classes to be covered Socket, ServerSocket, IPAddress, URL connections; Programs on chatting 1-1 & 1-M (Threading)	**5**	**15**	Java All-In-One Desk Reference For Dummies By Doug Lowe Java 2 Programing Little Black Book By Alain Trottier
2	**Introduction of JDBC** Types of JDBC Drivers, Writing JDBC applications using select, insert, delete, update; Types of Statement objects (Statement, PreparedStatement and CallableStatement); ResultSet, ResultsetMetaData; Inserting and updating records, Connection Pooling.	**5**	**15**	Java Programming With Oracle Jdbc By Donald Bales Jdbc, Servlets, And Jsp Black Book, New Edition
3	**Introduction of RMI** Architecture (No programming is expected	**1**	**5**	http://www.roseindia.net/ Java and network programming By Krishmurty
4	**Introduction to Java Bean** Rules for writing a Simple Bean	**1**	**5**	Enterprise Java Beans By By Valesky

5	**Java Naming Directory Interface** concept JNDI Architecture,	**1**	**5**	Java Server Programming Java Ee5 Black Book, Platinum Ed By Kogent Solutions Inc
6	**Introduction of Servlet** Student should know how to configure TOMCAT; directory structure for a web Application; Servlet API Overview; Writing and running Simple Servlet. Servlet Life Cycle, GenericServlet and HttpServlet, ServletConfig & ServletContext; Writing servlet to Handle Get and Post Methods, Reading user request data; Writing thread safe servlets, Http Tunneling, Concept of cookie, Reading and writing cookies; Need of Session Management. Types of Session management; Using HttpSession Object ; Servlet & JDBC	**10**	**20**	Developing Java Servlets James Goodwill. Techmedia Inside Servlets – Dustin R. Callway-Pearson Education O'Reilly Book on Servlet and JSP
7	**JSP (Java Server Pages)** Why JSP? JSP Directives, writing simple JSP page; Scripting Elements; JSP Actions: JSP & Java Beans; JSP Actions: include, forward and plugin, Managing sessions using JSP; JSP & Databases; Error Handling in JSP; Writing custom tags; **JSTL -** c, x, frmt, sql, fn, Expression Language, Implicit objects - (request, response, pageContext, session, application), Comments; Java Beans and JSP; Different scopes in a JSP page; Using JDBC in JSP; Study and Development of a Web Application and an Assignment. Tags c:out, c:set, c:if, c:catch, c:choose, c:when, c:otherwise, c:redirect, c:forEach, fmt:parseDate, fn:escapeXml, sql:query, sql:update	**10**	**20**	JSP Professional Wrox Press Java Server Programming Volume I and II Wrox Press O'Reilly Book on Servlet and JSP Jdbc, Servlets, And Jsp Black Book, New Edition

8	**Introduction to Struts** (A Web Application Framework) - struts-config.xml; Understanding MVC architecture; ActionServlet, Action Form, Action Mapping, Action classes	**3**	**5**	Java Server Programming Black Book: 2007 Platinum Ed By Kogent Solutions Inc
9	**Introduction of eclipse** Overview Of eclipse Sample Program execution using eclipse	**2**	**5**	www.ibm.com Eclipse 2 For Java Developers By Berthold Daum
10	**Introduction of hibernate** Overview Of hibernate Hibernate Architecture Understanding Hibernate <generator> element Understanding Hibernate O/R Mapping	**2**	**5**	Professional Hibernate By Eric Pugh, Joseph D. Gradecki

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
305	**Web Designing & Content MGMT**	**25**	**25**
Objective:			

Sr.No	**Chapter Details**	**Nos. of Session**	**%**
1	**Introduction to WWW, Web publishing, Web Hosting**	**1**	
2	**HTML** tags, lists, tables, Links: text, image links Frames, using images in web pages, image mapping , Form Introduction with form elements, DHTML	**3**	
3	Introduction to java script. Operators, identifiers, control structures, functions arrays and error handling.	4	

4	**PHP PROGRAMMING** **Introduction** HTML/XHTML and HTTP Basics Review PHP and the Web Server Architecture Model Overview of PHP Capabilities CGI vs. Shared Object Model PHP HTML Embedding â€“ Tags and Syntax Simple PHP Script Example PHP and HTTP Environment Variables	12	
5	**PHP Language Core** Variables, Constants and Data Types, and Operators Decision Making, Flow Control and Loops Arrays and Array Operations, Two-Dimensional and Multidimensional Arrays, Strings and String Operations Functions, Function Declaration and Parameter Passing Outputting Data â€¢ Include and Require Statements		
	File and Directory Access Operations Error Handling and Reporting Considerations Processing HTML Form Input from the User Creating a Dynamic HTML Form with PHP Login and Authenticating Users Using GET, POST, SESSION, and COOKIE variables Session Management and Variables Working with Cookies, Sending Email Object-oriented PHP: Classes and Constructors		

6	**Database Operations with PHP** Built-in Database Functions, Connecting to a MySQL Database Selecting a Database, Building and Sending the Query to Database Engine, Retrieving Results â€¢ Retrieving, Updating and Inserting Data Sample Database Routines and Code Segments, Logging Database Operations for Troubleshooting	**3**	
7	**Joomala**	**2**	

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
306	**Specialization Practical And Mini project**	**50**	**50**
Objective:			

Semester – III			
Subject Code	**Subject Title**	**Internal**	**External**
307	**Soft Skills Practical – Technical Writing**	**25**	**25**
Objective:			

Semester – IV			
Subject Code	**Subject Title**	**Internal**	**External**
401	**Current Trends in IT**	**50**	**50**
Objective : To make students aware with the changes in technologies, applications and systems around us.			

Sr. No	**Topic Details**	**Nos. of Session**	**%**	**Reference Books**
1	**Social Networking:** Definition, Overview of Social Networking Sites, **Types of Social Networking Sites:** General purpose, Niche Advantages of Social Networking Sites, Drawbacks of Social Networking Sites, Features And Need of Social Networking, Security Issues with Social Networking Sites, Examples	**8**	**20**	

2	**Cloud Computing:** Definition, Cloud Architecture, Cloud Storage, **Cloud Types:** The NIST Model, The Cloud Cube Model, Deployment Models, Service Models **Cloud Computing Service Models:** 1. Infrastructure as a Service(IaaS) 2.Platform as a Service(PaaS) 3. Software as a Service(SaaS) **Benefits of Cloud Computing** **Disadvantages of Cloud Computing** **Cloud Security**	**8**	**20**	**2,6**
3	**Enterprise Content Management**: ECM Introduction, Definition, Process, Types of Content, Examples **Content Management System(CMS)** Overview and examples, **Electronic Document Management(EDM) :** introduction, Need, Examples	**6**	**20**	**5**
4	**e-Learning**: Definition, Introduction, Types of e-Learning: 1.Learner-led e-Learning 2.facilitated e-Learning 3.Instructor-led e-Learning 4. Embedded e-Learning Telemonitoring And e-Coaching **e-Learning Models**: 1. WBT 2.CBT 3.LMS 4.LCMS 5.Virtual School Systems **e-Learning Tools And Technologies:**E-Mail,Online Discussion, Chat and Instant Messaging,Voting,Whiteboard, Application Sharing,Conferencing, Online Meeting Tools **Standards for e-Learning** **Case Study**	**8**	**20**	**1**

5	**e/m-Commerce:** **e-Commerce** definition, Models of e-Commerce, **Electronic Payment Systems:** Credit/Debit Cards, Smart Cards, Paypal, e-Billing,e-Micropayments Point Of Sales System(POS): Meaning, Uses **m-Commerce:** Overview of mobile-Commerce, Attributes of m-Commerce, Drivers of m-Commerce, m-Commerce Security issues, Mobile ATM(ICICI Bank Case Study) Applications of m-Commerce: 1.Mobile Financial Applications, m-wallet 2.Mobile Shopping 3.Advertising And Content provision **Case-Study**	**10**	**20**	**3,4**

References:

Sr. No.	**Book**	**Author**
1.	E-Learning Tools and Technologies	William Hortan, Katherine Hortan,Wiley Pub.
2.	Cloud Computing Bible	Barrie Sosinsky,Wiley India pub

3. E-Commerce C.S.V. Murthy,Himalaya Pub.
4. E-World (Excel Publications) Arpita Gopal and Chandrani Singh
5. Electronic Commerce A Managerial Perspective Efraim Turban, Pearson Pub.
6. Decision Support Systems and Intelligent Systems Efraim Turban, Jay Aronson, Pearson,7th Ed
7. Cloud computing Michael Miller, Pearson Pub.
8. Internet (Use of Search Engines Google & yahoo etc)

Semester – IV			
Subject Code	**Subject Title**	**Internal**	**External**
402	**Departmental Paper (Additional Input)**	**25**	**25**

Semester – IV			
Subject Code	**Subject Title**	**Internal**	**External**
403	**Project**	**250**	**250**

Semester – IV

Project Evaluation Phases Recommended				
Phase	**Description**	**Internal**	**External**	**TimeLine**
1	SRS Document	40	50	3nd Week
2	Design document	40	100	7th Week
3	Executable/User Interface	40	50	12th Week
4	Test plan and Documentation	40	50	16th Week
5	Project Viva/Presentation	90		20th Week

General Instruction Regarding Preparation of Project Report For MCM-II - SEM-IV

TYPING

1. The typing shall be standard 12 pts in double spaced using black ink only
2. Margins must be Left 2 inches Right 1.5 inches Top 2 inches Bottom 1.5 inches
3. Paper A4 size Bond Paper

COPIES

Two hard-bound copies
(Black Rexine with Golden Embossing as per format displayed herewith)
One original and one clean Xerox Copy.

FORMAT FOR TITLE PAGE AND FOR EMBOSSING

PROJECT REPORT
ON

[NAME OF THE SYSTEM]

[NAME OF THE COMPANY[

BY

[NAME OF STUDENT]

UNIVERSITY OF PUNE

MASTER IN COMPUTER MANAGEMENT

[INSTITUTE Name]

PUNE-4110..

20012-2014

The Guidelines regarding the documentation and scope of project are mentioned here below

MCM-II SEM-IV (COMMERCIAL SYSTEM PROJECTS)

Project Report should be submitted in following format for Commercial Application Projects viz. Payroll, Sales, Purchase, Inventory, Book Shop, Examination system etc. Where VB, Access, Oracle, ASP and Java is used.

2 Blank Pages at beginning Title Page
Certificate from Company
Certificate from Guide
Acknowledgement
Index with printed Page Numbers
CHAPTER 1 : INTRODUCTION
1.1 Company Profile
1.2 Existing System and Need for System
1.3 Scope of Work
1.4 Operating Environment - Hardware and Software

CHAPTER 2 : PROPOSED SYSTEM
2.1 Proposed System
2.2 Objectives of System
2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN
3.1 Data Flow Diagram (DFD)
3.2 Functional Decomposition Diagram (FDD)
3.3 Entity Relationship Diagram (ERD)
3.4 Data Dictionary
3.5 Table Design
3.6 Code Design
3.7 Menu Tree
3.8 Menu Screens
3.9 Input Screens
3.10 Report Formats
3.11 Test Procedures and Implementation

CHAPTER 4 : USER MANUAL
4.1 User Manual
4.2 Operations Manual / Menu Explanation
4.3 Forms and Report Specifications

Drawbacks and Limitations Proposed Enhancements Conclusion Bibliography ANNEXURES:
ANNEXURE 1 : INPUT FORMS WITH DATA

Project report should be submitted in following format for project using OOAD, Embedded System, WAP and other technologies and Web Deployed Systems where C, C++, J2EE, .NET, OOAD and JAVA, SDK's, API's are used.

***** TECHNICAL PROJECTS ********

2 Blank Pages at beginning Title Page
Certificate from Company
Certificate from Guide
Acknowledgement
Index with printed Page Numbers
CHAPTER 1 : INTRODUCTION
1.1 Company Profile
1.2 Existing System and Need for System
1.3 Scope of Work
1.4 Operating Environment - Hardware and Software
1.5 Detail Description of Technology Used

CHAPTER 2 : PROPOSED SYSTEM
2.1 Proposed System
2.2 Objectives of System
2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN
3.1 Object Diagram
3.2 Class Diagram
3.3 Use Case Diagrams
3.4 Module Hierarchy Diagram
3.5 Component Diagram
3.6 Deployment Diagram (in case of Web Deployment)
3.7 Module Specifications
3.8 Interface Diagram (in case of WAP and Embedded Systems)
3.9 Web Site Map Diagram (in case of Web Site)
3.10 User Interface Design (Screens etc.)
3.11 Table specifications (in case back end is a database)
3.12 Test Procedures and Implementation

CHAPTER 4 : USER MANUAL
4.1 User Manual
4.2 Operations Manual / Menu Explanation
4.3 Program Specifications / Flow Charts

Drawbacks and Limitations
Proposed Enhancements
Conclusion
Bibliography ANNEXURES:

ANNEXURE 1 : USER INTERFACE SCREENS
ANNEXURE 2 : OUTPUT REPORTS WITH DATA (if any)
ANNEXURE 3 : SAMPLE PROGRAM CODE (which will prove sufficient development is done by the student)
2 **Blank Pages at the end.**

Internal [50] Marks Breakup	
Unit Test Marks	20
Prelim Marks	10
Assignment/ Write-up/Case study	10
Presentations/ Group Activity	20
Attendance	10
Total Marks	**50**