

Semester 3

IT and E-Learning Skills (ICT151)

Course Objectives:

- To prepare students in understanding ICT basics and make them conversant in using operating systems.
- Remembering, recognizing, and recalling include retrieving relevant knowledge from memory recognition.
- Online testing stimulates self-assessment, self-education and self-knowledge, because of the given feedback.
- Understanding how to use different resources of e-learning like LMS,OERs, MOOC, Mobile , productivity tools etc.

Learning Outcomes:

- Learners must be able to recall or remember the information.
- Learners must be able to understand the information.
- Learners must be able to use the information they have learned at the same or different contexts.
- Learners must be able to analyze the information, by identifying its different components.
- Able to use different resources of e-learning like LMS,OERs, MOOC, Mobile , productivity tools etc.

Unit No. and Name	Details	Counseling Sessions	Weightage
Unit 1: Learning Skills	<ul style="list-style-type: none"> • Observations • reading • writing • thinking • Verbal Communication 	2	5
Unit 2 : 21st century Learning environment	<ul style="list-style-type: none"> • ICT • Flip Classrooms • Virtual laboratories • Blended Learning • Collaborative Learning • LMS • OERs • MOOC • Mobile learning • Machine assessment and feedback • Self and Peer assessment 	4	10
Unit 3: Productivity tools Part I	<ul style="list-style-type: none"> • Wordprocessing • Spreadsheet • Presentation softwares • Utilities 	4	15
Unit 4: Productivity tools Part II	<ul style="list-style-type: none"> • e-mail • Search Engines • Smart Phones 	3	10
Unit 5: ELearning Skills	<ul style="list-style-type: none"> • Searching the right Information on web • Using Social Media effectively • Blogs • Discussion Forums • Ethics and Etiquettes 	5	15

Unit 6: E learning Challenges	<ul style="list-style-type: none"> • Motivation • Evaluating effectiveness • Adaptability • Technical issues • Time Management 	3	10
Unit 7: Security	<ul style="list-style-type: none"> • Threats • Desktop and mobile security • Cyber Security 	3	10
Unit 8: List of resources	<ul style="list-style-type: none"> • MOOC • Open Educational resources • Mobile apps 	2	5
	Revision	4	0
		30	80

Reference Books:

1. Design for How People Learn (recently updated with 3 new chapters)
2. ISD from the Ground Up: A No-Nonsense Approach to Instructional Design
3. Understanding by Design
4. E-Learning Fundamentals: A Practical Guide
5. Michael Allen's books. I recommend starting with one from his E-Learning Library series.

Operating System (CMP507)

Course Objectives

- Gain extensive knowledge on principles and modules of operating systems.
- Understand key mechanisms in design of operating systems modules.
- Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks.
- To understand what a process is and how processes are synchronized and scheduled.
- How to use system calls for managing processes, memory and the file system.
- Understand the data structures and algorithms used to implement an OS.

Learning Outcomes

- Analyze the concepts of processes in operating system and illustration of the scheduling of processor for a given problem instance.
- Identify the dead lock situation and provide appropriate solution so that protection and security of the operating system is also maintained.
- Analyze memory management techniques, concepts of virtual memory and disk scheduling.
- Understand the implementation of file systems and directories along with the interfacing of IO devices with the operating system.
- Ability to apply CPU scheduling algorithms to manage tasks.
- Initiation into the process of applying memory management methods and allocation policies.
- Knowledge of methods of prevention and recovery from a system deadlock.

Unit No. & Name	Details	Counseling Sessions	Weightage
Unit 1 History of The Operating Systems	<ul style="list-style-type: none"> • Introduction(What is OS, Important of OS, Features, Uses, Applications) • Evolution of OS (proprietary, CP/M, DOS, UNIX, Windows and other, Command line to GUI, Portability, Client Server) • Types of Operating System(multiprogramming systems, batch systems , time sharing systems; operating systems for personal computers & workstations, process control & real time systems.) • User's View of the Operating System 	3	10
Unit 2 Operating System –Functions And Structure	<ul style="list-style-type: none"> • Different Services of the Operating Systems <ul style="list-style-type: none"> ○ Information Management ○ Process Management ○ Memory Management • Uses of System Calls • Operating System Structure (Monolithic (Simple) Operating System, Layered Operating System, Microkernel Operating System, Exokernel Operating system), • Virtual Machine • Booting 	3	10
Unit 3 Information Management	<ul style="list-style-type: none"> • Disk Basics • Direct Memory Access (DMA) • File System (Block and Block numbering Scheme, File Support Levels, Writing/Reading a Record, Relationship between the Operating System and DMS, File Directory Entry, Open/Close Operations, Disk Space Allocation Methods, Directory Structure: User's View, Implementation of a Directory System) • Device Driver (DD) (Basics, Path Management, Submodules of DD) 	3	10

Unit4 Process Management	<ul style="list-style-type: none"> • Process, • Evolution of Multiprogramming • Context Switching, • Process States, Process State Transitions, Process Control Block (PCB), Process Hierarchy, Operation on a Process, Create/ Kill/ Dispatch a Process, Change the Priority of a Process, • Block / Time Up /Wake Up a Process, Suspend/ Resume Operations, • Process Scheduling (Objectives, Concepts of Priority and Time Slice, Scheduling philosophies, Scheduling Levels, Scheduling Policies (For Short Term scheduling)), • Multithreading (Models, Implementation of Threads) 	6	10
Unit 5 Inter Process Communication	<ul style="list-style-type: none"> • The Producer-Consumer Problems, Solutions to the Producer-Consumer Problems (Interrupt Disabling/Enabling, Lock-flag, • What are Primitives for Mutual Exclusion? • Classical IPC problems • Semaphores • Alternating Policy • Peterson's Algorithm 		15
Unit 6 I/O Management And Deadlock	<ul style="list-style-type: none"> • I/O Procedure, I/O Scheduler, Device Handler, Interrupt Service Routine (ISR) • Terminal I/O(Terminal Hardware, Terminal Software) • Organizing Data on the CD-ROM, DVD-ROM • Graphical Representation of a Deadlock, • Deadlock Prerequisites • Deadlock Strategies (Ignore a Deadlock, Detect a Deadlock, Recover from a Deadlock, Prevent a Deadlock, Avoid a Deadlock) 	4	10

Unit 7 Memory Management	<ul style="list-style-type: none"> • Single Contiguous Memory Management • Fixed Partitioned Memory Management • Variable Partitions (Allocation Algorithms, Swapping, Relocation and Address Translation, Protection and Sharing, Evaluation) • Non-Contiguous Allocation – General Concepts, Paging (Allocation Algorithms, Swapping, Relocation and Address Translation), Segmentation (Swapping, Address Translation and Relocation, Sharing and Protection) • Combined Systems • Virtual Memory Management Systems (Relocation and Address Translation, Swapping, Relocation and Address Translation, Protection and Sharing, Evaluation, Design Consideration for Virtual Systems) 	6	10
Unit 8 Protection and Security	<ul style="list-style-type: none"> • Protection and Security Policy mechanism • Authentication • Internal access Authorization 	3	5
	Revision	2	0
		30	80

Reference Books:

1. Operating Systems by Achyut Godbole
2. Operating Systems A Concept Based Approach -by Dhananjay dhamdhere
3. Operating System Concepts by Silberschatz, Galvin and Gagne.

Web Technologies (CMP508)

Course Objectives

- To learn advanced features of the web programming.
- To learn various Web Technologies and their characteristics of HTML, XHTML, JavaScript, XML.
- To learn the basic principles of Web programming like designing and implement static and dynamic Web pages.
- To enhance problem solving and programming skills in web programming with extensive programming projects.
- To acquire fundamental skills to maintain web server services required to host a website.
- Understand hierarchy of object oriented programming.

Learning Outcomes

Upon completion of this course, students will be able to:

- Understand the various steps in designing Creative and dynamic website.
- Write HTML, JavaScript, CSS and PHP.
- Ability to develop web pages using HTML and Cascading Style Sheets.
- Skill to create XML documents and Schemas.
- Knowledge of client-side (JavaScript) and server-side scripting (PHP, ASP.NET) languages to build dynamic web pages.
- Familiarization with Web Application Terminologies, Internet Tools, E – Commerce and other web services.
- Ability to develop database applications with MySQL.

Unit No. & Name	Details	Counseling Sessions	Weightage
Unit 1 Introduction to Web	<ul style="list-style-type: none">• History and Evolution• Web development cycle• Web publishing• Web contents• Dynamic Web contents	3	10
Unit 2 Languages and technologies for browsers	<ul style="list-style-type: none">• HTML, DHTML, XHTML, JSP, JavaScript• Features and Applications	3	10

Unit 3 Introduction to HTML	<ul style="list-style-type: none"> • HTML Fundamentals • HTML Browsers • HTML tags, Elements and Attributes • Structure of HTML code: Head, Body • Lists: Ordered List, Unordered List, Definition List, Nesting List • Block Level Tags:Block formatting, Heading, Paragraph, Comments, Text, alignment, Font size • Text Level Tags: Bold, Italic, Underlined, Strikethrough, Subscript, superscript • Inserting graphics: Scaling images, Frameset, Forms • An introduction to DHTML , DOM 	3	10
Unit 4 Cascading Style Sheets	<ul style="list-style-type: none"> • The usefulness of style sheets • Types of Style sheets • Creating style sheets • Common tasks with CSS • Font Family: Font Metrics, Units • Properties • Classes and Pseudo classes • CSS tags 	3	10
Unit 5 Introduction to Client side Scripting	<ul style="list-style-type: none"> • What is Scripting Language • Client side and server side scripting • Types of scripting languages 	2	10
Unit 6 JavaScript	<ul style="list-style-type: none"> • Introduction • Operators, Assignments and Comparisons, Reserved words • Starting with JavaScript: Writing first JavaScript program, Putting Comments 	5	10
	<ul style="list-style-type: none"> • Functions • Statements in JavaScript • Working with objects: Object Types and Object Instantiation, Date object, Math Object, String object, Event object, Frame object, Screen object • Handling Events: Event handling attributes, Window Events, Form Events, Event Object, Event Simulation • Events- Keyboard & Mouse events 		

Unit 7 XML	<ul style="list-style-type: none"> • Introduction to XML, • Anatomy of an XML document • Creating XML Documents, • Creating XML DTDs, XML Schemas, XSL 	3	10
Unit 8 Website Design Concepts	<ul style="list-style-type: none"> • How the website should be: Basic rules of Web Page design, Types of Website 	4	10
	Revision	4	0
		30	80

Reference Books:

1. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, XML and AJAX, Black Book
2. Information Architecture for The World Wide Web” by Morville
3. “A Practical Guide to Developing Web 2.0 Rich Internet Applications” by Phil Pearl
4. **Web Information Systems Engineering – WISE 2016” by Jianmin Wang and Wojciech Cellary**

Database Management System (CMP509)

Course Objectives

- The objective of the course is to enable students to understand and use a relational database system. Introduction to Databases, Conceptual design using ERD, Functional dependencies and Normalization, Relational Algebra is covered in detail.
- To learn how to design a database by using different models.
- Students learn how to design and create a good database and use various SQL operations.
- To enable the students to understand the database handling during execution of the transactions.
- To understand the handling of database by concurrent users.
- To gain complete knowledge of SQL and PL/SQL
- The course concludes with an overview of transaction management and introduction to advanced and non-relational databases.

Learning Outcomes

Upon completion of this course, students will be able to:

- Able to master the basic concepts and understand the applications of database systems.
- Able to construct an Entity-Relationship (E-R) model from specifications and to transform to relational model.
- Able to construct unary/binary/set/aggregate queries in Relational Algebra.
- Understand and apply database normalization principles.
- Able to construct SQL queries to perform CRUD operations on database. (Create, Retrieve, Update, Delete) and Ability to code database transactions using SQL.
- Understand principles of database transaction management, database recovery, security.
- Skill to write PL/SQL programs.

Unit No. & Name	Details	Counseling Sessions	Weightage
Unit 1 Data files and DBMS	<ul style="list-style-type: none"> • Introduction- Data, Files • Operations on file • Introduction to Database -Definition of database, Entity, • Attributes, Domain, Instance, Record/Tuple 	3	10
Unit 2 Introduction to DBMS	<ul style="list-style-type: none"> • Definition to DMBS • WHY DMBS • Services provided by DMBS – Transaction Management, Concurrency Control, Recovery Management, Security Management, Language Interface • Applications of DMBS • Differences between File System and DMBS • Drawbacks of File system • Abstraction Levels (Three Levels of Abstraction) • Database Users • DDL and DML • Structure of DMBS • Metadata 	3	10

Unit 3 Relational data models and relational algebra	<ul style="list-style-type: none"> • Introduction to DATA Models • Object-based Logical Models - E-R Model, Object-Oriented Model • Record-based Logical Models - Relational Model, Network Model, Hierarchical Model • Physical Data Models 		10
Unit 4 Entity Relationship	<ul style="list-style-type: none"> • Overview • Modelling • Basic styles of data model • ER Model • Components of ER Model - Entity, Attributes, Entity Set, Domain • Entity Types – weak entity, Strong Entity, Recursive Entity, Composite Entities • Attributes Types – Simple, Composite, Single Valued, Multi Valued, Stored, Derived, Complex, Null Attributes. • Relation • Relationship – Relationship set, Connectivity in relationship • Types of Relationship – Unary, Binary, Ternary • Classifying Relationship – Degree of 	3	10
	<ul style="list-style-type: none"> Relationship, Multiplicity, Existence • Mapping Cardinalities – One to One, One to Many, Many to One, Many to Many • Keys • Keys for Relationship set- Super key, Candidate key, Secondary key, Compound key, Alternate key, Primary key, Foreign key • E-R Diagrams – E-R Modelling Symbols • Cardinality Constraints related to E-R diagrams • Alternative Notations for cardinality limits • Weak Entity sets • Case Studies on E-R diagrams 		
Unit 5 Normalizations	<ul style="list-style-type: none"> • Overview • Relational DB design • Decomposition (Small schema) • Lossy Decomposition • Loss less Decomposition • Functional Dependency – Full Dependency, Partial Dependency, Transitive Dependency • Normalized Forms – Un – Normalized form, 1NF, 2NF, 3NF • De-normalization 	3	10

Unit 6 SQL	<ul style="list-style-type: none"> • Introduction • SQL Statements - DML, DDL, DCL • Data Types in SQL • Basic Types structure • SELECT- SQL SELECT DISTINCT Statement, SQL Where Clause, And, OR, In, Between, Like Operator, SQL Order by Keyword, Aggregate Functions, Group By, Having Clause. • CREATE – DROP TABLE, Constraints • INSERT, UPDATE, DELETE, ALTER • DATA Control Language (DCL) • Different operations on tables – Rename, Tuple Variables, Set Operations(UNION Operator, UNION ALL Operator, INTERSECT Operator, Minus Operator), String Operations • Null Values 	4	10
Unit 7 Transaction Management	<ul style="list-style-type: none"> • Introduction • Transaction Concept • Properties of Transactions • Transaction Terminology • Transaction Terminology • Transaction States • Concurrent Execution of Transactions • Operations on a Transactions • Concurrency Control • Schedules • Recoverability 	3	10
Unit 8 PL/SQL	<ul style="list-style-type: none"> • Introduction to PL/SQL • The Advantages of PL/SQL • PL/SQL Architecture • PL/SQL Data types • Variable and Constants • Using Built_in Functions • Conditional and Unconditional Statements • Simple if, if... else, nested if..else, if..else Ladder • Selection Case, Simple Case, GOTO Label and EXIT • Iterations in PL/SQL • Procedures in PL/SQL • EXCEPTIONS in PL/SQL • Database Triggers in PL/SQL • File Input/Output 	4	10
	Examples and Revision	4	0

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Reference Books:

- 1) Database System Concepts (4th Ed) By: Korth, Sudarshan, Silberschatz
2. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke, McGraw-Hill
3. Fundamentals of Database Systems (4th Ed) By: Elmasri and Navathe
4. MySQL :the Complete Reference By Vikram Vaswani
5. Learning MySQL by O'reilly

Lab: Operating System (CMP707)

Practical No.	Practical	Activities
1		DOS commands
2		Batch file
3		UNIX Commands
4		File access permissions(Read/ Write/Execute/ chmodcommand)
5		File processing commands(CAT/ join/sort/paste/compare/word count /grep command)
6		File / folder sharing in windows
7		Windows Control panel 1 –
8		Windows Control panel 2
9		Demonstration of Task Manager
10		Demonstration of computer manage tool
11		Numerical on process scheduling
12		Numerical on memory management (Best Fit/ worst fit)
13		Numerical on paging and segmentation
14		Simulation 1
15		Simulation 2
		Case Study : Implementation of Mutual Exclusion Primitives

Lab: Web Technologies (CMP708)

Practical No.	Practical	Activities
1		Design a web page using different text formatting tags.
2		Design a web page with different types of Marquee.
3		Design a web page with links to different pages and allow navigation between pages.
4		Design a web page with Image and Imagemaps.
5		Create a student table with the following fields. Student Id, Name, DOB, Course, Address, E-mail id and apply Embedded cascading style sheet CSS with the following attributes:Font size, color, style, bold, italic, border color, set the background image & set the center align of table & text.
6		Create an external CSS for above and apply to the web page.
		Create a frameset that divides browser window into horizontal and vertical framesets.
8		Write the javascript code to enter five numbers in the prompt box. Calculate addition of the numbers & average.
9		Create a web page with image and text apply javascript Mouse events – onmouseover , onmouseout, onclick on the image and text
10		Create a page which displays Javascript popupboxes : <ol style="list-style-type: none"> 1. Alert 2. Confirm 3. Prompt.
11		Design a form and validate all the controls placed on the form using Java Script.
12		Design a DTD, corresponding XML document and display it in browser using CSS.
13		Design an XML document and display it in browser using XSL
14		Design XML Schema and corresponding XML document
15		Create a web site with Minimum 3 pages Home, Page 1 and Page2 Incorporate all HTML & DHTML elements. The pages should be linked.

Lab: Database Management System (CMP709)

Practical No.	Practical	Activities
1	Entity Relationship Model	<p>AIM: To draw ER Model and Relational Model for a given database</p> <p>a) Case study 1:List the data requirements for the database of the company which keeps track of the company employee, department and projects. The database designers provide the following description</p> <ol style="list-style-type: none"> 1. The company is organized into departments. Each department has unique name, unique number, and particular employee to manage the department. We keep track of the start date and the employee begins managing the department. The department has several locations. 2. The department controls a number of projects each of which has a unique name, unique number and a single location. 3. We store each employee names social security number , address , salary, sex and dob. An employee is assigned one department but may work on several projects which are not necessarily controlled by the same department. We keep track of the department of each employee works on each project and for insurance purpose. We keep each dependents first name, sex, dob and relation. <p>b) Case study 2: Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. Also Construct appropriate tables for the ER Diagram</p>
2	Entity Relationship	<p>AIM: Create one-to-many Relationship between Manager and Employee Relations Create following Relations with the given fields</p> <p>a) EMPLOYEE EmpId (PK), EmpName (Should be in the upper case), Department(Should be Finance, Purchase or Sales) Salary, Mgrid</p> <p>b) MANAGER Mgrid, MgrName, No. of Employees controlled</p> <p>Using above table solve the following queries:</p> <ol style="list-style-type: none"> a. Display details of all those employees whose salary is higher than Rs.50 b. Display the details of employees who are working in Purchase department.

3	Normalization	<p>AIM: Determine the functional dependencies. Remove partial dependency and transitive dependencies in given table. (i.e. convert it into 3NF).</p> <p>Student = (RollNo, Name, Course_Code, Course_Name, Fees)</p> <table border="1" data-bbox="528 371 1246 701"> <thead> <tr> <th>RollNo</th> <th>Name</th> <th>Course_Code</th> <th>CourseName</th> <th>Fees</th> </tr> </thead> <tbody> <tr> <td>123</td> <td>Ravi</td> <td>C102</td> <td>C</td> <td>2500</td> </tr> <tr> <td>123</td> <td>Ravi</td> <td>C103</td> <td>C++</td> <td>1200</td> </tr> <tr> <td>123</td> <td>Ravi</td> <td>C104</td> <td>OOPs</td> <td>3200</td> </tr> <tr> <td>124</td> <td>Sumit</td> <td>C102</td> <td>C</td> <td>2500</td> </tr> <tr> <td>124</td> <td>Sumit</td> <td>C103</td> <td>C++</td> <td>1200</td> </tr> <tr> <td>125</td> <td>Trupta</td> <td>C102</td> <td>C</td> <td>2500</td> </tr> <tr> <td>125</td> <td>Trupta</td> <td>C103</td> <td>C++</td> <td>1200</td> </tr> <tr> <td>125</td> <td>Trupta</td> <td>C104</td> <td>OOPs</td> <td>3200</td> </tr> </tbody> </table>	RollNo	Name	Course_Code	CourseName	Fees	123	Ravi	C102	C	2500	123	Ravi	C103	C++	1200	123	Ravi	C104	OOPs	3200	124	Sumit	C102	C	2500	124	Sumit	C103	C++	1200	125	Trupta	C102	C	2500	125	Trupta	C103	C++	1200	125	Trupta	C104	OOPs	3200
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4	DDL command	<p>AIM: Creation of Database and table-DDL COMMAND Create a table called EMP with the following structure.</p> <table border="1" data-bbox="600 898 1134 1093"> <thead> <tr> <th>Name</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>EMPNO</td> <td>NUMBER(6)</td> </tr> <tr> <td>ENAME</td> <td>VARCHAR2(20)</td> </tr> <tr> <td>JOB</td> <td>VARCHAR2(10)</td> </tr> <tr> <td>DEPTNO</td> <td>NUMBER(3)</td> </tr> <tr> <td>SAL</td> <td>NUMBER(7,2)</td> </tr> </tbody> </table> <p>Allow NULL for all columns except ENAME and JOB.</p> <p>a) -Add a column experience to the emp table. experience numeric null allowed.</p> <p>b) Modify the column width of the job field of emp table.</p> <p>Create dept table with the following structure.</p> <table border="1" data-bbox="600 1384 1134 1512"> <thead> <tr> <th>Name</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>DEPTNO</td> <td>NUMBER(2)</td> </tr> <tr> <td>DNAME</td> <td>VARCHAR2(10)</td> </tr> <tr> <td>LOC</td> <td>VARCHAR2(10)</td> </tr> </tbody> </table> <p>DEPTNO as the primary key</p> <p>a) Create the emp1 table with ename and empno, add constraints to check the empno value while entering (i.e) empno > 100.</p> <p>b) Drop a column experience to the emp table.</p>	Name	Type	EMPNO	NUMBER(6)	ENAME	VARCHAR2(20)	JOB	VARCHAR2(10)	DEPTNO	NUMBER(3)	SAL	NUMBER(7,2)	Name	Type	DEPTNO	NUMBER(2)	DNAME	VARCHAR2(10)	LOC	VARCHAR2(10)																									
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5	DML command	<p>AIM: Simple SQL Query-1-DML COMMAND</p> <p>A] Write syntax of all DML command.</p> <p>B] Create database where create following tables:</p> <p>Emp(EMPNO int, ENAME VARCHAR(20),JOB</p>																																													

		<p>VARCHAR(10),DEPTNO int,SAL numeric(7,2))</p> <p>Allow NULL for all columns except ename and job.</p> <p>Dept(DEPTNO int, DNAME VARCHAR(10),LOC VARCHAR(10))</p> <p>Deptno as the primarykey</p> <p>Insert at least 8 records into tables and solve the following given queries using Emp and Dept table:</p> <ol style="list-style-type: none"> Create the emp1 table with ename and empno, add constraints to check the empno value while entering (i.e) empno> 100. Update the emp table to set the salary of all employees to Rs15000/- who are working as ASP. Delete only those who are working as lecturer. List the records in the emp table orderby salary in ascending order. Display total salary spent for each job category. Add constraints to the emp table that empno as the primary key and deptno as the foreign key. Add columns DOB to the emp table.
6	SQL Functions	<p>AIM: Simple SQL Query2: SQL Functions</p> <ol style="list-style-type: none"> List all the aggregate functions with example? List all the string functions with example? Using above Emptable solve the following queries: <ol style="list-style-type: none"> Display all the details of the records whose employee name starts with 'A'. Display all the details of the records whose employee name does not start with 'A'. Calculate the total and average salary amount of the emp table. Determine the max and min salary and rename the column as max_salary and min_salary. Find how many job titles are available in employee table. Count the total records in the emp table.
7	Set Operations	<p>AIM: Advanced SQL queries using Set Operations.</p> <ol style="list-style-type: none"> List all the set operators? Using above Emp table solve the following queries: <ol style="list-style-type: none"> Display all the dept numbers available with the dept and emp tables avoiding duplicates.

		<ol style="list-style-type: none"> 2. Display all the dept numbers available with the dept and emp tables. 3. Display all the dept numbers available in emp and not in dept tables and vice versa.
8	Sub query	<p>AIM: Advanced SQL queries using Sub query.</p> <p>Using aboveEmp table solve the following queries:</p> <ol style="list-style-type: none"> 1. Display all employee names and salary whose salary is greater than minimum salary of the company and jobtitle starts with 'M'. 2. Issue a query to find all the employees who work in the same job as Arjun. 3. Issue a query to display information about employees who earn more than any employee in dept.
9	JOINS	<p>AIM: Advanced SQL queries using JOINS.</p> <ol style="list-style-type: none"> a) What is joins? List types of joins with syntax b) Using aboveEmp table solve the following queries: <ol style="list-style-type: none"> 1. Display the employee details, departments that the departments are same in both the emp and dept. 2. Display all the employees and the departments implementing a left outer join. 3. Display the employee name and department name in which they are working implementing a right outer join. 4. Display the employee name and department name in which they are working implementing a full outer join.
10	PL-SQL	<p>AIM: Advanced SQL queries using PL-SQL.</p> <p>Solve the following PL-SQL programs.</p> <ol style="list-style-type: none"> A) Write a pl/sql program to swap two numbers. B) Write a pl/sql program to find the largest of two numbers.
11	PROCEDURE AND FUNCTION	<p>AIM: Advanced SQL queries usingPROCEDURE AND FUNCTION A]</p> <p>Write syntax of Procedure and Function.</p> <p>B] Create a procedure to print the odd numbers from 1 to 10.</p>
12	Practice Questions1	<p>AIM: Write a pl/sql program to find the total and average of 6 subjects and display the grade</p>
13	Practice Questions2	<p>AIM: Write a procedure to calculate total for the all the students and pass regno, mark1, & mark2 as arguments.</p>
14	Practice	<p>AIM: Write a procedure raise_sal which increases the salary of an</p>

	Questions3	<p>employee. It accepts an employee number and salary increase amount. It uses the employee number to find the current salary from the EMPLOYEE table and update the salary.</p> <p>Consider the EMPLOYEE (EMPNO, SALARY, ENAME) Table.</p>
15	Practice Questions-SQL Query	<p>AIM: Simple SQL Query.</p> <p>Q.1) Create the following tables with the mapping given below.</p> <p>stu_details(reg_no, stu_name, DOB, address, city) mark_details(reg_no, mark1, mark2, mark3, total)</p> <p>(i) Display only those rows whose total ranges between 250 and 300. (ii) Drop the table mark_details. (iii) Delete the row whose reg_no=161. (iv) Display all details whose names begins with 'a'.</p> <p>Create the following tables with the mapping given below.</p> <p>book (book_name,author,price,quantity). customer (Cust_id , Cust_name, Addr, ph_no,pan_no)</p> <p>(i) Truncate the table customer. (ii) List the author of the book which one have the price of 200. (iii) List the price of the book which one is between the price of 175 & 250. (iv) Retrieve all the details from the table book whose author name start with K.</p>

SEMESTER 4

Financial and Investment Skills (OPN272)

Course Objective:

- To understand theories of value, risk and return, capital investment decisions, financing decisions, dividend policy, capital structure, and options. Also, to study leasing, corporate takeovers, and managerial compensation.
- To advance the understanding of fundamental concepts of finance, financial markets and market participants, valuation techniques of financial instruments, and working knowledge of portfolio management
- To develop critical thinking and problem solving competencies, at both the individual and group levels, of financial statement analysis, financial planning, principles of valuation, capital budgeting, capital structure, and issues in financial policy, and to apply financial theory to analyze real life situations in an uncertain environment with an incomplete data set.
- To gain an understanding of how debt and equity funds are attracted to capitalize investment real estate by utilizing standard investment measures of Internal Rate of Return, Net Present Value and Return on Investment to evaluate prospective real estate investments and formulate investment strategies that will optimize the investor's expected investment outcome.

Learning Outcomes:

- Students will have the knowledge and skills to select and employ base level tools for financial analysis.
- Students will have the knowledge and skills to analyze companies for investment purposes.
- Students will have the knowledge and skills to develop portfolio strategies for individual and institutional investors.
- Students will have the knowledge and to operate ethically as investment management professionals.
- Students will be able to identify and analyze the relevant legal issues involved in civil and criminal matters affecting business.

Unit No. and Name	Details	Counseling Sessions	Weightage
Unit 1 Introduction to Stock Markets-1	<ul style="list-style-type: none">• The Need to Invest• Regulators• Financial Intermediaries• The IPO Markets	2	5
Unit 2 Introduction to Stock Markets-2	<ul style="list-style-type: none">• The Stock Markets• The Stock Markets Index• Commonly Used Jargons• The Trading Terminal	3	5
Unit 3 Introduction to Stock Markets-3	<ul style="list-style-type: none">• Clearing and Settlement Process• Five Corporate Actions and Its Impact on Stock Prices• Key Events and Their Impact on Markets• Getting started!	3	5
Unit 4 Fundamental Analysis-1	<ul style="list-style-type: none">• Introduction to Fundamental Analysis• Mindset of an Investor• How to Read the Annual Report of a Company	3	5

Unit 5 Fundamental Analysis-2	<ul style="list-style-type: none"> • Understanding the P&L Statement • Understanding Balance Sheet Statement • The Cash Flow statement • The Financial Ratio Analysis 	3	10
Unit 6 Fundamental Analysis-3	<ul style="list-style-type: none"> • The Investment Due Diligence • Equity Research • Discounted Cash Flow (DCF) and Time Value of Money • The follies of DCF Analysis • Margin of Safety • When to sell? How many stocks in the portfolio? 	3	10
Unit 7 Technical Analysis - 01	<ul style="list-style-type: none"> • Background, Introducing Technical Analysis • The Chart Types • Getting Started with Candlesticks 	2	5
Unit 8 Technical Analysis - 02	<ul style="list-style-type: none"> • Single Candlestick patterns • Multiple candlestick patterns • The Support and Resistance 	3	10
Unit 9 Technical Analysis - 03	<ul style="list-style-type: none"> • Volumes, Moving Averages • Indicators • The Fibonacci Retracements • The Dow Theory • Getting Started 	3	5
Unit 10 Markets and Taxation	<ul style="list-style-type: none"> • Introduction, Basics • Classifying Your Market Activity • Taxation for Investors • Taxation for Traders • Turnover • Balance Sheet • and P&L • ITR Forms 	3	10
Unit 11 Trading Psychology and Risk Management	<ul style="list-style-type: none"> • Risk • Equity Curve • Expected Returns • Portfolio Optimization • Value at Risk • Position Sizing for Active Trader 	2	10
	•	30	80

References Books:

1. The Business of Investment Banking by K. Thomas Liaw
2. A Dictionary of Finance and Banking, oxford
3. Finance: The Basics Book by Erik Banks

Computer System Architecture (CMP510)

Course Objectives:

- The objective of this course is to study the basics of Computer System and to learn how to configure computer devices.
- To understand the structure, function and characteristics of computer systems.
- To understand the design of the various functional units and components of computers like Motherboard, storage devices, display devices and input output devices.
- To understand the peripheral devices and their applications.
- To understand PC Troubleshooting and Maintenance Tools.
- To understand the concept of Power supply and it's working.
- To understand the concept of parallel processing and pipelining in detail and its applications.

Learning Outcome:

After completion of this course, the student will be able to

- Understand Motherboard & Its Components working.
- Understand Cache memory and its working, role in OS.
- Understand the roles and working of Storage Devices and how the data is stored on these devices.
- Understand how different storage, peripheral and input output devices are connected to computer and their working.
- Understand and demonstrate PC Troubleshooting use of different Maintenance Tools.
- Understand the concept of parallel processing ,pipelining and Programming aspects for Intel Itanium Processor

Unit No. and Name	Details	Counseling Sessions	Weightage
Unit 1: Motherboard & Its Component Objectives	<ul style="list-style-type: none"> • CPU – Concept like address lines, data lines, internal registers. • Modes of operation of CPU – Real mode, IA-32 mode, IA-32 Virtual Real Mode. • Process Technologies, Dual Independent Bus Architecture, Hyper Threading Technologies & its requirement. • Processor socket & slots. • Chipset basic, chipset Architecture, North / South bridge & Hub Architecture. • Latest chipset for PC • Overview & features of PCI, PCI –X, PCI express, AGP bus. • Logical memory organization conventional memory, extended memory, expanded memory. • Overview & features of SDRAM, DDR, DDR2, DDR3. • Concept of Cache memory: • L1 Cache, L2 Cache, L3 Cache, Cache Hit & Cache Miss. 	4	10

	<ul style="list-style-type: none"> • BIOS – Basics & CMOS Set Up. • Motherboard Selection Criteria. 		
Unit 2 : Storage Devices & Interfacing. Objectives	<ul style="list-style-type: none"> • Recording Techniques: FM, MFM , RLL, perpendicular recording • Hard Disk construction and working. • Terms related to Hard Disk. • Track, sector, cylinder, cluster, landing zone, MBR, zone recording, write pre-compensation. • Formatting: Low level, High level & partitioning. • FAT Basics: Introduction to file system, FAT 16, FAT 32, NTFS • Hard Disk Interface: Features of IDE, SCSI, PATA, SATA, Cables and Jumpers. • CD ROM Drive: Construction, recording.(Block diagram) • DVD: Construction, Recording. (Block Diagram) • Blue-ray Disc specification. 	4	1 0
Unit 3: Display Devices & Interfacing	<ul style="list-style-type: none"> • CRT: - Block diagram & working of monochrome & colour Monitor • Characteristics of CRT Monitor :- DOT Pitch, Resolution, Horizontal Scanning frequency, Verticalscanning frequency, Interlaced Scanning, Non-Interfaced scanning, • Aspect ratio. • LCD Monitor: - Functional Block Diagram of LCD monitor, working principle, Passive matrix, Active matrix LCD display. • Touch Screen Display – The construction and working principle • Plasma Display Technology: - Construction & working principle. • Basic Block Diagram of Video Accelerator card 	4	1 0

Unit 4: Input and Output Devices	<ul style="list-style-type: none"> • Keyboard: Types of key switches: Membrane, Mechanical, Rubber dome, Capacitive, optoelectronic and interfacing. • Mouse: Opto-mechanical, optical (New design) • Scanner: Flat Bed, Sheet-fed, Handheld: Block diagram of flat Bed and specifications, OCR, TWAIN, Resolution, Interpolation. • Modem: Internal and External: Block diagram and specifications. • Printer: Printer Characteristics, Dot matrix, Inkjet, Laser: block diagram and specifications 	3	1 0
Unit 5: Power Supplies	<ul style="list-style-type: none"> • Block diagram and working of SMPS. • Signal description and pin-out diagram of AT and ATX connectors • Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation. • Power problems: Blackout, Brownout, surges and spikes. • Symptoms of power problems. • Protection devices: circuit breaker, surge suppressor. • Uninterrupted Power Supply, Online and Offline UPS, working of UPS: Block diagram, advantages and disadvantages, Ratings 	4	1 0
Unit 6: Interfaces	<ul style="list-style-type: none"> • SCSI, SCSI cables and connectors, SCSI drive configuration. • USB features. • RS 232 : (Voltages and 9 pin description) • Centronics (interface diagram, important signals and timing waveform) • Firewire features • Blue tooth 	4	1 0
Unit 7: PC Troubleshooting, Maintenance and Tools	<ul style="list-style-type: none"> • POST: POST sequence, Beep codes, visual display codes. • Preventive maintenance: Active, Passive, periodic maintenance procedure • Diagnostic Tools: logic Analyzer, logic probe. • Diagnostic software for trouble shooting PC • BGA workstation and its applications for reballing of north bridge and south bridge 	3	1 0
Unit 8: Overview of Parallel Processing and Pipelining Processing	<ul style="list-style-type: none"> • Study and comparison of uniprocessors and parallel processors. Conventional and EPIC architecture • Evolution of parallel processors • Future trends and there architecture • Overview of Parallel Processing and Pipelining Processing. Necessity of High Performance • Constraints of conventional architecture • Parallelism in uniprocessor system • Architectural Classification • Applications of parallel Processing • Instruction level Parallelism and Thread Level Parallelism • Explicitly Parallel Instruction Computing (EPIC) 	4	1 0

	Architecture <ul style="list-style-type: none"> • Case Study of Intel Itanium Processor • Principles of scalable performance: Performance Metrics and Measures, Speedup Performance Laws • Programming aspects for Intel Itanium Processor. 		
		3 0	8 0

Reference Books:

1. Computer organization and architecture by william stallings
2. "Computer Organization" by Zvonco Vranesic and Safwat Zaky

Software Engineering (CMP511)

Course Objectives

- To provide foundation for understanding the software development process in a defined way according to industrial standards.
- To understand the complete software development life cycle and the different methodologies.
- To develop an understanding of software engineering, software crisis, SDLC. Understanding the concept of software project planning – feasibility analysis, requirement analysis, SRS documents.
- To know the software designing strategies – structured analysis, structured design, DFD, structure chart.
- Understand concept of Project Management along with software testing, maintenance, back-up..

Learning Outcomes

After completion of this course, the student will be able to

- Develop the software projects or prototypes by understanding the requirements.
- Meet the project deadlines along with the number of resources and type of tasks to be carried out.
- Evaluate and analyze the SDLC and basic architecture SRS documents.
- Help to understand the software design and coding techniques.
- Understand the software testing principles.
- Understand the concept project management.
- Identify various concepts of Advanced UML techniques

Unit No. and Name	Details	Counseling Sessions	Weightage
Unit 1 Software Engineering and Models	<ul style="list-style-type: none"> • Evolution of SE • Software Standards • Importance of SE • Various Models – Waterfall, Spiral , RAD 	3	1 0
Unit 2 Requirement Analysis	<ul style="list-style-type: none"> • SRS • Fact Finding • DFD • ERD • Data Dictionary • Structure Charts 	4	1 0
Unit 3 Software Design	<ul style="list-style-type: none"> • Architectural Design • Modular Design with SC Guidelines – Coupling / Cohesion • Interface Design – Screen Design 	4	1 0
Unit 4 Coding, structured programming, programming practices	<ul style="list-style-type: none"> • Logic • Algorithm Design • Design walk through • Critical Design Review • Coding • Programming Practices • Structured Programming 	3	1 0
Unit 5 Software Testing	<ul style="list-style-type: none"> • Testing Strategies • Testing Architecture • Testing Tools • Maintenance • Defect analysis 	4	1 0
Unit 6 Quality Assurance	<ul style="list-style-type: none"> • Attributes for Quality • Quality Standards • Checklist • SEI/CMMi 	4	1 0

Unit 7 Software Configuration Management	<ul style="list-style-type: none"> • Software Change Management • Software Configuration Management • Change Control 	4	1 0
Unit 8 Latest trends in Software Engineering	<ul style="list-style-type: none"> • Web SE • Case Tools • Project Matrix • UML • XP programming • OOAD • Agile programming 	4	1 0
		3 0	8 0

Reference Books:

1. Software Engineering – A Practitioner’s Approach 7 th Edition – Roger S. Pressman [McGraw Hill International Edition]
2. Software Engineering – IAN Sommerville 7th / 8th Edition (Pearson Edition)

JAVA (CMP512)

Course Objectives

- The fundamental point in learning programming is to develop the critical skills of formulating programmatic solutions for real problems.
- To learn the syntax and semantics to write Java programs.
- To understand the fundamentals of object-oriented programming in Java.
- Learn to develop object oriented software using class encapsulation and inheritance, packages and interfaces
- To impart the basic concepts of Java Programming and to develop understanding about Basic Object oriented Design using UML and Applet.
- Design and implement Applet and event handling mechanisms in programs

Learning Outcome:

Upon completion of this course, students will be able to:

- Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
- Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
- Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling).
- Use testing and debugging tools to automatically discover errors of Java programs as well as use versioning tools for collaborative programming/editing.
- Develop programs using the Java Collection API as well as the Java standard class library.
- Apply object oriented programming concepts in problem solving through JAVA.

Unit No. and Name	Details	Counseling Sessions	Weightage
Unit 1 Evolution of Java; Variables and Naming Rules	Evolution <ul style="list-style-type: none">• History of Java• Features of Java• Difference in the working of C++ and Java• What is JDK, JRE and JVM?• Introduction to Class and objects• Instantiation in java variables and naming rules• Variables in Java• Scopes of the variables• Datatypes• Operators• Primitive Variables• Garbage Collection of the variables.• Source File Declaration Rules• Class and Method Naming Rules• Camel Casing Rule	4	10

Unit 2 Decision Making and looping	<ul style="list-style-type: none"> • if statement • if-else statement • if – else if – else ladder • nesting of if • ? : operator • switch case • for loop • while loop • Do while loop • Jumps in Loops 	4	1 0
Unit 3 Implementation of Methods	<ul style="list-style-type: none"> • Methods and Constructor • Method Overloading and Constructor Overloading • Method Overriding • Static members • Final keyword • Inheritance • Super keyword 	4	1 0
Unit 4 Wrapper Classes, Arrays & String	<p>Wrapper Classes</p> <ul style="list-style-type: none"> • Data Types in Java • Wrapper Classes • Conversion and Utility methods of Wrapper Class • Type Casting • Boxing & autoboxing array & strings • Concept of Arrays • Array Declaration, Construction and Initialization • 1-D Array • Array of Objects • 2-D Arrays 	4	1 0
Unit 5 String Handling and Exception Handling	<p>String Handling</p> <ul style="list-style-type: none"> • Understanding String class. • Methods of String • String buffer & string builder exception handling • What is Exception? • Difference in Exception and Error • Using try....catch • Using throws for handling Exception • Making our own Exception • Difference in throw and throws 	3	1 0
Unit 6 Package and Deferred Implementation	<p>Package</p> <ul style="list-style-type: none"> • How Java Library uses Packages • Import statements in Java • Creating our own package • Making Jar Files <p>Deferred Implementation (Abstract Class and Interfaces)</p> <ul style="list-style-type: none"> • Abstract Class • Working with abstract class and abstract methods 	4	1 0

	<ul style="list-style-type: none"> • Interfaces • Abstract Class vs Interfaces • Multiple Interface Implementation • Generalization using Interface 		
Unit 7 Java I/O	<ul style="list-style-type: none"> • Working with File Class • Reading and Writing with Disk Files • BufferedReader and BufferedWriter • Object Serialization • Scanner class 	3	1 0
Unit 8 Thread, Generics and Collection	<p>Thread</p> <ul style="list-style-type: none"> • Defining Threads • java.lang.Thread and java.lang.Runnable • Thread States • Thread Priorities • Synchronization generics & collection • Defining Generics • Generics Methods • What is Collection API • Difference in Arrays and Collection • List(ArrayList, Vector and LinkedList) • Queue(PriorityQueue) • Map(SortedMap) 	4	1 0
		30	80

Reference:

1. OCA/OCP Java SE 7 Programmer I and II Study Guide: Kathy Sierra and Bert Bates
2. Programming with Java, A Primer: E Balagurusamy
3. Head First Java, Second Edition: Kathy Sierra and Bert Bates

Lab: Computer System Architecture (CMP710)

Practical No.	Activities
1	Identify and draw the motherboard layout of Intel i3 processor and understand connection and layout of the H67 or P67chipset
2	Perform Basic Input/output System (BIOS) setting and configuration setup using Complementary Metal Oxide Semiconductor (CMOS).
3	Format, partition and install a Hard Disk Drive (HDD) and format a pen drive.
4	Understand layout, characteristics and functions of different components of Hard Disk Drive (HDD) as a storage device.
5	Install Video Graphics Array (VGA) or Super Video Graphics Array (SVGA) display cards.
6	Install and understand the working of printer.
7	Install and understand the working of Input/output devices such as scanner and modem.
8	Connect Switched Mode Power Supply (SMPS) and identify different parts of SMPS. Understand the working of SMPS and Uninterrupted Power Supply (UPS).
9	Use diagnostic software to identify installed computer peripherals and test their working condition.
10	Find faults related to Monitor.
11	Find faults related to CPU.
12	A Find faults related to Hard disk.
13	Find faults related to Printer and other peripherals.
14	Form a pico net using Bluetooth devices and transfer data.
15	Assemble PC and install an operating system.

Lab: Software Engineering (CMP711)

Practical No.	Practical	Activities
1		SRS
2		Justification for selection of suitable model
3		DFD
4		ERD (Use STARUML software)and Data Dictionary
5		Structured Chart
6		Design the input screens for sample project selected
7		Design the output screens for sample project selected
8		Design the reports for sample project selected
9		Cost estimation using COCOMO 1
10		Duration estimation using COCOMO 1 and draw Gantt Chart
11		Effort estimation using COCOMO 1
12		UML Diagrams 1– Class Diagram, Use Case Diagram (Use STARUML software)
13		UML Diagrams 2 – Activity Diagram, Sequence Diagram, Collaboration Diagram (Use STARUML software)
14		What is meant by software testing? What are its types? Which are the tools used for testing?
15		What is meant by quality assurance?

Lab: JAVA (CMP712)

Practical No.	Practical	Activities

1		<ul style="list-style-type: none"> i. Write a Java class to swap two numbers without using third variable. ii. Write a Java Program to determine reverse the number iii. Write a Java class to print the Fibonacci sequence till 100 iv. Write a Java Program to determine whether the number is Armstrong or not. v. Write a Java Program to determine whether the number is prime or not.
2		<ul style="list-style-type: none"> i. Write a Java program for the following scenario: Run a loop from 1 to 100, while looping when the number is even print its square and when the number is odd print its cube. ii. Write a Java program to print the following Floyd Triangle <ul style="list-style-type: none"> 1 0 1 1 0 1 0 1 0 1 iii. Write a Java Program to print following <ul style="list-style-type: none"> 1 2 3 4 5 1 2 3 4 1 2 3 1 2 1
3		<ul style="list-style-type: none"> i. Write a Java class Employee with variables name, age, gender write setter and getter methods for it. ii. Write a class mobile with methods call() and sms(). Write a class Demo and access it. iii. Write a class MathDemo with methods square() with one parameter and add() with two parameters. Call these methods to get the output.
4		Write a Java class for following methods display() -- Display number from 1 to 100 using while loop in Java fibonacci() -- Prints Fibonacci series till 100
5		Write a class Automobile with default constructor, write a class Plane which extends Automobile and has a default as well as parameterized constructor, write a class Airbus with a default constructor which extends Plane.
6		<ul style="list-style-type: none"> i. Write a Java Program to convert "25" to Primitive as well as Wrapper. ii. Write a Java program to convert 110011 to decimal value.
7		Write a Java Program to convert the "59" to Primitive float (without using Constructor of Float)
8		Write a class User with abstract methods pay() and receive(), later make two concrete class GoldUser and SilverUser, override the abstract method.
9		Write a Java program to write the following, class A with method m1() and m2() and write a class B with methods m3() and m4(), Override the methods of A in class B.
10		<ul style="list-style-type: none"> • Write an abstract class Car with methods start() and stop(). Write a class Santro and Audi and override the methods. • Write two interfaces SportsCar and CommercialCar and implement the appropriate interface on the appropriate class made in example 1.

11		<ul style="list-style-type: none"> • Make an Interface CE which have methods call(), sms (), Make another interface ISO which have methods radiation() and sound(). Make two classes IPHONE and Galaxy and make them implement both the interfaces. • Write a Java program to make a package com.shapes, make classes Circle and Square in the same package.
12		<ol style="list-style-type: none"> i. Write a Java Program to make an Exception AgeException. When user passes some age and if age is less than 18 throw this Exception. ii. Create an Exception StringNotPalindromeException. Write a class with method which throws this Exception when String passed is not palindrome.
13		<ol style="list-style-type: none"> i. Write a Java program to determine the number of vowels in a String ii. Write a Java program for separate hours, minutes and seconds from following string 01:23:45 PM.
14		<ol style="list-style-type: none"> i. Write a Java Program to store the following data, in the collection you feel will suite best. Name- Tom Email- tom@gmail.com Phone:9988776655 ii. Write a Java Program to find the minimum value in Vector [8,9,1,3,4]. iii. Write a Java Program to find the number of String starting with „S“ from following TreeSet [Smith, Alex , Tom, Steve, Mark, Sammy]
15		Sort the given list of objects in order of their email Contact: id, name, email, phone